

**Interdisciplinary Artists: The Collaboration of Interdisciplinary
Artists Foster Interdisciplinary Education**

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Abstract

It has been found through extensive studies that students who are proficient in the subjects of Science, Technology, Engineering, and Mathematics (STEM) are more prepared to succeed later in life. But by adding Art into the STEM curricula (STEAM) and creating a far more interdisciplinary framework for educators, students can be even better prepared to solve the world's problems.

This study uses a narrative approach for data collection and interpretation of results by interviewing three interdisciplinary artists. At the beginning, I posed the two main questions:

- 1) How do interdisciplinary artists conceptualize themselves as art educators?
- 2) How can interdisciplinary artists' experiences and understandings inform how STEAM is implemented within art education?

My intention was to learn how these interdisciplinary artists were able to integrate their specific areas into the arts to develop uniquely integrated curricula. Over the course of my research, I determined that there is never one single event that drives individuals to this type of work. Each of these individuals started from a different point that eventually landed them in interdisciplinary education. It was on these separate paths that each person developed a common understanding of their role as an interdisciplinary artist. That is not to say that this path is easy. The jobs of artist, educator, and researcher are constantly in contention with one another, but they must work together to fully succeed.

Currently the role of art in education is treated as an option not a necessity. This is due to the fact that most educators already involved in STEM do not see themselves as artists. In an education system that is based on test scores, this is increasingly hard to prevent. So, in order to create a truly integrative and interdisciplinary education system that is effective and comprehensive as well as helpful and engaging to students, we must use both quantitative science-based subjects as well as qualitative art-based subjects. As interdisciplinary educators, we must correct past mistakes and show that art is a vital part of any and every core curriculum.

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Chapter 1

Statement of the Problem

Evidence has been found that supports the idea that students perform better when they are taught with an interdisciplinary curriculum as compared to siloed curricula, specifically in science, technology, engineering, art, and math (STEAM) education, where the arts are the center of the curriculum (Baxter, 2014; Hetland et al, 2015; Hunter-Doniger, 2018; Stokrocki, 2005; Winner & Cooper, 2000). Utilizing an interdisciplinary curriculum can help students have better learning experiences that can create meaningful opportunities to relate and connect their learning to real life situations, both in and out of school (Beane, 1997; Gettings, 2016; Vars, 2001).

This integration increases the relevance of their lessons in the classroom by making the curriculum more meaningful to students' lives (Hargreaves & Moore, 2000). The implementation of interdisciplinary education encourages teachers to expand beyond their areas of expertise and provides opportunities to create curricula that are more relevant to students (Stolle & Frambaugh-Kritzer, 2014). According to Hannon, Hocking, Legge, and Lugg (2018), interdisciplinarity has become a vital part of contemporary education. They stated "Interdisciplinarity has become part of contemporary university discourses on knowledge in both research and in curriculum-planning" (p. 1424).

The movement towards breaking down traditional disciplinary boundaries reflects newer emerging forms of inquiry into knowledge that are less hegemonic and more evenly distributed, thus making inquiry more attuned to the production, practices, and needs of its practitioners (Seidel, Tishman, Winner, Hetland, & Palmer, 2009). The notions of interdisciplinary education and how it can be effectively utilized in interdisciplinary art teaching and learning are still motivating and challenging art educators and education in society (Consorte-McCrea & Newing, 2015; Hannon, Hocking, Legge, & Lugg, 2018; Ulbricht, 1998).

Hannon et al. (2018) argued that interdisciplinary education may be unsustainable in practice: for instance, conflicts between disciplinary cultures can affect practices. A key challenge in the field of art education is the paucity of studies that indicate precisely what this subject teaches (Hetland et al., 2015). According to Williams (2013), while it is evident that art education involves training students in artistic techniques to be used with different media

and involves students creating artworks using these techniques, the thinking systems developed through art education have not been sufficiently studied, measured or defined.

Consequently, advocates of art education may have less empirical evidence to rely upon when making their case, especially when superficial comparisons are drawn between art education outcomes and the real-world knowledge and skills seen to result from math and science education (Williams, 2013).

Key examples of the lessons derived from art education, lessons that anyone with experience as a student or teacher of art will immediately recognize, have been identified by Eisner (2002) and include the ability to view problems from diverse perspectives, craft multiple solutions and move beyond the restrictions imposed by language. According to Eisner (2002), art education offers students unique educational experiences that enable them to value subtlety and uncover how to employ visual means to express an array of emotions. Eisner (2002) highlighted the value of art education's influence on learning and argued that the skills taught in art classes are unique and thus cannot be gained elsewhere.

While many of the supporters of art education draw a connection between attending art classes and achieving strong test scores, no conclusive evidence has been found to support the hypothesis that art education results in improved test scores (Hetland et al., 2015). According to Chapman (2004), art education advocates are playing a dangerous game by asserting the value of art education based on its ability to improve test scores. Hetland et al. (2015) agreed, arguing that when the teaching of art is justified based on its ability to enhance academic performance in other subjects, this secondary benefit demeans the subject.

Nonetheless, Hetland et al. (2015) also asserted that art education must result in academic improvements if its advocates want to see it promoted. Additionally, the introduction of acronyms, for example, STEM, has been identified as prompting similar results (Williams, 2013). Williams (2013) considered STEM and the teaching of subjects in combination with art as leading to a piling-on effect of subjects all shouting, "rampant me too-ism" (p. 20). There is clearly a need for art education advocates to elucidate the outcomes of this subject in terms of the skills gained by students and to measure the thinking processes and learning developed through participation in art classes (Williams, 2013).

According to Williams (2013), on the topic of STEM to STEAM, art educators in public schools are well aware of the importance placed on other subjects over art. Art educators will also be conscious of the benefits that art education has on other subjects by, for

example, nurturing students' critical thinking abilities and creativity and making students aware of the visual nature of contemporary culture. Responding to the growing popularity of STEAM education, the National Arts Education Association (NAEA) created four STEAM education criteria, which were published in 2014.

These criteria are: "1) all disciplines within STEAM are to be valued equally; 2) diverse approaches are to be implemented; 3) innovation and creativity are to be encouraged; 4) the rigor of visual art is to be acknowledged" (National Art Education Association, 2014, para. 3). The purpose of these criteria is to ensure that artistic thinking processes and the arts generally are deemed equally as valuable as STEM subjects. It has always been a key concern of art educators to establish shared ground with other subjects to justify the inclusion of art within general education. In STEAM education, art forms the core of the curriculum.

Hartle et al. (2015) explained that an art-infusion seeks to fundamentally shift how subjects are both received by and presented to students, a shift that relies on equal and committed collaboration between non-art and art educators. Hunter-Doniger (2018) observed that this approach to teaching can provide students with a more comprehensive understanding of all subjects. Nonetheless, interdisciplinary teaching faces several challenges, such as adequate time to plan, flexible scheduling, ongoing professional training, suitable resources, curriculum mapping, the involvement and support of the community, administrative involvement and access to national, state, and local education standards (Suraco, 2006).

Despite these challenges, researchers such as Beane (1997), Jacobs (1989) and Suraco (2006) identified no reasons that justify separating subjects. The current system affects interdisciplinary challenges in teaching (Hunter-Doniger, 2018; Klaassen, 2018). Each subject must support all other subjects and teachers may feel that they lack the ability to go beyond their area of expertise. To illustrate, the National Science Teachers Association wants to dispense with fragmented high school curriculums and establish an integrated science education program. Non-science teachers, however, are uncomfortable with the idea of teaching outside their area and are unsure how art can be used as the cornerstone of an integrated curriculum.

Suraco (2006) thus argued that teacher training must be reformed to enable them to engage in integrated learning practices. Importantly, Jacobs (1991) identified the planning of interdisciplinary curriculums as the most significant obstacle to integrated learning as teachers inevitably attempt to take on too much responsibility rather than searching for areas

where subjects naturally overlap. For instance, when postmodernism is being taught in history, social studies, art, music and literature can all become involved. When teachers work collaboratively, commonalities are realized, and it is rare for students to be inundated with information on a single topic.

Jacobs (1991) argued that finding overlapping areas requires cooperation and the sharing of curricular ideas and textbooks. However, Suraco (2006) indicated that art teachers often share no common planning time with other teachers such as classroom teachers, hindering the exchange of information. Moreover, for an interdisciplinary art-centered curriculum to be created, the demands of standardized testing, as well as planning time constraints, must be surmounted. Later problems include a lack of collaboration in any follow-up from integrated classes and the completion of separate evaluations for each discipline (Suraco, 2006).

Interdisciplinary approaches in art education, specifically for STEAM education, present many challenges and issues for contemporary practice. For instance, the how, when, where, and why the implementation of interdisciplinary concepts must have been applied affectively and in a way that is coherent, complete, and is appropriate within the context of other subjects (Belardo, 2015; Harper, 2017; Strokrocki, 2005). How to make art content a priority within STEAM and other interdisciplinary approaches is still unclear, especially since educators need to make sure that this interdisciplinary approach is being taught from various disciplines through a wide variety of approaches (Hunter-Doniger, 2018).

One approach, suggested by John Dewey, is progressive education, which emphasizes that students must learn by doing. He indicated that students must interact with the environment in order to relate to reality, with students and teachers having direct experiences. Dewey championed an interdisciplinary curriculum that focuses on the connection between multiple subjects. Students should not only study in a classroom, but should have freedom to explore outside of the classroom in order to pursue their interest. The role of a teacher is best served as a facilitator in order to support students (Thorburn, 2017).

Dewey (1934) argued that art has relevance in day to day life as well as connections to many other subjects. Thus, art has the inherent ability to create purpose and meaning for students, specifically with regards to creating art. According to Hunter-Doniger (2018), “The arts and artistic ways of thinking have equal value as science, technology, engineering, and

math (STEM)... Artistic ways of thinking and visual art content are fundamental and valuable components of high-quality STEAM education” (p. 23).

In addition, she emphasized that educators advocate that art can truly be the central part of education. Teaching strategies that might aid in students’ engagement are the use of key concepts, content mapping, essential question inquiry, constructive methods and collaboration with classroom teachers. These strategies can make it possible to unite disciplines and develop students' critical thinking (Beane, 1993, 1997; Eisner & Day, 2004; Erickson, 1998; Jacobs, 1989, 1991).

High-quality STEAM instruction requires that art be situated at the center of curriculum (Daugherty, 2013). High-quality STEAM instruction refers to “the use of STEAM curricula and the collaboration of non-arts educators with certified/licensed visual art educators and/or teaching artists, art museums, university art education programs and community-based arts organizations” (NAEA, 2019, para. 1). To achieve the goal of high-quality STEAM, the idea of achieving a goal in interdisciplinary education has to be considered. This can be associated with the implementation of interdisciplinary programs facilitated by artists.

This approach provides interesting perspectives of interdisciplinary practice as Carp (2017) stated: “The creative process as seen through the eyes of an artist gives the course its authentic foundation” (p. 17). Thus, Carp emphasized how artists can develop students’ creativity within an interdisciplinary setting by using critical reflection related to artistic processes. For instance, Carp (2017) dove deeper into the work of artist-teacher Henk Schut, one of the pioneers who helped make Interdisciplinary Artistic Collaboration a platform for artistic research, which could be utilized by graduate students from many different art educational disciplines.

Carp (2017) explained that this experiential education program involved teaching research skills using scaffolding, critical reflection, and the production of research experimentation and questions collectively. In this program, groups conducted work together and then collaboratively reflected on what they had produced to develop insights and share skills. As an inductive method, students had the space to connect their experiences with theoretical frameworks, incorporate insights and make discoveries themselves.

Visual art is naturally interdisciplinary and this understanding is currently embraced by the field of art education (Stokrocki, 2005, p. viii). Hunter-Doniger (2018) emphasized that visual art and interdisciplinary education naturally benefit STEAM education. She stated:

Visual art in an art-infused school is the foundational fiber of the woven tapestry of education. The arts can metaphorically be the weft through which non-art disciplines are woven... Art provides the ideal conditions for science, technology, engineering, art, and math (STEAM) education to be embedded within a curriculum. (p. 22)

According to Rush and Conant (1979), one of the crucial needs in visual arts studies is to understand the nature of excellence in the education of visual artists and how artists achieve such excellence. If art educators encourage artistic modes of thinking and creating, then students can benefit from artists' creative abilities. This way of thinking can be brought to fruition in adults and can benefit them beyond their academic disciplines (Marshall and Donahue, 2014). Marshall and Donahue (2014) argued that contemporary art and contemporary artists have enormous potential to sustain education across subject areas. For this reason, experiences from interdisciplinary artists in the contemporary art world might bring relevant thinking processes, practices, and pragmatic value to interdisciplinary education that might aid in addressing the interdisciplinarity challenges that have never been fully answered.

Purpose of the Study

This study will explore interdisciplinary artists, who work in a variety of contexts and with a wide range of subjects, to understand how they conceptualize their practice and their roles in this process. Specifically, I will analyze interdisciplinary artists' experiences of interdisciplinary art practice by reflecting on and working to understand their lived stories. Moreover, I will consider the possibilities for how these experiences can provide unique insights and perspectives for interdisciplinary education, specifically STEAM, and art education—such as in art space, knowledge production, and creative activity.

In this visual narrative study, I will ask: How do interdisciplinary artists conceptualize themselves as art educators? How can interdisciplinary artists' experiences and understandings inform STEAM (Science, Technology, Engineering, the Arts and Mathematics)? How might interdisciplinary artists' experiences of interdisciplinary arts practice inform how STEAM is implemented within art education?

Definition of Terms

Interdisciplinarity. Interdisciplinarity has been defined as:

Methodology, a concept, a process, a way of thinking, a philosophy, a reflexive ideology. It has been linked with attempts to expose the dangers of fragmentation, to reestablish old connections, to explore emerging relations and to create new subject adequate to handle our practical and conceptual needs (Klein, 1990, p. 196).

According to Dillon (2008), interdisciplinarity “is the most widely used term for breaking out of disciplinary boundaries” (p. 256). Furthermore, Klein (1990) indicated that interdisciplinarity strives for an “integrative synthesis” (p. 188) in the development of approaches to complex problems. The majority of definitions of interdisciplinarity specifically emphasize the integration of knowledge, methods, and modes of thinking utilizing two or more disciplines (Bossio, Loch, Schier, & Mazzolini, 2014; Davies & Devlin, 2010)

Interdisciplinary design. Interdisciplinary design refers to an instructional or method deliberately planned, which utilizes the full range of disciplines in a school’s curriculum (Jacobs, 1989; Mallery, 2000). The Consortium of National Arts Education Associations (2002) defined interdisciplinary education as an approach that allows students to identify and apply connections between two or more disciplines, as well as understand concepts that transcend individual disciplines.

The Consortium of National Arts Education Associations (2002) described three modes of this education, which include: parallel instruction, cross-disciplinary, and infusion. These modes of learning can run the gamut: from single lessons that facilitate connections between two or more disciplines up to a school-wide project that may include many different classrooms, students, and teachers.

Parallel instructors. Two teachers who agree to focus on a common topic or concept are referred to as “parallel instructors” (The Consortium of National Arts Education Associations, 2002, p. 7). Through this framework, teachers from separate disciplines work collaboratively, but focus specifically on their distinct processes and content of their chosen discipline, through their common topic. (The Consortium of National Arts Education Associations, 2002)

Cross-disciplinary. The second approach is referred to as “cross-disciplinary/multidisciplinary instruction,” (The Consortium of National Arts Education Associations, 2002, p. 8), which features two or more disciplines working to address a common theme, concept, or issue.

Infusion. The third and most rare approach is infusion. Through infusion, a teacher’s knowledge and the well-rounded background of the students becomes more critical as “one teacher who has sufficient depth in multiple subjects may be able to teach in this infused manner, but most often a collaborative team will need to be involved” (The Consortium of National Arts Education Associations, 2002, p. 9). An example of this in a high school setting might be an integrative seminar created by the visual arts and language arts teacher (The Consortium of National Arts Education Associations, 2002).

Art-centered integrated learning. Borrowing from Marshall and Donahue (2014), art-centered integrated learning refers to using art thinking to apply knowledge in other disciplines. Marshall and Donahue (2014) summarized art thinking strategies as the amalgamation of logical reasoning and associative thinking. Associative thinking is the process of making connections that either are somewhat logical or perhaps defy conventional logic all together.

Artistic thinking is different from logical reasoning because logic is closely related to the sciences, common sense, and solving everyday problems, while artistic thinking better characterizes arts, fiction, poetry, and creative invention. Logic and associative thinking complement one another in our everyday thoughts and actions: we take our analyses of the world and create our own connections between them. However, artistic thinking allows for more nimble and flexible ways of thinking about profound ideas and concepts.

Art-infusion. Hunter-Doniger (2015) defined art infusion as the empowerment of the arts in education through the usage of three key strategies. The first strategy is that all disciplines are to be treated equally in pedagogy, content and assessment. The second is that collaboration must exist between art and generalized educators, and the final strategy is that the student must be encouraged to go deeper into subjects through the usage of art.

Through art infusion, students are allowed to do more than just memorize content. They are encouraged to search, find, and make their own meaning out of it, which they can apply in ways that interest them (Hunter-Doniger, 2015). When utilized successfully, art

infusion in the classroom creates lessons that are more student-centered. This being the case, students end up with multiple avenues to reach their potentials (Friend & Bursuck, 1999).

Significance of the Study

This study aims to understand how interdisciplinary artists conceptualize their practice and their roles in interdisciplinary education. This study adapts the methodology of narrative inquiry in order to prioritize the voice of interdisciplinary artists that can exemplify different possibilities for interdisciplinary education and STEAM (Clandinin, 2007).

This study is relevant for interdisciplinary educators and art educators who seek to understand the interdisciplinary artistic thinking strategies, and the practical connection between thinking and creating across subject areas. This aspect of the study might assist in making a case for sustaining an art focus in interdisciplinary practices in schools, and developing curricula that are relevant to students in art education.

My theoretical framework in Chapter 2, discusses the concept of interdisciplinary, art-centered integrated, art-infused learning, theoretical concepts, and any aspects that are relevant to my study. Chapter 3 describes my participants' experiences with interdisciplinary arts, the limitations, subjectivity statement, an outline of the narrative paradigm, and design study. Chapter 4 presents the findings, and interpretations thereof. The last section, Chapter 5, is the reflection of the study, as well as the implications for art education and interdisciplinary education.

Chapter 2

Literature Review

This chapter presents the literature review that was conducted to inform the research. The review process used two different approaches. A traditional literature review, which synthesized various selected sources to provide an overview or key points related to the research questions (Efron & Ravid, 2019), was used for the theoretical background. A systematic literature review approach, which included all sources that meet certain pre-selected criteria relating to the research question (Efron & Ravid, 2019), was used for the review of empirical research.

The chapter begins with an overview of the theoretical background of the research, which includes questions such as the history, background, and theoretical models of interdisciplinary arts. Following this theoretical review, the chapter describes the process of systematic literature review used for investigation of the empirical research. The third section of the chapter presents the outcome of the research review, including key findings from the sources selected. A final section of the chapter summarizes the key points of the chapter.

Theoretical Background

Definition of interdisciplinarity. The preliminary concern of the theoretical literature review was investigating a definition of interdisciplinarity as it relates to the arts and art education. One working definition of interdisciplinarity states that “interdisciplinarity involves bringing together distinctive components of two or more disciplines... interdisciplinarity typically applies to four realms: Knowledge, research, education, and theory (Nissani, 1995, p. 121).” This definition is very simple, but at the same time useful, as it delineates the different ways in which the term interdisciplinarity may be used and to what kinds of activities it may apply.

However, it is incomplete because it does not address core questions like what a discipline is. Thus, while a useful working definition, this definition is in many ways too simple. Instead, the question must begin with the question of what a discipline is. A *discipline* can be defined as “thought domains – quasi-stable, partially integrated, semi-autonomous intellectual conveniences – consisting of problems, theories and methods of investigation” (Aram, 2004, p. 380 as cited in Sterling et al, 2010, p. 22). This definition implies that the

discipline is not stable, but is instead changing and evolving over time; therefore, the boundaries between disciplines may change over time (Aram, 2004).

However, as one intensive literature review has shown, there are many different ways in which disciplines can be understood, ranging from the highly specific to a rejection of the very idea that disciplines exist at all (Chettiparamb, 2007). Furthermore, within the context of the American university, disciplines function as institutionalizing structures, and are involved in such social processes as community formation, communication, and flows of power and knowledge (Post, 2009). Although this research uses Aram's (2004) definition of discipline for convenience, it is acknowledged that there can be many different ways of considering what a discipline is.

Understanding what a discipline is allows for a more satisfactory definition of interdisciplinarity. Aram (2004) found that "new knowledge from the confluence, fusion or synthesis of disciplines and new perspectives by borrowing from other disciplines or from the interplay between disciplines" (2004, p. 392) was a generally accepted definition of the concept by interdisciplinary scholars. Another author established a typology of interdisciplinarity, which included a wider range of interdisciplinary activities than earlier definitions (Lattuca, 2003). These activities included informed disciplinary scholarship, synthetic interdisciplinarity, transdisciplinarity, and conceptual interdisciplinarity.

These categories had different interactions between disciplines and scholarship activity. The author also drew a distinction between interdisciplinarity (which aims to synthesize different disciplines) and transdisciplinarity (which is a deliberate boundary-crossing activity) (Lattuca, 2003). Thus, this typology is very useful for understanding the intellectual activity of interdisciplinarity. At the same time, Post's (2009) point regarding the institutionalization of disciplinarity implies that simple interaction between departments at a university may not constitute interdisciplinarity, or may fall more under what Lattuca (2003) defines as conceptual interdisciplinarity.

In this research, the working definition and categories of intellectual activity provided by Nissani (1995) are used. This basic definition is enriched by Aram's (2004) acknowledgement of synthesis, borrowing and interaction between disciplines and Lattuca's (2003) differentiation of types of interdisciplinary activities, to broaden the definition used.

A Brief History of Interdisciplinarity

Although the concept of the discipline has existed in the university since the Middle Ages, the formal concept of interdisciplinarity dates only to the 1930s, when scholars in groups such as the Unity of Science movement began to work on major scientific problems and theories from different disciplinary perspectives (Klein, 1996). However, one author argues that in practice, interdisciplinarity dates prior to the differentiation of natural sciences in the 1800s (Graff, 2016).

The educational reforms of the 1960s, driven by student interest in lowering or erasing boundaries between disciplines and growing concern for practice-based knowledge rather than strict disciplinary lines, led to the establishment of interdisciplinary departments, fields and projects (Chettiparamb, 2007). After the 1970s, the importance of interdisciplinarity became uncertain, according to Chettiparamb (2007). As this author noted, by the 1990s, there were fewer interdisciplinary *programs* than in the 1970s, which implies that fewer students were being trained in interdisciplinary courses or using interdisciplinary curricula. At the same time, interdisciplinary research, theory and courses within established programs in the United States grew (Chettiparamb, 2007).

Thus, between the 1970s and today, interdisciplinarity has become less of an educational movement and more part of the process of academic production within the university. At the same time, there are also contrasting movements within the university, including increasing pressure toward disciplinarity driven by capitalist concern within the university, which has strengthened rather than weakened the boundaries between disciplines (Peterson, 2008). As a result, much more concern within the university is devoted to disciplinary concerns and less to deliberate efforts toward interdisciplinarity (Peterson, 2008). Thus, while it cannot be stated conclusively that interdisciplinarity is less prominent than it was in the 1970s, it could be stated that interdisciplinarity has receded to specific areas which are acknowledged to be of concern in multiple disciplines.

One of the problems of understanding the history of interdisciplinary academic activities is that, as Chettiparamb (2007) noted, focus on interdisciplinarity has occurred predominantly in a North American context. Thus, while a lot is known about (mainly) American modalities of interdisciplinarity, little is understood about the rest of the world (Chettiparamb, 2007). Another problem is that historic understanding of interdisciplinarity is poor, and it is routinely considered to be a modern development rather than a historic trend

(Graff, 2016). Thus, while the history of interdisciplinarity may seem straightforward, in fact it is a complex problem.

The Philosophical and Theoretical Basis of Interdisciplinarity

Education and learning. The first theoretical question this research addressed is how to understand education and learning. One of the most basic insights into education and learning is that to be effective, a modality of education must be based on an underlying philosophy that has been carefully developed (Dewey, 1938/1959). As Dewey (1938/1959) argued, neither traditional nor progressive models of education were adequate, because they did not have this underlying philosophical model. Furthermore, both of these types of educational practice did not take into account the importance of experience as a source of knowledge and education (Dewey, 1938/1959). Thus, the first consideration here is what the philosophical underpinnings of integrated education and learning could be and how these underpinnings account for experience.

Another fundamental question that needs to be addressed is: what is intelligence and learning capacity, and how does it relate to education? Gardner's (1983) theory of multiple intelligences acknowledges that intelligence is not just one thing. Instead, he argues that *intelligence* is a human cognitive capacity for problem solving, creation, and novelty (Gardner, 1983). As a result, intelligence under this model encompasses facility with logic and mathematics, linguistic intelligence, spatial intelligence, musical intelligence, bodily (or kinesthetic) intelligence, interpersonal and intrapersonal intelligence, and naturalistic intelligence.

Each of these intelligences can be distinguished from the other, but they are not isolated. Instead, they interact and are developed with each other through different kinds of experiences (Gardner, 1983). Another theorist who contributed to this debate is Bruner (1966), whose experience in early childhood learning noted that intuition, curiosity, and motivation for learning also influence the outcomes of education. He observed that children are typically flexible and robust problem solvers and can handle challenging material if it is presented effectively (Bruner, 1966). Thus, it is not just the individual's core capacity for learning that influence learning, but also how such material is presented to them and the opportunities and motivations they have for learning.

A further question is how these different types of intelligences are expressed as knowledge. Ewens (1992) called for acknowledgement of the role that mediation plays in learning and education. *Mediation* refers to the mechanism through which thoughts are expressed and knowledge is transmitted (Ewens, 1992). As Ewens (1992) noted, any communicative choice is a medium, whether it is language, movement or dance, or a visual medium such as paint or pencil. Thus, to communicate or to learn is not a direct activity, but one that is mediated by the tools used to communicate between individuals. Ewens' (1992) exploration of the work of French linguist Jean Gagnepain points to one of the problems of mediation, which is that in some cases, the medium can interfere with the communication of the message.

For example, he pointed to the problems that some patients have with the use of tools (such as pencils) to facilitate written language in order to overcome aphasia. Culture and language are also channels through which learning is mediated, and which can affect both the perception of the student and that of the teacher (Anzaldúa, 1987; Stokrocki, 2005). The insights that mediation offer for this research include that not all students will be able to effectively use the same communication channel, and that therefore a broader set of tools for student learning is useful.

Finally, there is the question of how learning should be integrated. Several educational theorists have argued for interdisciplinary and integrated learning under various theoretical positions. Dewey (1959) argued that learning within 'subjects' is not sufficient, as experience typically does not fall into these neat boxes. Instead, opportunities must be given for students to cross lines and develop experience, which can only be done through integration of these different subjects (Dewey, 1959). This call for integration or 'blending' of the traditionally separated subjects has also been undertaken by various other educational theorists.

Tyler (1949), who developed his guidelines on curriculum and instruction following investigation of performance of secondary students in the 1930s, advocated for blending of materials along horizontal lines of thematic association, rather than isolation in individual subjects. This approach enabled students to learn more easily and led to higher performance compared to students whose instructors used learning in isolation (Tyler, 1949). Bloom (1956) developed his *Taxonomy of Educational Objectives* following Tyler (1949). This

model also advocated for the linking and blending of educational content across subject lines (Bloom, 1956).

Bruner (1966) proposed a spiral education model, in which structure, readiness for learning, intuitive thinking, and motives for learning are developed over time, with information provided and linked to earlier stages in learning. This integration across both subjects and educational stages enables the student to retain more of the content they have learned (Bruner, 1966). More modern learning and instructional models, including the integrated thematic instruction model (Kovalik & Olsen, 1994) and *Curriculum 21* (Jacobs, 2010), have taken up these theories and employed them in practice. Authors have also pointed out that failing to integrate subject material can actually harm the development and learning activities of individuals (Beane, 1998; Jacobs, 2005).

In summary, this research uses the theoretical insights of Dewey (1959), Gardner (1983), and Ewens (1992) to acknowledge that integrated learning across disciplines is essential for learning through experience and for overcoming problems of education. It also draws on curriculum and instruction theories from Tyler (1949) and Bloom (1956), which have been the basis of modern integrated learning theories (Jacobs, 2010; Kovalik & Olsen, 1994), to acknowledge the educational power of thematic integration of learning experiences rather than isolation in individual subjects. Following this discussion, attention turns to the theories and philosophies specifically underlying integration of the arts.

Arts-centered integrated learning. The visual and performing arts have historically been one of the main mediums for integration of learning across curricula (Suraco, 2006). This has included not just integrating arts knowledge and practices with other subjects, but also using the arts as a medium for creating connections between different subjects (for example, between scientific and literary subjects) (Suraco, 2006). Art-centered integrated learning also has the power to develop understanding and deep knowledge of subjects, not just isolated factual learning (Marshall & Donahue, 2015). In brief, arts-centered integrated learning offers the opportunity to not just investigate activities within boundaries, but to permeate and overcome these disciplinary boundaries (Klein, 1996).

As a result, art-centered learning has potential value across the curriculum, including natural and social sciences, writing, literature and history, and mathematics and logics (Marshall & Donahue, 2015). Thus, there are some significant justifications for the centralization of art in integrated learning. However, this does not mean that this has been a smooth or effective integration or that integration of arts and so-called ‘academic’ subjects has been easy or complete.

Through a succession of educational regimes in the United States, there have been observations and critiques that the arts have not been supported as an educational priority, which has affected the integration of the arts into other curricular subjects. One author observed that in an environment where resources like funding and arts teachers are constrained, it is easy for interdisciplinary arts instruction to lose integrity, prioritizing the demands of the integrated subjects while losing sight of the objectives of arts education (Roucher & Lovano-Kerr, 1995). Thus, even though interdisciplinary teaching of the arts does have value, for example incorporating cultural and historical context into art, it also poses danger for the primary objectives of arts teaching.

Another author a few years later sounded the alarm about the continued deprecation of arts teaching in American schools under the No Child Left Behind (NCLB) curriculum regime (Chapman, 2004). As this author noted, the curriculum standards under NCLB, which prioritized test performance in basic subjects and focus on STEM materials, did not leave room in the curriculum for the less regimented teaching of arts. Thus, the arts were often abandoned, or in some cases relegated to a supplementary ‘interdisciplinary’ role in teaching what were considered primary subjects (Chapman, 2004). Often, art integration may be superficial, despite the importance of substantive integration of art for successful development of understanding (Marshall, 2006).

The charter school movement, which took hold during the late 2000s and early 2010s, exacerbated this problem, in some cases abandoning arts entirely (Tanner, 2013). Thus, despite the apparent benefits of interdisciplinary arts teaching, it has struggled to retain prominence in an educational regime that has been increasingly test-focused. It has also struggled with the formulation of a consistent theoretical framework or understanding, although two authors have attempted to develop a theoretical model of art-based learning founded on art integration as a transdisciplinary activity (Marshall, 2014; Marshall & Donahue, 2015).

In summary, even though the visual and performing arts seem to serve as an ideal medium for integration of educational themes between subjects because their capacity for developing understanding, in practice this has been rocky in American education. There are several reasons for this, of which perhaps the most significant is the successive devaluation of arts education itself through a period of educational reform. In the following sections, attention turns to the empirical observation of integration of the arts with STEM subjects (sometimes called STEAM or Art+STEM), which is a specific case of arts integration reviewed in this research.

Literature Review Process

Following the definition of the research questions, a systematic literature review was conducted to investigate the state of the literature on interdisciplinary arts. The systematic literature review is designed to be an exhaustive review of the academic literature on a research question within certain parameters (Efron & Ravid, 2019). The process of conducting the systematic literature review included definition of the research question, establishment of inclusion and exclusion criteria, identification of search databases and search parameters, and selection and assessment of the sources available (Jahan, Naveed, Zeshan, & Tahir, 2016). However, given the methodological diversity in the studies that were selected, the choice was made not to follow through to a quantitative meta-analysis. Below, the inclusion and exclusion criteria and search process are explained.

Inclusion and exclusion criteria. Inclusion criteria were selected to ensure the quality and currency of sources included. These criteria included that papers must:

- Have been published within the past 20 years (2000-2020) to ensure currency;
- Have been published in a peer-reviewed journal to ensure minimum source quality;
and
- Have an empirical research component to ensure relevance.

There were also some exclusion criteria that were selected, once again to ensure that the sources were reliable and consistent and that the researcher could interpret them adequately. These exclusion criteria included that papers:

- Consisted primarily of an introduction or opinion article;
- Were not published in English or only partly published in English; or
- Have been retracted or substantially corrected.

Databases and search terms. There were several databases used for the literature search, in order to avoid bias stemming from only accessing a single publisher (Efron & Ravid, 2019). These databases included JSTOR, EBSCOHost, Taylor & Francis, Oxford Journals and ScienceDirect. Google Scholar was also used as a final database, as it has access to other journal sources that were not included.

Table 1 summarizes the search keywords that were used for all databases. Search keywords were used individually, then in combinations of two and three. Following the search process, the selected articles were organized and duplicates were removed. Then, the articles were reviewed for the criteria above.

Table 1 Search keywords

Arts integration	STEAM
Integration with [the] arts	STEM + Art
Interdisciplinary integration	Interdisciplinary arts teaching
Interdisciplinary learning	Interdisciplinary curriculums
Transdisciplinarity	Art integration
Visual arts	Interdisciplinary
STEAM teaching	Arts infusion

Research Review

STEAM education. Integration of teaching of the Arts with Science, Technology, Engineering and Mathematics (STEM) has been termed “STEAM” (Radziwill, Benton, & Moellers, 2015, p. 1). As these authors have noted, the purpose of STEAM education is to reframe the technical learning practices of STEM as an exercise in empathy, developing students’ understanding of the human side of their chosen profession. Art, which can be viewed as participatory, dialogic, and interactive, contrasts sharply with traditional STEM teaching methods, which are non-interactive monologues (at least in part).

By incorporating art into the STEM learning process, STEAM encourages students to think about the meaning and emotional power of their work and how it will contribute, as well as to think through the ethics of the work (Radziwill et al., 2015). Another contribution of STEAM education, according to one author, is that the inclusion of art encourages the creative and critical thinking skills of students, which are ultimately essential for students to become innovators and problem-solvers (Maeda, 2013). Thus, the development of STEAM can be viewed as essential for the ultimate success of STEM. However, little attention has been paid to the importance of STEM for the arts, which is a surprising oversight which would seem to confirm existing concerns about maintaining the integrity of the arts under conditions of integrative teaching of the arts (Roucher & Lovano-Kerr, 1995).

Ultimately, STEAM is a relatively new idea. One study found only 44 published articles on STEAM between 2007 and 2018 (Perignat & Katz-Buonincontro, 2019). This review revealed that the boundaries and definition of STEAM is not yet settled, with a range of definitions and practices being promoted under the field. Furthermore, there is not yet an established framework for performance or outcomes in the purported benefits of STEAM education (including arts education, creativity and problem solving capabilities) (Perignat & Katz-Buonincontro, 2019). Thus, although STEAM is a seemingly straightforward concept, it is far from settled in the literature and more work on the concept remains to be done.

Furthermore, it may have limited high-level engagement from supporters, which can limit the extent to which it is implemented in the curriculum (Mote, Strelecki, & Johnson, 2014). In the following section, student and teacher perspectives on STEAM are reviewed. However, what is missing from the literature is the artist’s perspective, particularly artist-as-researcher rather than artist-as-teacher, with only a few studies addressing this perspective. This is a question that is taken up in the primary research.

Student, teacher and artist perspectives on STEAM. One artist has explained the rationale for STEAM from a competitive and artistic perspective (Bailey, 2015). As Bailey (2015) noted, the inclusion of the arts into STEM can help promote the competitiveness of the US science and technology-based industries, as it promotes effective and creative problem-solving. As he noted, companies engaged in innovation and scientific research frequently draw on the arts to understand problems and solve them effectively. Thus, from a corporate design perspective, STEAM is a desirable teaching model that can help students learn the full set of tools they need to be effective in STEM fields (Bailey, 2015).

However, as a review of studies on the implementation of STEAM in the classroom (below) shows, this may not be as effective in practice as in theory. While many of the studies reviewed focused on K-12 education, there were also some studies on university education. Most studies focused on teacher perspectives, with limited insight into student or artist perspectives.

One study investigated the collaboration of student teachers and artists from a British university in the United Kingdom to develop an educational performance for the primary level (Overton & Chatzichristodoulou, 2010). The students in the study viewed the project as experimental, with a focus on teaching rather than simply entertainment. The students working together also learned a lot from each other, although there were conflicts relating to questions like different epistemologies and concepts of what the project should be like.

Ultimately, the students developed the storyline of the performance, but the performing artists found that there were various problems with the performance. Thus, this experience showed that development of artistic performances was an exercise in collaboration for both teachers and artists, who had to reconcile different ideas about both the content of the project and how it should be performed (Overton & Chatzichristodoulou, 2010).

One editor argued for STEAM in K-12 education as a way to broaden the creative horizons of students and their ability to find solutions that do not fit a single mold (Rolling, 2016). As Rolling (2016) noted, “the art studio is one of the very few spaces in school or society where widely divergent outcomes are encouraged and never-before-imagined design solutions are valued.” (p.4). Thus, integration of arts with STEM (or STEAM) is a critical tool for the development of diversity of knowledge and problem-solving skills.

Rolling (2016) relates his experience with integration of art into the STEM curriculum at the primary level with a Hands-on Land Forms project, in which children drew imaginary landforms incorporating their geology lessons. He argued that his own experience as an artist helped in facilitating the project, because it offered him the correct tools to assist students in achieving their goals. Thus, the main takeaway from this project is that teachers in a STEAM classroom or using a STEAM curriculum may need to have artistic experience themselves, in order to fully integrate the arts component of the project.

Another study also investigated the practice of STEAM teaching (Herro & Quigley, 2017). These authors followed 21 middle-school teachers in mathematics and science classrooms, who undertook professional development training for STEAM integration. They found that teachers implementing STEAM programs typically had to increase their knowledge of the arts in order to effectively implement the program. This is a seemingly self-evident finding, but it is a problem that is often not considered in the literature on STEAM, which assumes that teachers will be team-teaching or otherwise implementing programs with multiple teachers and artists.

However, as this study found, teachers are often on their own in STEAM implementation, requiring them to have the artistic skills. The author did find that the teachers involved in the study viewed STEAM as an important classroom and curriculum focus. At the same time, their study points to the critical issue of collaboration between teachers and artists, without which STEAM programs cannot be effective (Herro & Quigley, 2017).

Another study on STEAM teaching also showed the importance of personal artistic knowledge and development of this knowledge in the ability of teachers to implement effective STEAM programs (Henriksen, 2014). This research, which was a profile of an exceptional STEAM teacher, showed that ideally, teachers should have knowledge of a range of different art forms (Henriksen, 2014).

Although many studies did not attempt to develop a strong theoretical foundation, one author's discussion of art infusion did offer a somewhat stronger theoretical focus (Hunter-Doniger, 2018). This author stated that "art infusion places the arts on equal ground with all disciplines in order to enhance the learning of each and is realized through equal assessment of the arts and non-art material (Hunter-Doniger, 2018, p. 23). The author did identify several

key lessons from her case study, including taking time to value arts, encouraging buy-in and collaboration, and reinforcing rigor of arts projects (Hunter-Doniger, 2018).

However, it should be noted that this is accomplished through the application of the same assessment standards for the arts component as for the remainder of the STEAM subjects, which could be highly problematic given that the value of integrating the arts is that there is not a single ‘right’ solution, and instead students are forced to find their own creative solutions. Thus, this implementation of arts integration once again threatens the fundamental integrity of the arts under this model, as noted by earlier authors (Roucher & Lovano-Kerr, 1995).

At the postsecondary level, one study examined the implementation of a STEAM curriculum at SUNY-Potsdam, which was undertaken by an interdisciplinary team of faculty members along with industry support (Madden et al., 2013). The objective of this program was to develop student creativity and multidisciplinary learning models and understanding. The resulting program was a fully customizable program including an interdisciplinary major with an integrative core of multidisciplinary learning, internship, and general education requirements.

This program is an interesting development of interdisciplinary majors. However, it should be noted that the programs are not truly transdisciplinary; that is, students assemble their majors from different disciplines (including but not requiring the arts), but horizontal thematic integration (as proposed by Tyler [1949], Bloom [1956], Dewey [1958], and the like) does not feature in the program. Thus, this could be considered what one author termed “conceptual interdisciplinarity” (Lattuca, 2003, p. 7), which does not have a clear focus or justification.

A study of student participants in STEAM-based curricula showed that in general, students responded positively to these programs (Ozkan & Topsakal, 2017). These authors investigated perceptions of STEAM activities in a seventh-grade classroom. The interviews with students found that the students had positive perceptions and few complaints about the projects. They also found that students had a positive view of their learning experience during the project. However, they also found that there were some difficulties, including problems with the materials (which were sometimes unfamiliar, for example modelling tools) and lessons that were too short to learn the content from the material.

Furthermore, the comments showed some disagreement between students; for example, some students would have preferred a longer introduction, while others wanted to start with the activity. This is consistent with the theory of multiple intelligences (Gardner, 1983), as students may have more or less facility with the different aspects of the study. Thus, although this study did show that the students had generally positive responses to the program, it also showed that coordinating the projects and meeting the needs of individual students could be very difficult.

A relatively rare study investigated the experience of art students in transdisciplinary learning environments and spaces (Guyotte, Sochacka, Costantino, Kellam, & Walther, 2015). These authors, observing that arts students are often viewed as the contributors rather than receivers of knowledge, focused on the experience and learning of the arts students. Their findings showed that the art students, working as part of a group, were encouraged to revise their idea of art as a solitary production process. They also found that art students engaged in this type of activity had their perceptions of creativity and problem-solving challenged by the introduction of practices by the STEM students with which they worked.

Finally, the students were challenged by their understanding of the process of creating art and how it influenced the final output (product) (Guyotte et al., 2015). Thus, this study showed that artists are not just the contributors in a STEAM program, but can learn and develop along with their STEM collaborators. This is an important insight given that much of the literature has focused on the importance of arts for STEM, but little has considered the other direction.

The main perspective of interest in this study is that of the artist-as-researcher (as opposed to artist-as-teacher or teacher-as-artist, as discussed in the majority of studies above). Guyotte et al. (2015) addressed this perspective to some extent, as did Overton and Chatzichristodoulou (2010). However, their studies were primarily concerned with the experience of art and teaching students in terms of internal collaboration, rather than focusing on the activity of researching STEAM. One of the reasons for this lack of focus on artist-researchers may be that STEAM is considered to be predominantly a collaborative teaching practice, rather than an active area of research (Land, 2013).

Land (2013) argued that STEAM integration takes place primarily as a collaboration between art teachers and the teachers of the integrated subjects, and he did not articulate a substantial role for art research activities in this collaboration. Another possibility is that there

is a dearth of education as it relates to artist-researchers, as arts are typically treated as a secondary field into another field, rather than arts being the leading field (Klugman & Beckmann-Mendez, 2015).

The result of this is that the integrated field, rather than the arts themselves, may receive more research attention. Perhaps even more importantly, the art educator (who often conducts the research that is presented in the literature) is sometimes not viewed primarily as an artist and may not position themselves as an artist, but rather as an educator (Szekely, 1997). Thus, it is not simply the case that artist-researchers do not exist, but rather that they may not be recognised as such. However, there have been some authors that have investigated the specific role of the artist-researcher in arts integration, and whose findings have contributed usefully to the understanding of arts integration and the development of STEAM.

One recent study that assumed the perspective of the artist-researcher investigated the development of a Makerspace within an elementary school (Robinson, 2017). This research was focused on the participation of students in a makerspace over the period of a year, during which time the researcher worked as an artist facilitator within the school. She observed student involvement and the ways in which the makerspace and its use influenced student creativity, problem-solving skills, and, ultimately, performance in the STEM subjects it was used to facilitate. She concluded that the makerspace was an effective tool for developing student problem-solving and creativity within the elementary school context. This research was enriched by the researcher's role as artist because she was able to investigate both the students' academic performance and their performance as creative artists, which may not be obvious to an observer without artistic training. Thus, this study both demonstrates its particular outcomes and the importance of the role of the artist-researcher in the STEAM classroom.

Another study used the artist-researcher perspective to investigate project-based learning and the implementation of artistic pedagogies for STEM teaching (Hunter-Doniger, 2018b). Project-based learning (PBL) is an approach used to teach students to address real-world problems using diverse problem-solving approaches, which makes it ideal for the integration of arts-based problem-solving practices. Hunter-Doniger's (2018) recounting of her encounter with PBL as an artist-researcher illustrates both the possibilities and the difficulties of the role of artist-researcher.

As she noted, the PBL approach is consistent with the approach of arts-based learning, but at the same time, her voice was not heard by colleagues collaborating on the development project. Thus, Hunter-Doniger's (2018) account of the experience of artist-researcher identifies another reason why this role may not be commonly discussed, which is that it is not readily accepted within the collaborative activities of the STEAM educational cohort. This is also an issue that should be investigated.

Summary

This chapter was conducted for two reasons. The first reason was to conduct a review of the definition, history and theoretical underpinnings of interdisciplinarity, particularly as it pertains to interdisciplinarity within the field of the arts. The theoretical review showed that the history of interdisciplinarity is relatively short (although the activity of interaction between disciplines is not necessarily so short). At the same time, philosophers like John Dewey, along with work by Bruner, Anzaldua and others, provide a strong theoretical underpinning for the role of interdisciplinarity in the academy and in teaching.

The second reason was to review the empirical literature on interdisciplinarity as it relates to STEAM and interdisciplinary artists. The literature review revealed that there is a need for more knowledge about the perspective of the interdisciplinary artist, specifically the perspective of the interdisciplinary artist as a researcher, and how this perspective informs the teaching and practice of STEAM. This observation was the basis for the research questions. It also focused the research methodology, which is discussed in the next chapter.

Chapter 3

Methodology

The Narrative Paradigm

A researcher must identify and assess the paradigms and paradigmatic assumptions which shape her worldview. A paradigm is a distinct set of foundational concepts or beliefs, and the assumptions that flow from it constitute the framework through which a researcher interprets human experience (Connelly and Clandinin, 1990; Kuhn, 1962). My thinking is based on the narrative paradigm: that humans construct their own knowledge of their worlds through their experience of it, followed by reflection on that experience. Hence, realities are many and subjective. Moreover, as suggested by communication theory, I believe that each person naturally constructs their own reality by telling stories, whether individually or as members of a group.

The current study is framed by the paradigmatic assumptions that follow from these perspectives: that any understanding of the complexities of lived experience must be based on the subjective realities of those who are living it (Schwandt, 1994). One means of gaining such an understanding, particularly in qualitative research, is through stories (Bochner & Ellis, 2003; Carrillo & Baguley, 2011; Connelly & Clandinin, 1996), the primary means of narrative methodology, as these stories yield pictures of real people encountering real-life situations, challenges, and joys (Witherell, 1991). This does not mean a rambling, unstructured telling; indeed, for stories to be regarded as narrative, they must meet the two criteria of coherence and fidelity (Fisher, 1985). As regards the first, the content of the story must be well enough structured for the listener to understand it, while the second requires the listener to trust that the teller is a credible narrator.

The objective of the current study is to investigate the overlap between artistic and pedagogical practices in individuals artist' journeys towards becoming art educators. Scholars have addressed these journeys from a variety of perspectives (Buffington et al., 2016). Among these, Kraehe (2015, as cited in Buffington et al., 2016), an art education scholar, identified teacher thinking, learning, and development, on the one hand, and identity, on the other, as the principal nodes of inquiry while Grauer (1998) and Kowalchuk (1999) emphasize that student teaching is a key stage in the process (Buffington et al., 2016). The

lens employed in this study, namely studying educators' experiences through narrative investigation, will elicit individuals' subjective experiences of becoming educators. The narratives were based on respondents' personal experience, or that of family members, as well as artefacts such as images, diaries, photographs, and objects to which importance and memory are attached (Buffington et al., 2016).

According to Buffington et al. (2016), their study also draws upon the work of philosopher Gilles Deleuze and psychotherapist Felix Guattari (1987). Their work conceptualizes connections among human experiences through an analogy with rhizomes. In botany, a rhizome is a root system in which shoots emerge from the nodes of a single buried stem, creeping along below ground, branching off, and constantly interconnecting to produce new plants. Similarly, according to Deleuze and Guattari (1987), human experience develops in several directions simultaneously, changing the nature of the stem from which it springs—the person—as it travels.

We can use the rhizome model to conceptualize the development of art educators as being less based on a linear chronology of discrete experiences than the sum of the interconnections between them, which may be to do with semiotic chains, the organization of power, social activity, exposure to the arts and sciences, or many other matters (Buffington et al., 2016). All such experiences are constantly in motion, interconnecting among and between themselves, with no beginning or end.

Moreover, all points on a rhizomatic structure can connect with all other points and this huge potential for interconnectedness allows us to conceptualize how the narratives we form from the experiences of different life stages constantly feed into each other: “open and connectible in all of its dimensions; it is detachable, reversible, susceptible to constant modification” (Deleuze & Guattari, 1987, p. 12 as cited in Buffington et al., 2016, p. 331). As Garoian (2011) observed, this characteristic means there are “unlimited possibilities for interpretation” (p. 246) in the rhizomatic model, which has clear value when translated to the understanding of human experience expressed through narrative.

This conceptualization of our experiences as a constantly spreading and morphing map, rather than a linear or hierarchical diagram, leads to Deleuze and Guattari's (1987) framing of humans as ‘assemblages’ of their experiences. Assemblages, too, are protean: as each new experience disrupts the assemblage, it changes and hence a new way of being becomes possible. A further characteristic of an assemblage is that it may become what

Deleuze and Guattari (1987) called “destabilized or deterritorialized” as a consequence of either the passage of time or impact of particular experiences (p. 88).

Destabilization can result in the assemblage being radically changed or even “carried away” (Deleuze & Guattari, 1987, p. 88), or one part invading another and causing significant change. As applied to a study of how people become art educators, the assemblage model shows the mutual, complex, constantly shifting interconnectedness and influence of life experiences, leading to the emergence of a, frequently interdisciplinary, teacher or practitioner.

Study Aim

The aim of the study is to elicit and understand the experiences of individuals at different stages on the journey towards becoming, or being, interdisciplinary artists, educators, and practitioners. Concurrently, it will shed light on how educational art programs can facilitate interaction between disparate groups, both globally and locally.

Specifically, I sought to elicit respondents’ experiences of both success and challenge within the environment in which they practiced, particularly as regards interdisciplinary collaboration, and how they identified and positioned themselves as (interdisciplinary) artists, educators, and practitioners. I did so by interviewing artists who have had experience of working in an interdisciplinary education setting.

Ultimately, I hope that a narrative inquiry into their experiences of art as part of interdisciplinary education will enhance the work of others interested or involved in the field and, in particular, feed into Science, Technology, Engineering, the Arts, and Mathematics (STEAM).

Design Study

Given the aim of the study, I have chosen to conduct research by carrying out a narrative inquiry and then applying a thematic analysis to the data gathered. There are four principal justifications for this study design:

1. First, this selection is underpinned by my belief that humans are natural storytellers, and that to grasp how others view the world it is necessary to hear their own telling of

their lived experiences. Thereafter, it is necessary to clarify what meaning is embodied in their tellings, and how.

2. Second, it aligns with the technique of narrative pedagogy which I have found particularly valuable as both a student and an educator. I generally represent my experiences to myself and to others in the form of stories and believe that coaching people to formulate their own stories in order to position themselves in relation to ideas, lessons, or the experiences of another individual is a valuable teaching skill. Narrative pedagogy is based on the assumption that narrative processes carried out within learning can bring about meaningful change for individuals and groups.

For Goodson and Gill (2011), narrative pedagogy not only allows us to build our own stories but gives us the setting in which we can exchange them with others, and learn from doing so. Obtaining respondents' experiences in the form of narrative will enable me to analyze and present them in a way which constructs new possibilities for interdisciplinary art and education to be practiced. This aspiration is aligned with the work of Clandinin, Pushor, and Orr (2007), who describe how narrative inquiry into pedagogical practices can push educators to re-assess and re-explore familiar ways of working, and open themselves up to new ones.

3. Third, it enables the use of naturalistic methods, whereby meaning emerges from process. The process in this case is the dialog and interaction created through interview with respondents from different educational and cultural backgrounds. While one participant described herself as an interdisciplinary artist and educator, the second self-identified as a transdisciplinary artist and researcher, and the third as a community-based artist and educator, who utilizes environmental studies into her work. All frequently made use of interdisciplinary art as part of their artistic, educational and personal praxis.
4. Fourth, this choice of design can be justified not only by the constructivist framework already described, but by its particular value in eliciting experience within education. Connelly and Clandinin (1990), for example, stated that narrative inquiry "translates into the view that education is the construction and reconstruction of personal and social stories; teachers and learners are storytellers and characters in their own and other's stories" (p. 2). Moreover, the choice of semi-structured interviews reflects the need to employ multiple perspectives, in order to convey the complexity and variety of interdisciplinary praxis and experience.

Participants

The focus of this research is the three respondents, who represent different elements, such as different subject areas and/or art making approaches within the field of interdisciplinary art. Their experiences of these varied elements are intended to complement each other, and give a representative view of the population in the field more generally. Inclusion criteria were that respondents must have had experiences of practicing or teaching art across several different settings, and have had the experience of incorporating at least one non-art topic into art education. The topics integrated into art teaching by the respondents were biology, environmental studies, and communication studies.

The participants were of varied backgrounds: they lived and worked in different locations at considerable distances from each other, and had incorporated interdisciplinary practices into a range of settings, including their own artistic production, their activity as educators, and their personal lives. This range provided narratives of a variety of lived experiences and the interdisciplinary practice of the communities in which each is embedded.

Each respondent was asked to select the location at which interviews were to be conducted according to where they felt most at ease. These locations were an office, a quiet room in the library, and a respondent's home.

Research Questions

The interviews were based on open-ended questions (see Appendix A) aimed to elicit data concerning the respondents' backgrounds, and in particular to understand how each became interested in interdisciplinary practice. I wanted them to talk about what they had found challenging, where they felt they had been successful, how they envisaged their role as part of larger communities, what impact interdisciplinary work had had on their own practice, their consideration of their role in this work, and their transformational experiences in collaborative art. Furthermore, I sought information about the power relationships which characterize interdisciplinary collaboration and what strategies they had used to ensure that their students or other partners were represented. The following research questions were therefore formulated with a view to eliciting thick narratives.

1. How do interdisciplinary artists conceptualize themselves as art educators?
2. How can interdisciplinary artists' experiences and understandings inform how STEAM is implemented within art education?

Research Method

I chose to use qualitative research, specifically by interviewing respondents. Semi-structured interviews were selected for this study, with the researcher using a pre-determined set of five open-ended questions to prompt discussion. Leads generated through the discussion were then further explored. Hence, the interviews developed organically, according to the respondents' answers, with the basic pre-determined topics to prompt further discussion providing an underlying structure.

As the researcher, I was careful to bear in mind that qualitative research is not bias-free. The onus was on me to give respondents enough information about the nature of the study and the methodology without swaying their responses during the data-gathering phase. Thereafter, when analyzing the data, I had to be constantly self-critical, reflecting on my own positionality in regard to the narratives given by the respondents. Furthermore, I had to remember that the narratives, although reflecting the personal lived experience of the speakers, were embedded in the wider social, cultural, familial, linguistic, and institutional context, which added extra layers of complexity (Clandinin, 2013).

Data Collection and Analysis

Data were recorded during the interviews, then transcribed. Both respondent and researcher then reviewed the transcribed narratives. I then analyzed the transcribed data to identify codes, which I classified as themes.

Different methods have been suggested to classify narratives, which may be described as thematic, structural, dialogic, and visual. The first mode of analysis addresses what was said while the second examines how the story was told. The third regards narrative as performance and investigates who it is aimed at, while the last incorporates the analysis of images (Riessman, 2008). Given I was investigating the incorporation of three specific non-art subjects into art education (biology, environmental studies, and communication studies) I considered that a thematic analysis lent itself best to this research.

Narrative Coding

According to Kim (2016), Clandinin and Connelly (1990) described three analytical tools which can be applied to narrative inquiry: broadening, burrowing, and storying and restorying, all of which have been used in this research. In implementing this approach, Czaniawska (2004) cautioned researchers to remain context-sensitive, which I reflected on in

my methods of data analysis. Broadening (or what Mischler [1986] calls “expansion,” as cited in Kim, 2016, p. 207) required me to look at the wider context to the narrative in order to stretch my understanding beyond the description and meaning ascribed to it by the respondent, for example by drawing on my own knowledge of what she described to expand on detail, background, and the respondent’s position within the wider context.

Burrowing requires a focus on specific details within the narratives given, while storying and restorying are used to investigate how the respondent experienced significant elements within the narrative. This requires the interviewer to elicit further information to shape how the respondents’ experience within this particular narrative was shaped by other experiences in other times and places (Kim, 2016).

It is always important during the coding phase to look out for unexpected findings, as these can point up contradictions in the data, have a bearing on the theory which has been adopted, or even require the researcher to redefine the phenomenon under investigation altogether (Bulmer, 1979). My personal experience was that complexity in the data was welcome, as it added to the richness of the results.

Limitations

Certain limitations must be acknowledged. Narratives are notoriously slippery and subject to change. Moreover, given their subjective nature, they cannot be generalized from, and cannot be regarded as objective reflections of a given occurrence but, rather, attempts by participants to make sense of it. As Fisher (1985) pointed out, one assumption of the narrative paradigm is that narrators believe that there was a good reason for the decisions they took: not necessarily a logically good reason, but one grounded in personality or values. These limitations were increased in the present study by the fact that I chose to analyze only certain portions of the narratives collected. Lastly, our respondents were of a similar demographic background: all white, from the same country, whose stable home, social, and professional environments could not be disassociated from their experience of the interdisciplinary practice of art and art education in terms of resources and time, as well as expectations and cultural capital.

Validity

Any researcher using narrative inquiry must be constantly aware of their own positionality and the power relations present during data collection, and take a collaborative approach to the eliciting and retelling of stories. Therefore, I made sure to embed myself within the context of the research in order to create intrinsic connections between myself and my interviewees. The perspectives and voices of the respondents were incorporated through the triangulation of data by means of narrative coding. Furthermore, I am aware that my own perspectives and bias constitute limitations.

Ethics

The nature, purpose, and processes of this study were explained to respondents, all of whom gave their informed consent for participation. Participation was voluntary, and respondents were aware they would receive no direct compensation, but that any benefits from the study would contribute to the knowledge base from which all art educators, whether trainees or practitioners, can draw.

Respondents were told all data would be anonymized, with each participant given a pseudonym. They were also made aware that strict confidentiality would be observed, and that no individually identifiable data would be released, unless the researcher was required to do so by law. I explained that only I would have access to the recordings of interviews and observations, which would be held in a secure place and destroyed two years after the study is completed. Respondents were also made aware that they did not have to answer the questions, and that they could end the interview at any time. Although the risks to respondents were regarded as negligible, there was nonetheless the possibility that recalling memories could cause them to experience powerful and unexpected feelings.

In the next chapter, I describe the significant themes which emerged from data analysis, my interpretations of them, and how they relate to the theory.

Chapter 4

Results and Discussion

The goals of this chapter are two-fold: first, to present the results of the thematic analysis and narrative of artist views, and second to consider how these findings can be synthesized with existing knowledge on interdisciplinary artists and STEAM education. To begin, I present the findings from my analysis. A brief view of the artists' stories is followed by a dive into the questions of the research.

First, artist stories and their emergence as artist-educators and artist-researchers are investigated. Next, I examine how the artists view the interrelationships between doing, teaching, and researching art and among artists, collaborators, and audiences. Third, I investigate how the artists' experiences and understandings influenced their perceived roles in STEAM education and the arts. These primary findings are then synthesized with the findings of previous studies, presented in Chapter 2 (Literature Review), in order to situate their theoretical and pragmatic implications.

Results

Artist Stories

Three artist-educators were interviewed for this research. Each of these artists had different stories and experiences. Here, a brief overview of each artist is given, to set the scene for their experiences and insights. As these examples show, even though in many ways the artists interviewed are very similar, they have a range of interests, experiences, and perspectives not just on art and its role in society but also on their own role as artists as practitioners, educators and researchers.

Rose. Rose has an educational background primarily in the studio arts, art history, and interaction studies. Her interest as an artist researcher lies primarily in media and communication studies. As an interdisciplinary artist, she works in the intersection between the visual arts, communication and product design.

As an artist-educator. Rose has an explicit anti-capitalist perspective, arguing that capitalism subsumes natural tendencies like curiosity and mindfulness to its own purposes, while suppressing tendencies that direct attention away from consumption. Her educational practices, including Studio Habits of Mind (SHoM) (Gettings, 2016) and project-based

teaching, seek to break this control and encourage the “dangerous” tendencies that capitalism tries to suppress or subsume. As an artist, Rose uses both her static artworks and interactive installations to challenge this hegemony of the capitalist mindset and encourage people to reject its control.

Sam. Sam has an interdisciplinary educational background. Her artist-educator interests lie in community-based art education, public art, art as social practice, and ceramics sculpture. As an interdisciplinary artist-researcher, Sam focuses on community-based art education, using a perspective of localism and environmentalism as the lens for her research. Her major installations, which are large ceramic mosaic murals, focus on ecological awareness and environmental futures, aiming to bring both an awareness of the possible future of human life on Earth and a sense of hopefulness and determination to change these outcomes.

Mr. Frog. Mr. Frog’s educational background is explicitly interdisciplinary and transdisciplinary. His research interest in art and biology is reflected in his area of professional experience, which is heavily oriented toward biology, ecology and interdisciplinary and community-based art. His interdisciplinary role is predominantly as a transdisciplinary artist-biologist and researcher. His work is driven by environmental activist concerns, including ecological research into the effect of anthropogenic activities on human lives and ecologies. His participatory science programs use art as a way of representing the impact of humans on other species, through which he aims to encourage social values of care for the environment.

Emerging As an Interdisciplinary Art Educator

All three artists were trained primarily as artists, although Rose studied interaction studies, Mr. Frog studied biology, and Sam studied art education. This raises the question of how these artists emerged as artist-educators, a role which typically came before artist-researchers. This question is not a single question, but instead emerges as two parts. First, how did the artists find their way to interdisciplinary work? Second, how were they able to engage with interdisciplinary work?

“My epiphany moment that led me to forever be an interdisciplinary artist was when I decided Jackson Pollock and data visualizations had a lot in common.” (Rose Interview, 2019, line. 390-391)

There was no shared moment when the artists emerged as interdisciplinary artists or art educators. Instead, each artist negotiated their own path through art and their specific areas, with interest emerging at different points within their lifecycle and from different interests.

For Rose, interest in art came first, with her interdisciplinary perspective emerging as she grew more interested in patterns and pattern recognition. Her interest in patterns, which she focused on in early projects on gaze tracking, led to the exploration of computing technology as a medium in which she was already in the process of training as an artist.

For Sam, although she was mainly oriented toward nature and the outdoors as a child, she “understood the world in visual, creative ways” (Sam Interview, 2019, lines. 21-22). As she matured as a teenager, she says, she came to an understanding that she did not have to train as a scientist to have an appreciation for the natural world. Thus, she chose primary education as an artist, which she used as a medium to express her interest in the natural world.

For Mr. Frog, the path toward interdisciplinary arts was different as his primary interest was biology, specifically ichthyology research (the study of fish and amphibious vertebrates). He was a highly creative and visually oriented child but chose to focus on science. As a result, he began to use art as a tool to communicate about his primary interest in science. It is very difficult to generalize a single experience from these different experiences, except in the broadest strokes: the artists had an interest in both art and their specific areas, which at some point coalesced into an understanding that these were complementary modes of knowledge that could be usefully integrated.

“Having the art education degree gave me the tools to transform a studio art practice and a pedagogical practice into something that happens outside of the classroom and outside of the studio.” (Sam Interview, 2019, lines. 562-564)

The process of emergence into a formal role as an artist-educator and/or artist-researcher was also highly individualized between the participants. There is no single path

from formal education to the multifaceted role all three artists share, nor even a common starting point or end point.

Mr. Frog, who is primarily a science educator, has used his science facilitating roles as a vehicle for his art. To him, the process of merging his roles as artist and facilitator has been a process of trial and error:

“You’re constantly trying something, and a lot of the time it’s a failure. But that failure is important because it’s teaching you something each step of the way.” (Mr. Frog Interview, 2019, lines. 463-465)

Thus, his process of emergence as an artist-educator and artist-researcher has taken place within the context of how he has developed as an educator and researcher, with art used as one of the tools of trial and error. Today, Mr. Frog still works primarily as a science facilitator who uses art in teaching science, rather than as a studio artist.

Sam, on the other hand, trained primarily as an artist, and initially engaged in studio art while she tried to find a job as an art teacher. As she explained, her artistic specialty of ceramics and relative rarity of art education jobs meant that it took her a long time to find a formal job in art teaching. However, she credits her role as a studio artist, which included several large and transformational projects, with preparing her for art teaching and research.

This preparation included not just development of artistic skills, but also skills in coordination, seeking funds, and engaging stakeholders and public bodies in art. Thus, by spending a period of time as an independent studio artist engaging in large community projects, she was able to eventually grow into a role as a community art educator.

Rose, who alone among the artists has formal training in education, has had yet a third path toward her emergence as an artist-educator and artist-researcher. As she explained, she began her education with the initial goal of becoming an artist-educator and pursued a formal role in this area during her education.

As a result, alone among the participants, she had already established an artist-educator self-concept and formal role, through extensive work with a single organization. This means that rather than beginning from a scientific perspective like Mr. Frog or the perspective of a studio artist/community artist like Sam, Rose always considered herself to be an artist-educator. Her emergence has been less a becoming, therefore, than a continued state of being, in which she refined but did not change her identity.

The Tension Between Creating, Teaching and Researching Art

“The primary goal of art... is to educate” (Mr. Frog Interview, 2019, lines. 20-21)

One of the most fundamental questions was, how are creating art, teaching art and researching art conceptualized as activities? The perception of the artists was that these were separate, but interrelated, activities.

There are several oppositions that the artists drew between creating art and teaching art. *Creating* art was an emotional and psychological practice, while *teaching* art was a pragmatic and didactic practice. The practice of creating art, according to Mr. Frog, was a process of interpretation of one’s own experience, followed by the presentation to others for their own interpretation. In this role, exhibition of the completed object or installation was essential, since it was exhibition that enabled the re-interpretation by viewers.

In contrast, the practice of teaching art involved not just the teaching of artistic techniques, but also teaching students how to interpret their own experience. In terms of teaching, exhibition was important not for the direct encounters between the artist and the viewer, but to enable students to have their own encounters. Furthermore, while the creation of art was a process of planning for the creative process itself, in teaching art, the artist needed to prepare materials for the teaching of how to create, developing lesson plans and projects that were appropriate for the community they would be teaching.

The role of artist-educator is also manifest, focused on the planning and integration of the art itself and the teaching activities and community. At the same time, as Mr. Frog explained, the role of the researcher was very open, with few limitations on what could be addressed or how it could be addressed. As he observed, the mere fact that interdisciplinary research has not been well-developed left a lot of latitude for researchers to engage creatively with their areas of interest.

At the same time, the roles of artist, educator and researcher are holistic, interactive and interdependent. Mr. Frog noted that without the experience of art production as an artist, it would not be possible to teach art as a practice. At the same time, Rose explained that her art practice came from her experience as a designer, researcher, and educator – these experiences were part of what she interpreted in her art.

Finally, as Rose pointed out, her art on its own was not necessarily the sort that generated high sales; instead, her art served as the basis for her value as a teacher and researcher. Thus, even though these roles are distinct, they are also interdependent to a large extent, with art, teaching, and research roles all drawing on each other and feeding into each other.

Sam explained the tension and interdependence between these roles in terms of Sam's Project One, which was a community art project centered on the natural history and ecology of a local creek. As she explained, as a researcher, she was involved in the grant writing and planning for the project, contacting and engaging with stakeholders like senior citizens' centers and the county to seek support and funding. As a teacher, she developed and delivered lesson plans to the children involved, facilitating their ability to use art as an emotional expression.

Her role as an artist was to brainstorm ideas with others, facilitating the creation of an overall structure and design. As she explained, this project did not result in an unadulterated expression of her own artistic image, but instead as a collaborative effort that explored the ecology and social history of a creek from the perspectives of participants and others engaged in the project. Thus, she played multiple roles in this project, but perhaps the role of artist was the most limited – instead, she facilitated the ability of others to undertake the artist role through teaching and education.

Engagement and the Role of the Artist and Audience

“When I tell people I’m an artist, people are always like, oh, what medium?... And I’m always thinking, no, that’s the wrong question. The question should be, what’s your art about? What's the subject matter of your art?” (Sam Interview, 2019, lines. 87-91)

Another key insight from the artists is that there are differences between their personal experiences of creating art and the experience of others viewing or learning about it. Sam described this as different levels of engagement with art, which she explained using the following analogy:

“Imagine being shown a picture of a sandwich... Now, imagine seeing an actual sandwich and being allowed to eat it... [now imagine] actually making the ingredients, putting the sandwich together and eating it.” (Sam Interview, 2019, lines. 264-285)

Within this analogy, simply looking at a picture of a sandwich is a low-engagement position, characteristic of a casual art viewer. At this level of analysis, the viewer may be more concerned with the medium and aesthetics, rather than the message of the art. The level of eating the sandwich (medium engagement) is a more critical engagement in the art, perhaps as a student or a participant in a community art project. The level of making the sandwich (high engagement) is that of creating the art, as an artist or researcher.

Ultimately, as Rose pointed out, all of these perspectives are valid, and none are wrong – they simply change how the project is viewed by the individual (and how it can be viewed). Furthermore, as Mr. Frog pointed out, the ways of responding are different: “Some respond more analytically, and some respond more poetically, some respond more didactically” (Mr. Frog Interview, 2019, lines. 264-285). Thus, it is not simply how art is represented, but how it is engaged with and the modalities of engagement, that make a difference.

“As an artist you have your own view of what the meaning behind the piece is, but the way other people look toward it, they’re bringing meaning to your artwork.” (Mr. Frog Interview, 2019, lines. 83-85)

“The more diverse the audience, the more diverse the room, the more diverse the community that is created by the art making process, the better.” (Sam Interview, 2019, lines. 595-597)

The differing levels of engagement occur within the interaction of individuals and groups, where the artists (acting as artist, educator, or researcher) find collaborators and negotiate the structure and meaning of the project through these interactions. These negotiations may be influenced by the level of engagement, the visual literacy of the participants, and the different ways of thinking about art and its role.

In some cases, as Sam explained, these structures may be heavily siloed, with strict rules about what the rules for engagement are. Ideally though, according to Mr. Frog, the collaborative art project should be a collective action for shared ends, through which people get to know each other through the process of collaboration.

Furthermore, the art project should invoke a form of call and response between the artist(s) and viewer, building on both of their experiences. In Rose's eye-tracking project, one of her earlier installation pieces, the viewer actually became part of the project, with eye-tracking cameras used to collect data from viewers. In essence, as the viewer looked at the artwork, the artwork was in turn gazing back, and the feedback generated from this gaze was used to enhance the artwork. Thus, the exchange between the artist and the audience, though it may be mediated, is neither one-way nor passive. Instead, the artist-educator-researcher creates a scaffolding or framework for the use of others, but the gaps are filled in by the creativity of other participants.

Sam pointed out that diversity of both project groups and audiences improves the artwork, with different viewpoints resulting in a richer, fuller artwork and a better body of interpretations. Students, community members and other participants become not passive knowledge recipients, but collaborators, who contribute their own skillsets to the evolution of the project's idea. Rose characterized this interplay between artist(s) and audience as a cycle of exchange, in which the artist(s) and the viewers engage in thick communication and exchange of knowledge and experiences through which both benefit. Thus, while the roles of the artist(s) and others are different, they are also interdependent and interactive, with both the artists and audience benefiting from this exchange of ideas.

The Role of Art in STEAM Education

"The problems we're facing are not science problems, they're not art problems. They're human problems, right?" (Mr. Frog Interview, 2019, lines. 334-335)

The artists agreed between themselves that art and science/the environment/interaction studies are not truly distinct modes of knowledge or being. Instead, they are different perspectives on the same set of problems. This has many different implications for the artists and what they view as the role of art in STEAM education. First,

biology can serve as a medium for art. Sam's project (Sam's Project Two) illustrates this relationship.

In this project, she created objects which served as colonization surfaces for fungi, lichens and other indicator species in the natural environment; the artwork itself then emerged as these species took hold. Thus, this artwork represents an interaction between science (the environment) and art, in which science is used to create art.

The counterpoint to this argument is that art serves as a problem-solving vehicle, as explained by both Mr. Frog and Rose. For example, art can be used to investigate possibilities, as in Rose's work on anthropogenic futures and climate change, or Mr. Frog Project One, which literally remove extinct species from the picture.

Art can be used to make abstract systems tangible and observable or satisfy the "human desire to find order" (Rose Interview, 2019, lines. 415-416). Thus, science/the environment/interaction studies serves the purposes of art – but art also serves its own purposes. In a truly interdisciplinary or transdisciplinary perspective, both are subsumed to the greater purpose of, as Mr. Frog noted, solving the problems of humanity and the wider world.

"It's not about meeting a certain requirement or goal. It's about instilling curiosity and critical thinking." (Rose Interview, 2019, lines. 155-157)

Another aspect of art's role in STEAM is that it is intended to offset the focus on requirements and results that is assumed within STEM. As noted above by Rose, the fundamental orientations of art and STEM are different: qualitative versus quantitative, understanding versus measuring, and so on. Thus, art provides a different way of thinking for students, creating a common language which can be used to communicate with others, as explained by Mr. Frog.

Sam's Project One demonstrated that art also can be used to make ideas accessible and to translate experiences and knowledges to a form that can be understood. If done effectively, this increases the level of engagement from, in Sam's analogy, the image on the page to participation in the creation of the system itself.

Furthermore, this project illustrated that art, like science/the environment, is beyond the ownership of a single person. Instead, art served as a framework for talking about things, as Rose put it – things ranging from the ecology of the stream that was the focal point of the project to the social history of the surrounding area. Thus, art serves as a medium through which science/their specific areas can be made in some sense “real” through engagement and social embedding.

“People outside of the discipline have certain expectations or ideas of what it is to be an artist. And sometimes it’s hard to approach people outside the discipline to collaborate.” (Sam Interview, 2019, lines. 719-722)

A final insight on the role of the artist-educator and art generally within STEAM is that this position is contested. As Sam noted, people have ideas about what art is, and – not seeing themselves as artists – are reluctant to collaborate in STEAM projects. The result of this is that interdisciplinary art within other areas is “always an elective or a side” (Rose Interview, 2019, lines. 528-529), as Rose put it.

Art within STEM is something taught in summer schools, rather than integrated into mainstream lessons. Thus, it remains marginal, with the potential power of art as a medium and a way of thinking limited to the measurement of other areas, specifically to the edges of science. Practitioners like Mr. Frog, who use the arts as a way to talk about other areas, such as science in everyday facilitating and research, are relatively rare as a result of this marginalization of arts.

Discussion

The experience of the artists interviewed as both artist-educators and artist-researchers brings up several interesting points as they relate to the literature presented in Chapter 2. Below, several of these points of interests are discussed. The first of these points are general concerns of educational theory, including the role of the arts in intelligence and learning and the position of arts in STEAM. The third and more personal point relates to the experience of fulfilling the roles of artist, educator and researcher in an interdisciplinary arts environment.

Arts, Intelligence and Learning

One of the most fundamental point is: how is art contributing to learning, in the perspective of the interdisciplinary artists? Art is viewed as another language or mode of learning, in which curiosity and critical thinking are encouraged. This understanding of the role of art can be deepened through reference to the theory of education and learning. At one level, art is a means of developing spatial and bodily intelligence, and its integration into science contributes both to logic and naturalistic intelligence (Gardner, 1983). As expressed by Bruner (1966), art which encourages curiosity and critical thinking is also a natural mode of learning for children, who are naturally creative problem solvers if given the tools to do so. Thus, art serves as a fundamental tool for education.

However, there are more subtle points about art and learning that can be gleaned here. For example, Dewey's (1959) perspective on education relates to the importance of *experience*, which can be considered as an underlying theory of Sam's sandwich analogy of engagement. Dewey (1959) argued that experience, not just didactics, is a crucial source of knowledge and education. In other words, in order to truly learn, it is crucial for the student to do. He indicated that students must interact with the environment in order to relate to reality, with students and teachers having direct experiences.

Dewey also believed in an interdisciplinary curriculum that focuses on the connection between multiple subjects. Students should not only study in a classroom, but should have freedom to explore outside of the classroom in order to pursue their interest. This research has shown that art provides students with the tools for this doing. Furthermore, art serves as a tool for mediation, or the expression of thought and transmission of knowledge (Ewens, 1992). Thus, art is not just a way to develop artistic knowledge, but also a way to gain experiential knowledge. Additionally, art can act as a mediation channel for the student's thoughts and experiences.

The Role of Arts in STEAM Education

Another key issue addressed in this research is the role of arts in STEAM education. The artists who participated here pointed out many *potential* contributions of the arts to STEAM, including its problem-solving, communication, and representation capabilities, its ability to instill and provoke curiosity, and its inherently collaborative nature.

However, they also pointed out that despite these benefits, there are still some significant barriers to arts integration in STEAM, and that arts often end up positioned as an optional extra, rather than a core learning mode or communication channel. This lack of engagement and marginalization has been noted by other researchers, who noted that it is often other disciplines, rather than the arts, that set the terms of engagement (Mote, et al., 2014).

Dewey's (1959) argument that it is only by crossing 'subject' lines that one learns is consonant with Mr. Frog's observation that what STEAM is attempting to solve is neither art problems nor science problems, but *human* problems. Furthermore, Bruner's (1966) spiral education model, in which successive rounds of structure, readiness, intuitive thinking and motives for learning develop on each other, is a useful framework for understanding the interdependence and cycles of learning that develop from the influence of arts and sciences as well as the environmental and experiential factors in a learner's education.

Under these models, it is clear that there is a need (or at least a strong benefit) for full integration of the arts and other areas, so as not to lose the learning and knowledge value of arts within sciences/other areas, which can ultimately harm student learning (Beane, 1998; Jacobs, 2005).

It is crucial to acknowledge that for some artist-educators, like Rose, it is communication studies/interactive studies that contribute to art, not the other way around. This observation is consistent with the concept of art-centered integrated learning, in which the arts are a core subject and not simply a means of expression (Marshall & Donahue, 2015).

However, as this research has also shown, at least in the experience of these artist-educators, arts has played a subordinate and marginal role in education. This is more consistent with the historic or traditional position of the arts in integrated studies, which is that it is a medium for communication rather an object of interest in and of itself (Roucher & Lovano-Kerr, 1995; Suraco, 2006). It is disheartening to recognize that the marginalization of the arts continues even within STEAM, as this is likely to continue to minimize its role as a subject of primary interest and relegate arts to a communication channel.

The Experience of Being an Artist-Educator-Researcher

A further insight this research has provided is that there is no single path to or experience of being an interdisciplinary artist who is an artist-educator or artist-researcher. The artists here did have a combination of roles, with Mr. Frog being the most obvious artist-researcher as well as the artist whose experience was predominantly as a scientist/biologist rather than as an artist.

One of the ways that these findings differ from others is that while, for example, other studies have shown that integration is done by science teachers who learn art (Henriksen, 2014; Herro & Quigley, 2017), in this research, two out of three participants were artist-educators who learned science/the environment for integration. However, for all of the artists involved, the ideal of the “art-infused classroom” (Hunter-Doniger, 2018a, p. 23) is not quite realized. Instead, the authors are predominantly concerned either with art as a channel to science or vice versa.

Among the biggest gaps in this research is that the participants did not shed much light on the role of artist-researcher; in short, they could not, because they did not engage in research as such (although Mr. Frog has done so in the past). Unfortunately, this is consistent with the existing literature, where only a few studies have addressed this perspective (Guyotte et al., 2015). Land’s (2013) argument, that arts integration is predominantly a concern of teachers and artists, would seem to apply here. However, it does leave open the question of what kind of activity artist-researchers are engaging in, and why.

Summary

As the artists interviewed for this research show, there is no single starting point for or journey to a self-concept as an artist-educator or artist-researcher. Instead, all three artists had a different initial interest, educational background, and point of insight that led them toward this process.

However, their perspectives did converge in several areas. First, the roles of artist, educator, and researcher are separate but interdependent. Second, all three roles interact with the engagement of others (students, audiences, collaborators, and others) in different ways. These interactions lead to a cycle of exchange, in which both the art and the participants are enriched. Furthermore, this engagement leads the audience toward understanding of the chosen integrated discipline in various ways.

Finally, art and science/the participants' specific areas are interdependent and co-creating in STEAM, serving as mediums for each other and as alternative ways to talk about human problems. However, this does not mean that these integrations are straightforward or easy. Resistance from others and a perceived subordinate or marginal role of arts within STEAM mean that arts are rarely, if ever, centralized as a medium or vehicle for understanding. The following chapter concludes the study and discusses implications of the findings.

Chapter 5

Conclusion

The previous chapter presented the findings of the research, which were derived from interviews with three interdisciplinary artists which were analyzed using narrative thematic analysis. This chapter integrates these findings with the prior work in order to provide a conclusion to the chapter. The conclusion begins with a summary of the research's key findings and an answer to the objectives. The implications of the finding for interdisciplinary arts theory and practice is then discussed. The chapter closes with a reflection on the study limitations and recommendations for future research.

Summary of Findings

In this research, I set out to investigate interdisciplinary artists in their various roles, including artist, artist-educator, and artist-researcher, and analyze their experience of the interdisciplinary arts. The focus of the research was on interdisciplinary artist-educators who worked in the area of Science, Technology, Engineering, Arts and Mathematics (STEAM), an extension of the field of STEM to not just draw passively on the lessons of the arts but to incorporate the logics, techniques and practices of the arts into scientific endeavors.

The research began with two broad questions:

- 1.) How do interdisciplinary artists conceptualize themselves as art educators?
- 2.) How can interdisciplinary artists' experiences and understandings inform how STEAM is implemented within art education?

To investigate these questions, I drew on detailed interviews with three interdisciplinary artists, who worked in diverse fields of inquiry in which they integrated science, the environment, and communication studies with art. I analyzed the interviews using a thematic analysis approach to draw out specific shared and different experiences.

In relationship to RQ1, it can be stated that there is no single conceptualization as an interdisciplinary artist. Instead, each of the artists I interviewed had their own path toward interdisciplinarity. They might start from a position as an artist, as a biologist, or primarily as an educator, and they might then incorporate (or not) different aspects of identity such as

educator, researcher and artist. They might use art as a medium to communicate about their specific areas, or their specific areas as a medium to communicate about art. However, there were some shared understandings of the role of the interdisciplinary artist in general that can be derived from the research.

First, the roles of artist, educator, and researcher exist in tension with each other. Each of these roles is distinct, with its own duties, implications and set of assumptions and practices. However, they are also interdependent. To be an artist-educator or artist-researcher is to be *also* an artist and an educator and/or researcher, at different times or simultaneously. Second, artist-educator-researchers do not act in isolation. Instead, they exist within a network of collaborators, including students, fellow artist-educator-researchers, members of the community, institutions (or their representatives) and audiences.

Each of these network members brings something, whether this is skills and mindset to collaborative work or return of attention in the cycle of exchange between artist and author, without which the role of artist-educator-researcher would not work. In relation to RQ2, although STEAM theoretically incorporates art, the artist's perspectives are that this role is still marginal, with science predominating within the relationship.

There are many barriers to changing this relationship, because, at least in part, other members of the collaborative network do not view themselves as artists. Differing levels of engagement and collaboration provide a route out of this dilemma. Simply, interdisciplinary artists' experiences and understandings can influence the role of art in STEAM by engaging with other collaborators and encouraging them to think about the possibilities of the artistic logic and practice for the development of science.

In conclusion, I refer back to Mr. Frog's observation: the problems that we face in today's world are *not* problems of art or science, but of humanity. Only through a broad application of all of the tools humanity has for problem solving, including art as well as myriad of other logics and practices, can we hope to solve them.

Implications

A hard fact of the practice of art is that while the artist is transformed by their encounter with their work, piece by piece, the audience's encounter lasts only for a brief moment in time (Jahoda & Woolard, 2019). The interdisciplinary artist-educator, by contrast,

extends this encounter, providing their students and collaborators with the power for self-transformation through their own work. In this way, the role of artist-educator is less that of artistry than of, in the words of Sam, of scaffold-building – providing the outlines within which, or outside which, others can create.

The implication of this is that the artist-educator has a role to play in re-forming educational practice today. Jahoda and Woolard (2019) argued that “what is taught in art classes today feels out of touch with lived experiences” (p. 98)– disembodied, distracted and divorced from everyday life and practice. This joins John Dewey’s (1958) observation that teaching which creates isolated boxes for individual subjects does not lead to learning, offering children no opportunity to draw horizontal connections between different domains of understanding. Such isolated teaching practices make no allowances for multiple intelligences (Gardner, 1983) or for the natural curiosity and problem-solving capabilities of the child (Bruner, 1966). In short, isolated, subject-driven, non-interdisciplinary teaching practices are broken and must be fixed.

This study showed that the problem of isolationist teaching practices continues to exist because, in some ways, people still want it to exist. Despite lip service paid to arts and integrated learning, in practice, interdisciplinary learning is the first sacrifice in times of budget cuts or performance anxiety. This is ironic since the arts offers a rich vein of problem-solving techniques and representation and communication opportunities which could enrich, rather than threaten, the learning performance of children. Through this research, I have supported a call for greater integration and centralization of the arts in interdisciplinary learning. The voices of my artist respondents have also called out, supporting the use of art as a way of understanding the position of humankind and the effect of its actions upon our shared world. Thus, the final implication of this research is that to fix the problems identified here and by other artist-educators, art must not just be tolerated within STEAM, but be promoted to an integral position within it.

Limitations and Recommendations for Future Research

This research did have several limitations in addition to the methodological limitations discussed in Chapter 3. One of these limitations is that although the researcher used narrative and rich description to deepen the understanding of the study material, the

study did ultimately draw on only a small number of artist-educators. Their viewpoints are not necessarily reflective of all artist-educators. Furthermore, the study's findings take place within a specific educational context and social environment, from which they cannot be separated. Of particular importance is the emergence (or perhaps just entrenchment) of a tendency within educational policy to marginalize the arts in favor of what are perceived as the more "valuable" STEM subjects. Finally, the experience of the artist-researcher remained stubbornly vague and poorly defined, despite attempts to investigate it. This means that the study objectives were difficult to accomplish fully.

One of the reasons why the experience of the artist as researcher remains vague is that there is, in actuality, little research or theorization about exactly what that role is or how it can be conceptualized. Instead, most attention in studies on interdisciplinary research has been focused on the roles of artists and educators, who are conceptualized as separate individuals rather than a single individual acting in multiple, sometimes disparate roles. Thus, there is a call for more research into the different roles that artists play in interdisciplinary studies, both as it relates to STEAM and to other integrations. There is also a need to investigate exactly how research is conducted in interdisciplinary studies, using a reflexive lens to understand what researchers are researching. This perspective is essential because to date, there has been little concern on this subject, which calls into question the biases and unspoken assumptions of researchers as actors within the interdisciplinary network.

Bibliography

- Anzaldúa, G. (1987). *Borderlands/la frontera*. San Francisco, CA: Aunt Lute Book.
- Aram, J. (2004). Concepts of interdisciplinarity: Configurations of knowledge and action. *Human Relations*, 57(4), 379–412. <https://doi.org/10.1177/0018726704043893>
- Bailey, C. (2015). An artist's argument for STEAM education. *The Education Digest*, 81(1), 21-23. Retrieved from <http://proxy.lib.utk.edu:90/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=109031676&scope=site>
- Baxter, K. (2014). A convergence of three: The reflexive capacity of art practice, curriculum design, and pedagogy. *Art Education*, 67(6), 28–34. <https://doi.org/10.1080/00043125.2014.11519295>
- Beane, J. (1993). In search of a middle school curriculum. *The Education Digest*, 59(2), 24–28. Retrieved from <http://search.proquest.com/docview/1942559465/>
- Beane, J. (1997). *Curriculum integration designing the core of democratic education*. New York, NY: Teachers College Press.
- Belardo, C. M.-A. (2015). *STEM integration with art: A renewed reason for STEAM* (Master's thesis, University of Wyoming). Retrieved from <https://pdfs.semanticscholar.org/7663/9c72443536036e7e121713607d6449733db2.pdf>
- Bloom, B. S. (1956). *Taxonomy of educational objectives*. New York, NY: MacKay.
- Bochner, A., & Ellis, C. (2003). An introduction to the arts and narrative research: Art as inquiry. *Qualitative Inquiry*, 9(4), 506–514. <https://doi.org/10.1177/1077800403254394>
- Bossio, D., Loch, B., Schier, M., & Mazzolini, A. (2014). A roadmap for forming successful interdisciplinary education research collaborations: a reflective approach. *Higher Education Research & Development*, 33(2), 198–211. <https://doi.org/10.1080/07294360.2013.832167>
- Bruner, J. S. (1966). *Toward a theory of instruction*. Cambridge, MA: Harvard University Press.
- Buffington, M., Williams, A., Ogier, E., & Rouatt, L. (2016). Telling our tales: Becoming art educators. *Studies in Art Education*, 57(4), 329–340. <https://doi.org/10.1080/00393541.2016.1204524>

- Bulmer, M. (1979). Concepts in the analysis of qualitative data. *The Sociological Review*, 27(4), 651-677. Retrieved from <https://journals.sagepub.com/doi/abs/10.1111/j.1467-954X.1979.tb00354.x?journalCode=sora>
- Carp, D. (2017). *Teaching interdisciplinary artistic research*. Amsterdam, NL: Artist in Residence Programme Amsterdam University Press. Retrieved from https://www.eno-net.eu/sites/default/files/teaching_interdisciplinary_artistic_research.pdf
- Carrillo, C., & Baguley, M. (2011). From school teacher to university lecturer: Illuminating the journey from the classroom to the university for two arts educators. *Teaching and Teacher Education*, 27(1), 62–72. <https://doi.org/10.1016/j.tate.2010.07.003>
- Clandinin, D. (2013). *Engaging in narrative inquiry*. New York, NY: Taylor & Francis.
- Clandinin, D. (2007). *Handbook of narrative inquiry mapping a methodology*. Thousand Oaks, CA: SAGE.
- Clandinin, D., & Connelly, F. (1990). Narrative, experience and the study of curriculum. *Cambridge Journal of Education*, 20(3), 241–253. <https://doi.org/10.1080/0305764900200304>
- Clandinin, D., & Connelly, F. (1996). Teachers’ professional knowledge landscapes: Teacher stories. stories of teachers. school stories. stories of schools. *Educational Researcher*, 25(3), 24–30. <https://doi.org/10.3102/0013189X025003024>
- Clandinin, D, Pushor, D., & Orr, M. (2007). Navigating sites for inquiry. *Journal of Teacher Education*, 58(21). Thousand Oaks, CA: Sage Publications.
- Chapman, L. H. (2004). No child left behind in art? *Arts Education Policy Review*, 106(2), 3–20. <https://doi.org/10.3200/AEPR.106.2.3-20>
- Chettiparamb, A. (2007). Interdisciplinarity: A literature review. *Report, Interdisciplinary Teaching and Learning Group*. Southampton, CA: The Interdisciplinary Teaching and Learning Group, Subject Centre for Languages, Linguistics and Area Studies, School of Humanities, University of Southampton. Retrieved from https://www.researchgate.net/profile/Angelique_Chettiparamb/publication/323845917_Interdisciplinarity_a_literature_review/links/5aaf0c72458515e3e9746b/Interdisciplinarity-a-literature-review.pdf

- Consorte-McCrea, A., Newing, H., Morad, M., Wade, R., & Vickery, L. (2015). Creating spaces for interdisciplinary exchange in higher education: A case study. *Local Economy: The Journal of the Local Economy Policy Unit*, 30(3), 265–279. <https://doi.org/10.1177/0269094215578219>
- Consortium of National Art Education Associations. (2002). *Authentic connections: Interdisciplinary work in the arts*. Retrieved from <https://www.arteducators.org/research/articles/103-authentic-connections-interdisciplinary-work-in-the-arts>
- Daugherty, M. K. (2013). The prospect of an "A" in STEM education. *Journal of STEM Education: Innovations and Research*, 14(2), 10–15.
- Davies, W., Devlin, M., & Tight, M. (2010). *Interdisciplinary higher education: Perspectives and practicalities*. Bingley, BC: Emerald.
- Dillon, P. (2008). A pedagogy of connection and boundary crossings: Methodological and epistemological transactions in working across and between disciplines. *Innovations in Education and Teaching International*, 45(3), 255–262. <https://doi.org/10.1080/14703290802176121>
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus : Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota Press.
- Dewey, J. (1934). *Art as experience*. New York, NY: Minton, Balch & company.
- Dewey, J. (1963) *Experience and education*. New York, NY: Collier Books.
- Efron, S. E., & Ravid, R. (2019). *Writing the literature review*. London, UK: The Guilford Press.
- Eisner, E. (2002). *The arts and the creation of mind*. New Haven, CT: Yale University Press.
- Eisner, E., & Day, M. (2004). *Handbook of research and policy in art education*. Florence: Taylor and Francis.
- Erickson, H. (1998). *Concept-based curriculum and instruction : Teaching beyond the facts*. Thousand Oaks, CA: Corwin Press.
- Ewens, T. (1992). Human sciences and art education: The theory of mediation. *Design For Arts in Education*, 93(6), 2–16. <https://doi.org/10.1080/07320973.1992.9935585>
- Fisher, W. (1985). The narrative paradigm: An elaboration. *Communication Monographs*, 52(4), 347–367. <https://doi.org/10.1080/03637758509376117>

- Friend, M., & Bursuck, W. D. (1999). *Including students with special needs*. Boston, MA: Allyn & Bacon.
- Gardner, H. (1983). *Frames of Mind*. New York, NY: Basic Books.
- Garoian, C. (2001). Performing the Museum. *Studies in Art Education*, 42(3), 234–248.
<https://doi.org/10.1080/00393541.2001.11651700>
- Gettings, M. (2016). Putting it all together: STEAM, PBL, scientific method, and the Studio Habits of Mind. *Art Education*, 69(4), 10–11.
<https://doi.org/10.1080/00043125.2016.1176472>
- Goodson, I. & Gill, S. (2010). *Narrative pedagogy: life history and learning*. New York, NY: Peter Lang Publishing.
- Graff, H. J. (2016). The “problem” of interdisciplinarity in theory, practice, and history. *Social Science History*, 40(4), 775–803. <https://doi.org/10.1017/ssh.2016.31>
- Guyotte, K., Sochacka, N., Costantino, T., Kellam, N., & Walther, J. (2015). Collaborative creativity in STEAM: Narratives of art education students’ experiences in transdisciplinary spaces. *International Journal of Education & the Arts*, 16(15), 2-38.
- Hannon, J., Hocking, C., Legge, K., & Lugg, A. (2018). Sustaining interdisciplinary education: Developing boundary crossing governance. *Higher Education Research & Development*, 37(7), 1424–1438. <https://doi.org/10.1080/07294360.2018.1484706>
- Hargreaves, A., & Moore, S. (2000). Curriculum integration and classroom relevance: A study of teachers’ practice. *Journal of Curriculum and Supervision*, 15(2), 89-112.
 Retrieved from <https://web-b-ebshost-com.proxy.lib.utk.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=b1ba3547-f116-4484-88d7-a76445e7e217%40sessionmgr103>
- Harper, C. (2017). The STEAM powered classroom (science, technology, engineering, arts and mathematics and problem-based learning). *Educational Leadership*, 75(2), 70–74.
- Hartle, L., Pinciotti, P., & Gorton, R. (2015). ArtsIN: Arts integration and infusion framework. *Early Childhood Education Journal*, 43(4), 289–298.
<https://doi.org/10.1007/s10643-014-0636-7>
- Henriksen, D. (2014). Full STEAM ahead: Creativity in excellent STEM teaching practices. *The STEAM Journal*, 1(2), 1–9. <https://doi.org/10.5642/steam.20140102.15>

- Herro, D., & Quigley, C. (2017). Exploring teachers' perceptions of STEAM teaching through professional development: Implications for teacher educators. *Professional Development in Education*, 43(3), 416–438.
<https://doi.org/10.1080/19415257.2016.1205507>
- Hetland, L., & Winner, E. (2001). The arts and academic achievement: What the evidence shows. *Arts Education Policy Review*, 102(5), 3–6.
<https://doi.org/10.1080/10632910109600008>
- Hetland, L., Winner, E., Veenema, S., & Sheridan, K. M. (2015). *Studio thinking 2: The real benefits of visual arts education*. New York, NY: Teachers College Press.
- Hunter-Doniger, T. (2018a). Art infusion: Ideal conditions for STEAM. *Art Education*, 71(2), 22–27. <https://doi.org/10.1080/00043125.2018.1414534>
- Hunter-Doniger, T. (2018b). Project-based learning: Utilizing artistic pedagogies for educational leadership. *Art Education*, 71(2), 46–51.
<https://doi.org/10.1080/00043125.2018.1414542>
- Jacobs, C. (2005). On being an insider on the outside: New spaces for integrating academic literacies. *Teaching in Higher Education*, 10(4), 475–487.
<https://doi.org/10.1080/13562510500239091>
- Jacobs, H. (1991). Planning for curriculum integration. *Educational Leadership*, 49(2), 27–28. Retrieved from <http://search.proquest.com/docview/1290185533/>
- Jacobs, H. (1997). *Mapping the big picture : Integrating curriculum and assessment, K-12*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Jacobs, H. H. (1989). *Interdisciplinary curriculum: Design and implementation*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Jacobs, H. H. (2010). *Curriculum 21: Essential education for a changing world*. New York, NY: ASCD.
- Jahan, N., Naveed, S., Zeshan, M., & Tahir, M. A. (2016). How to conduct a systematic review: A narrative literature review. *Cureus*, 8(11).
<https://doi.org/10.7759/cureus.864>
- Jahoda, S., & Woolard, C. (2019). *Making and being: Embodiment, collaboration and circulation in the visual arts*. Brooklyn, NY: Pioneer Works Press.

- Kim, J. (2016). *Understanding narrative inquiry : The crafting and analysis of stories as research*. Los Angeles, CA: SAGE Publications, Inc.
- Klaassen, R. (2018). Interdisciplinary education: A case study. *European Journal of Engineering Education*, 43(6), 842–859.
<https://doi.org/10.1080/03043797.2018.1442417>
- Klein, J. (1990). *Interdisciplinarity : History, theory, and practice*. Detroit, MI: Wayne State University.
- Klein, J. T. (1996). *Crossing boundaries: Knowledge, disciplinarity and interdisciplinarity*. Charlottesville, VA: University of Virginia Press.
- Klugman, C. M., & Beckmann-Mendez, D. (2015). One thousand words: Evaluating an interdisciplinary art education program. *Journal of Nursing Education*, 54(4), 220–223. <https://doi.org/10.3928/01484834-20150318-06>
- Kovalik, S., & Olsen, K. (1994). *Integrated thematic instruction (ITI): The model*. Kent, WA: Books for Educators.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago, IL: University of Chicago Press.
- Land, M. H. (2013). Full STEAM ahead: The benefits of integrating the arts into STEM. *Procedia Computer Science*, 20, 547–552. <https://doi.org/10.1016/j.procs.2013.09.317>
- Lattuca, L. R. (2003). Creating interdisciplinarity: Grounded definitions from college and university faculty. *History of Intellectual Culture*, 3(1), 1–20. Retrieved from http://activetectonics.asu.edu/teaching/GLG494-ICOG/Papers/lattuca_2003.pdf
- Madden, M. E., Baxter, M., Beauchamp, H., Bouchard, K., Habermas, D., Huff, M., ... & Plague, G. (2013). Rethinking STEM education: An interdisciplinary STEAM curriculum. *Procedia Computer Science*, 20, 541–546.
<https://doi.org/10.1016/j.procs.2013.09.316>
- Maeda, J. (2013). STEM + Art = STEAM. *Steam*, 1(1), 1–3.
<https://doi.org/10.5642/steam.201301.34>
- Mallery, A. (2000). *Creating a catalyst for thinking : The integrated curriculum*. Boston, MA: Allyn & Bacon.

- Marshall, J. (2006). Substantive art integration = Exemplary art education. *Art Education*, 59(6), 17–24. <https://doi.org/10.1080/00043125.2006.11651615>
- Marshall, J. (2014). Transdisciplinarity and art integration: Toward a new understanding of art-based learning across the curriculum. *Studies in Art Education*, 55(2), 104–127. <https://doi.org/10.1080/00393541.2014.11518922>
- Marshall, J., & Donahue, D. M. (2014). *Art-centered learning across the curriculum: Integrating contemporary art in the secondary school classroom*. Teachers College Press.
- Mote, C., Strelecki, K., & Johnson, K. (2014). Cultivating high-level organizational engagement to promote novel learning experiences in STEAM. *Steam*, 1(2), 1–9. <https://doi.org/10.5642/steam.20140102.18>
- National Art Education Association. (2014). Position statement on STEAM education Retrieved from <https://arteducators-prod.s3.amazonaws.com/documents/952/ac75d3e3-b19d-4910-8376-3e30e08faf6d.pdf?1491421827>
- Nissani, M. (1995). Fruits, salads and smoothies: A working definition of interdisciplinarity. *The Journal of Educational Thought/Revue de La Pensée Éducative*, 29(2), 121–128.
- Overton, D. T., & Chatzichristodoulou, M. (2010). The teaching of science through the performing arts. *Procedia - Social and Behavioral Sciences*, 2(2), 3871–3875. <https://doi.org/10.1016/j.sbspro.2010.03.607>
- Ozkan, G., & Topsakal, U. U. (2017). Examining students’ opinions about STEAM activities. *Journal of Education and Training Studies*, 5(9), 115. <https://doi.org/10.11114/jets.v5i9.2584>
- Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. *Thinking Skills and Creativity*, 31(October 2018), 31–43. <https://doi.org/10.1016/j.tsc.2018.10.002>
- Peterson, V. V. (2008). Against interdisciplinarity. *Women and Language*, 31(2), 42–50.
- Petroelje Stolle, E., & Frambaugh-Kritzer, C. (2014). Putting professionalism back into teaching: Secondary preservice and in-service teachers engaging in interdisciplinary unit planning. *Action in Teacher Education*, 36(1), 61–75. <https://doi.org/10.1080/01626620.2013.850123>

- Post, R. (2009). Debating disciplinarity. *Critical Inquiry*, 35(4), 749–770.
<https://doi.org/10.1086/599580>
- Radziwill, N., Benton, M., & Moellers, C. (2015). From STEM to STEAM: Reframing what it means to learn. *Steam*, 2(1), 1–7. <https://doi.org/10.5642/steam.20150201.3>
- Riessman, C. K. (2008) *Narrative methods for the human sciences*. Los Angeles, CA: Sage Publications.
- Robinson, K. A. (2017). *Makerspace in the elementary art room* (Master's thesis). Retrieved from <https://digscholarship.unco.edu/cgi/viewcontent.cgi?article=1005&context=arp>
- Rolling, J. H. (2016). Reinventing the STEAM engine for art + design education. *Art Education*, 69(4), 4–7. <https://doi.org/10.1080/00043125.2016.1176848>
- Roucher, N., & Lovano-Kerr, J. (1995). Can the arts maintain integrity in interdisciplinary learning? *Arts Education Policy Review*, 96(4), 20–25.
<https://doi.org/10.1080/10632913.1995.9934554>
- Rush, J., & Conant, H. (1979). Excellence: The key to educating visual artists. *Art Education*, 32(8), 8–15. <https://doi.org/10.1080/00043125.1979.11649624>
- Schwandt, T. (1994). *The Sage dictionary of qualitative inquiry*. Thousand Oaks, CA: Sage publications. Retrieved from <https://www.researchgate.net/publication/232477264>
- Seidel, S., Tishman, S., Winner, E., Hetland, L., & Palmer, P. (2009). *The qualities of quality: Understanding excellence in arts education*. Cambridge, MA: Project Zero, Harvard Graduate School of Education.
- Sterling, S., Selby, D., & Sterling, S. (2010). *Sustainability education : Perspectives and practice across higher education*. London, UK: Routledge.
- Stokrocki, M. (Ed.). (2005). *Interdisciplinary art education: Building bridges to connect disciplines and cultures*. Reston, VA: NAEA.
- Suraco, T. L. (2006). *An interdisciplinary approach in the art education curriculum* (Master's thesis). Retrieved from <https://api.semanticscholar.org/CorpusID:107448652> (S2CID 107448652)

- Szekely, G. (1997). The art educator as artist George Szekely's new art. *Art Education*, 50(1), 29–60. <https://doi.org/10.1080/00043125.1997.11652855>
- Tanner, D. (2013). Race to the top and leave the children behind. *Journal of Curriculum Studies*, 45(1), 4–15. <https://doi.org/10.1080/00220272.2012.754946>
- Thorburn, M. (2017). Dewey, democracy, and interdisciplinary learning: A Scottish perspective. *Oxford Review of Education*, 43(2), 242–254. <https://doi.org/10.1080/03054985.2017.1284657>
- Tyler, R. W. (1949). *Basic principles of curriculum and instruction*. Chicago, IL: Chicago University Press.
- Ulbricht, J. (1998). Interdisciplinary art education reconsidered. *Art Education*, 51(4), 13–17. <https://doi.org/10.1080/00043125.1998.11654335>
- Vars, G. (2001). Can curriculum integration survive in an era of high-stakes testing? *Middle School Journal*, 33(2), 7–17. <https://doi.org/10.1080/00940771.2001.11494658>
- Williams, D. E. (2013). *STEM+ visual art: The development of an art integrated curricular resource for K-12 educators in Idaho* (Master's thesis). Retrieved from <https://api.semanticscholar.org/CorpusID:46186746> (S2CID 46186746)
- Winner, E., & Cooper, M. (2000). Mute those claims: No evidence (yet) for a casual link between arts study and academic achievement. *Journal of Aesthetic Education*, 34(3/4), 11–75. <https://doi.org/10.2307/3333637>
- Witherell, C. (1991). Narrative and the moral realm: Tales of caring and justice. *Journal of Moral Education*, 20(3), 237–242. <https://doi.org/10.1080/0305724910200301>

Appendices

Appendix A
Interview Guide

Interview Guide

You have been invited to participate in a research project through the University of Tennessee. The reason for the research is to explore interdisciplinary artists' experiences of interdisciplinary arts practice.

The results of this participation will be confidential, and will not be released in any individually identifiable form. The interviews will be audiotaped. The tapes will be transcribed, and your words may be quoted. If so, a different name will be used to ensure that you cannot be identified in any way.

For this project, I will interview you for approximately an hour on your experiences of interdisciplinary arts practice.

You are free to stop the interview and withdraw your participation at any time should you become uncomfortable with it. I hope you will enjoy this opportunity to share your experiences and viewpoints with us.

Do you have any questions? ____

Do you agree to participate in this study? ____

Okay. May I begin recording? ____

[Turn on recorders]

Building Rapport

I appreciate your help with this interview. Over the past ____, we have gotten to know each other. During this interview feel free to tell me things that you might have mentioned before. Also, feel free to talk in as much detail as you can.

Interview Questions

1). Tell me how you became interested in creating art that collaborates with other areas.

a). Tell me more about your role.

b). What your goal was in the project that you mentioned?

2). Tell me about a time when you worked or collaborated with other subjects/community members.

3). Tell me more about a time when you had a transformational experience in collaborative art with more than one discipline.

4). Tell me more about a project that you would consider successful.

a). Tell me about your process of creating that kind of art that you mentioned?

b). Tell me more about your responsibilities in that specific project.

5). Is there anything else about interdisciplinary art that you'd like to tell me about or I haven't asked about today?

Thank you so much for sharing your thoughts and opinions with me today and helping me learn about the value and the potential of interdisciplinary art in different angles through your special experiences.

[Turn off recorders]

Appendix B
Recruitment Script

Recruitment Script

Date _____

Dear _____

I hope that this email finds you well. My name is Ninut Karnthaworn, a graduate student in art education at the University of Tennessee. I am conducting a research study examining interdisciplinary artists' experiences and how those might inform art education. You are eligible to participate in this study because of your experiences as an interdisciplinary artist.

I would like to interview you as the participant of the study. This interview would take approximately one hour. This interview could be conducted at your studio or at library room I reserve. During the interview, you will be asked a series of questions focused on your experiences as an interdisciplinary artist.

I would also like to use images of two to three of your art pieces that are relevant to the study. If you consent, your art pieces would be photographed/scanned for analysis or, if more convenient, you could provide me with pre-existing photographic images.

Would it be okay with you if I use the data within this context (August 16- September 30, 2019) to examine as part of the study? Would it also be okay with you if I analyze your art pieces through their relevance to the study and your art pieces would be photographed/scanned for analysis and then returned to you?

This participation is completely voluntary, and you may say "no" if you do not want to participate in this study. If you agree and then later decide you do not want your data to be used as part of this study, you may withdraw your consent at any time. During the interview, talking about memories from prior events can evoke powerful feelings and unexpected emotions. You can skip any questions or terminate the interview at any time if you experience any feelings of discomfort and wish to move on or discontinue the interview.

Potential risks of participation in this research include a breach of confidentiality. Benefits include contributing to the knowledge base in the field of art teacher preparation. If it is okay with you, I might want to use direct quotes from your interview, but pseudonyms would be used. The results of this participation will be confidential and will not be released in any individually identifiable form without your prior consent.

Please do not hesitate to reach out to me if you have any questions or concerns. Thank you so much for your consideration.

Sincerely,

Ninut Karnthaworn

Appendix C
Informed Consent Statements

INFORMED CONSENT STATEMENT

Interdisciplinary Art Practice: Implications for Art Education

INTRODUCTION

You are invited to participate in a research study. The objective of this study is to explore interdisciplinary artists' experiences of interdisciplinary arts practice. You are being asked to participate in this research study because of your experiences as an interdisciplinary artist.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY

This study analyzes data from the period of August 5-September 30, 2019. The researcher would like to interview you as a participant of the study. This one interview will take approximately one hour. This interview will be conducted at your studio or at library room I reserve. During this interview, you will be asked a series of questions focused on your experiences as an interdisciplinary artist.

The researcher would like to use images of two to three art pieces that are relevant to the study. If you consent, your art pieces would be photographed/scanned for analysis or, if more convenient, you could provide the researcher with pre-existing photographic images.

Your research information will not be used for future research studies or shared with other researchers for use in future research studies.

RISKS

Potential risks of participation in this research include a breach of confidentiality. Your participation is voluntary. During the interview, talking about memories from prior events can evoke powerful feelings and unexpected emotions. You can skip any questions or terminate the interview at any time if you experience any feelings of discomfort and wish to move on or discontinue the interview.

BENEFITS

You may not directly benefit from your participation in this research study. The benefits that you may expect from the research are contributing to the knowledge base in the field of art education.

CONFIDENTIALITY

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DP Participant's initials

CONTACT INFORMATION

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Ninut Karnthaworn at nkarntha@vols.utk.edu or 865-244-9765, or the supervising research professor, Dr. Joy Bertling, at BEC 109, and 865-974-8602. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-7697.

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CONSENT

I have read the above information. I have received a copy of this form. I agree to participate in this study.

Participant's signature Dana Potter Date 8-10-2019

Investigator's signature Ninut Karnthaworn Date 8/10/2019

Supervising research professor's signature Joy H. Bertling Date 12/20/19

INFORMED CONSENT STATEMENT

Interdisciplinary Art Practice: Implications for Art Education

INTRODUCTION

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The researcher would like to use images of two to three art pieces that are relevant to the study. If you consent, your art pieces would be photographed/scanned for analysis or, if more convenient, you could provide the researcher with pre-existing photographic images.

Your research information will not be used for future research studies or shared with other researchers for use in future research studies.

RISKS

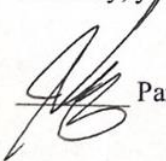
Potential risks of participation in this research include a breach of confidentiality. Your participation is voluntary. During the interview, talking about memories from prior events can evoke powerful feelings and unexpected emotions. You can skip any questions or terminate the interview at any time if you experience any feelings of discomfort and wish to move on or discontinue the interview.

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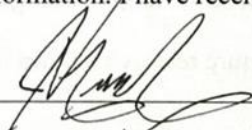
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Participant's signature



Date

8-2-19

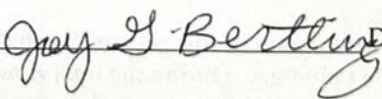
Investigator's signature

Ninut Karnthaworn

Date

8/21/2019

Supervising research professor's signature



Date

12/20/19

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BH3

_____ Participant's initials

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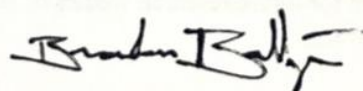
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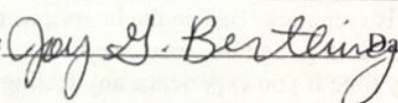


Date 30 August 2019

Investigator's signature Ninut Karnthaworn

Date 8/30/2019

Supervising research professor's signature



Date 12/20/19

Appendix D
Sam's Interview Transcription

Coding guide:

- Emerging as an interdisciplinary art educator
- Tension between creating, teaching and researching art
- Engagement and the role of artist and audience
- Role of art in STEAM education

Interview Transcription

1. Interviewer: (I)

2. Interviewee: (R)

3. Date: August 21, 2019

4. Time: 10:00 am- 11:00 am

5. Place: Room 135C at John C. Hodges Library, University of Tennessee, Knoxville

6. Participant's pseudonym: Sam

7. Transcription conventions used:

8. (4.0) Timed pauses, in seconds

9. (()) Transcriber's description

10. (Laughs) Description of what was happening – extra sounds

11. The names of the programs were typed in *italics*

12. The interviewer's questions and statements are in **bold**

13.

14. R: I'll try. (laughter)

15. I: **All right. Tell me how you became interested in creating art that collaborates with**

16. **other areas.**

17. R: Um. Oh boy. Where to start? I think, I think I guess I'll start as a, being a kid, right?

18. Like I was always a creative artistic kid but I was always interested in, in nature and the
19. outdoors and watching nature documentaries and, you know, if you'd ask me when I was a
20. kid what I'd like to do when I grew up, I would probably say biologist or marine biologist
21. or something. Um. I, you know, I really wanted to be a scientist. Um, but I understood the
22. world in visual, creative ways.

23.

24. R: And it, it wasn't until I was in high school that I was like, oh I can go to school for art
25. and I can still be interested in, in a, these more natural, natural history or, you know,
26. scientific subjects. I don't have to, I don't have to go to school to be a scientist to enjoy
27. science and like science. So I guess that's, that's the start of it.

28. I: **Um. And, um, uh, tell me more about, um, your project or your, um, your role in a**
29. **project that you, um, think that, um, you collaborate with other areas and you think**

30.that, um, you might tell me about or that's important to you, or.

31.R: Um, sure. Uh, maybe this is a roundabout way of answering this question, but I really
32.enjoyed the artist Mel Chin. He did this project, um, called Revival Field and it was in
33.collaboration with a scientist, where they, uh, did an installation of plants in a toxic
34.environment. Um, and the plants, the plants gathered lead from the soil. So he was doing
35.that as an art project but it had this scientific and ecological merit that, uh, I'm just so into
36.(laughs) that.

37.

38.R: Um. So my own artwork, I mean it's, it's all over the place. But, um, uh, maybe an
39.example is, uh, in my studio practice I've been doing these ceramic sculptures called
40.biological indicators where I'm formulating a clay body to supply nutrients to, um,
41.lifeforms that colonize the surface.

42.I: Hm.

43.R: So if you've ever seen, um, like lichens and algae and bacteria on the surface of
44.concrete, they're actually, you know, they're, the, those organisms are, are using the
45.concrete as a, as an environment, um. And so I was really interested in making sculptures
46.that invited those organisms to interact with the surface. Um, so maybe that's one
47.example. I don't think it has the same social components that the Mel Chin project does
48.that I referenced earlier, but it's still cool. (laughter)

49.I: Yeah. Um. You, just back where the, you mentioned about when you were a kid,
50.um, you saw like you watch something on TV media, um? Would you mind to, um,
51.expand that, um-

52.R: Uh.

53.I: ... experience about, um, you know, that can influence you in terms of, you know,
54.any aspect that you can create art, or?

55.R: Yeah.

56.I: Yeah.

57.R: So I mean as a kid I loved watching nature documentaries.

58.I: Mm-hmm (affirmative).

59.R: And I just loved playing outside and I loved drawing and painting too. But I think as a
60.kid growing up, you learn that art is drawing and painting and that science and biology is
61.like, you know, playing in the mud and, and studying organisms. But I think as an adult I
62.figured out art doesn't just have to be painting, right? Like you can, you can use, uh,
63.subjects from the sciences as, as, uh, not only subjects but as mediums.

64.

65.R: And all of a sudden the lines get a lot more blurred, right? Like I don't like this like, uh,
66.this duality, right? Where it's like, artist or scientist? Like there's, there's plenty of

67.examples where, you know, people are both.

68.I: **Mm-hmm (affirmative).**

69.R: If that makes sense. I hope that answered your question.

70.I: **Yeah. Yeah. Um. And you mentioned about subject and medium, like the variety**

71.**of, um, creating art?**

72.R: Mm-hmm (affirmative).

73.I: **And, um, would you mind to, you know, talk more about that experience? Like**

74.**where did you get that from? Or, um, like how you originally, like how you figure it**

75.**out?**

76.R: Sure. I mean, I think it's coming from having a, an art education at a higher, like a

77.higher art education, right? There's like, the baseline concept of like what art is and then

78.as you go through college, now I'm in this graduate program, um, it, art's, art today can be

79.way more conceptually based, right? Um. And so that the idea that it's not just these like

80.classic mediums, you know, painting, drawing, ceramics, uh. That, that really the medium

81.can be, can be anything and that the concept is kind of driving like conceptual components

82.driving the, the material you're using.

83.

84.R: Um, and so that might be a f- a f- foreign idea to someone who isn't, you know, who

85.hasn't studied art or hasn't thought about art in a critical way. Or just in a layman's terms-

86.I: **Mm-hmm (affirmative).**

87.R: ... um, but yeah. I, the question I always get asked is, you know, the, when I tell people

88.I'm an artist people always ask like, oh what medium? Or, you know, like what's your

89.favorite material? And I'm, I'm always thinking like no that's the wrong question. The, the

90.question should be like, what's your art about? Like what's the subject matter (laughs) of

91.your art?

92.I: **Yeah.**

93.R: Because the material's interchangeable, right?

94.I: **Mm-hmm (affirmative).**

95.R: Like my background is in, in ceramics but-

96.I: **Mm-hmm (affirmative).**

97.R: ... you know, if ceramics isn't the right material to use for the concept, I use something

98.different.

99.I: **Hm. Oh, thank you. Um. You mentioned about visual in a creative way, the phrase**

100.**that-**

101.R: Mm-hmm(affirmative)

102.I: ... you, uh, used, you mentioned in the first question. Um. Would you mind to,

103.**um, provide experience or, um, example-**

104.R: Sure.

105.I: ... for that?

106.R: Sure. Um. I think there's plenty of education theory to support this, but the idea that
107.some people are drawn to numbers and thinking in mathematic ways, some people are
108.drawn to narratives and stories and thinking in like that kind of linear storytelling way.
109.And other people are drawn to or respond to, um, visual, um. I would definitely put
110.myself in, in that category, um, if that makes sense. (laughs)

111.

112.R: Um, and I think as a, as an art educator, that's, you know, that's an important factor in
113.the, you know, not just the education of, of students that fall into that digital category,
114.but also, um, establishing a literacy for, a visual literacy for students that might not
115.necessarily consider themselves a, you know, visual thinkers or, um, visual people.
116.Because whether you're a visual thinker or not, like vision is a very important part of, of
117.our experience. You know, what, what we're seeing, um. Of course talking about like the
118.eye able bodied people, right? I can't, I can't speak for blind people. I don't know what
119.that's like, but.

120.I: (laughs)

121.R: Right, like we're just visual creatures, right? We're constantly bombarded by
122.advertisements and-

123.I: Mm-hmm (affirmative).

124.R: ... and, you know, aesthetics and spaces and-

125.I: Hm.

126.R: ... without having that visual literacy to think critically about what you're seeing, um,
127.whether you're prone to it like, like I would consider myself to be prone to it or not, you
128.know. I think it's, I think it's important to include it in part of the education system.

129.I: Hm. And, um, you mentioned that, uh, visual like, that you think critically about
130.what you've seen. Um, there's, um, specifically, you know, the example or, you
131.know, thing that you, you can provide for, um, would you like to talk more about
132.that?

133.R: Um. Can you rephrase the question or, or what, like what kinda specific example?

134.I: Um. Like when, I want to know like what do you feel, what your experience
135.about, you know, when you think critically about what you've seen or the
136.experience. It can be you, what you, it can be students or-

137.R: Right.

138.I: ... when you facilitate, listen. Like anything that-

139.R: Okay. (laughs)

140.I: ... you think is important.

141.R: So I don't, I, hopefully this answers the question.

142.I: **Yeah.**

143.R: Um.

144.I: **If you don't understand my question just let me clarify.**

145.R: Um. I, and maybe this leans a little bit more towards design but for the sake of steam,

146.we'll include design in the art umbrella.

147.I: **Hm.**

148.R: Um, if, I mean you're a designer. You probably know more about that than I do.

149.(laughs)

150.I: **Hm.**

151.R: But, but like if art is the big term, I think like design is a part of that. Um. But like,

152.even today I was working on lesson plans for a materials list and I wrote out all the

153.materials but then I also added photos. Because, you know, when you look at a page of

154.text, it's, it's a page of text, right?

155.I: **(laughs) Yeah.**

156.R: Like, like the, it takes a different type of literacy to actually like understand the, the

157.words that are being, you know, and what those words represent. And then, and then you

158.can visualize it in your mind, um. But when you look at a image or color, it's, it's, uh, a

159.much more immediate read if that makes sense.

160.I: **Yeah. Um. And, um, you mentioned that, um, the, uh, you said community artist,**

161.**um, Mel Chin.**

162.R: Mm-hmm (affirmative).

163.I: **Um, that you mentioned that he inspired you in, you know, many ways.**

164.R: Mm-hmm (affirmative).

165.I: **And, um, would you mind to expand that experience? Like, it can be, um,**

166.**anything that you take from him or, you know, it can be anything that important**

167.**that you get from him or his work or anything.**

168.R: Sure. I mean, I mean it, Mel Chin is like, and has been for a long time, pushing the

169.boundaries of what art is, or what art is considered. Um. He's a very mixed media,

170.interdisciplinary artist and he's not, he's not, um, he's not shy about collaborating with

171.people outside of the discipline, right? Like I, and I really admire that 'cause I think, I th-

172.I, you know, we're not experts in everything. But if you can network with experts in

173.other fields and work together and collaborate to create something that's

174.transdisciplinary, right? It transcends both disciplines to be something new, I think Mel

175.Chin's doing that. Brandon [Balongee's 00:14:20] certainly doing that.

176.

177.R: Um, at the, you know, there's a lot of artists doing that. And the idea that like, plants

178.planted in a field absorbing lead as like a installation art project is cool. (laughs) That's
179.like-

180.I: (laughs)

181.R: ... you know, that's, that's like, that's, you know, it, it just kinda opens up all sorts of
182.doors. It's like, but what else could be an art project?

183.I: **Mm-hmm (affirmative).**

184.R: You know, or what, that can be a science project or an art project, you know. Where
185.do you start blurring the lines? And I think Mel Chin's art is as much about a rai- ways,
186.raising awareness of issues and is as much about like finding solutions to those issues.
187.Um.

188.I: **Yeah.**

189.R: Just trying to think of, I had a, I had a thought but it disappeared.

190.I: (laughs)

191.R: It'll come back to me.

192.I: **All right.**

193.R: 'Cause there's, I'm always looking at a bunch of other artists-

194.I: (laughs)

195.R: ... doing cool things. (laughs)

196.I: **Yeah. Any, you know, contemporary artists, um, are cool for me. Um. So, um, I**
197.**think you mentioned your, um, one of your project, um, that inspired from Mel**
198.**Chin.**

199.R: Mm-hmm (affirmative).

200.I: **Um, that's also about, um, uh, soil and clay.**

201.R: Mm-hmm (affirmative).

202.I: **Um, I'm sorry. That, um, what the name of the project-**

203.R: The, the project that I'm working on?

204.I: **Yes.**

205.R: The bi- so they're called biological indicators.

206.I: **Biological indicators.**

207.R: Which is actually a term borrowed from, uh, the field of biology 'cause there's these,
208.these certain species that show up given a, uh, certain environment. And so they're called
209.biological indicators. So an example of that is, uh, mayfly larvae in a stream. If you see
210.mayfly larvae in the stream, it's a biological indicator that the stream is in good health.

211.I: **Mm-hmm (affirmative).**

212.R: Because if you don't see them, it's, they're an indicator species, versus like if you see a
213.certain plant growing, maybe it's a biological indicator that the soil has high
214.concentrations of nitrogen.

215.I: **Hm.**

216.R: Um. So I made these sculptures as biological indicators because it was important for

217.me to not, um, see the surface but to let the surface develop, uh, based on the

218.environment they're placed in. So it's, it's-

219.I: **I tried to form the picture in my head.**

220.R: Yeah.

221.I: **The vision.**

222.R: So, um, all the, all the sculptures are being formulated the same way to kind of

223.encourage biological growth, um. It has a lot of calcium and magnesium and phosphate

224.in the ceramic mixture.

225.I: **Hm.**

226.R: Um, but I'm actually not seeding it. I'm just putting these pieces out into the

227.environment and different environmental and var- variabilities. So like sunlight,

228.moisture, location.

229.I: **Gotcha.**

230.R: Yeah, the different, every, each surface of the work, uh, is unique.

231.I: **Hm.**

232.R: Because each of them are indicators of different environments.

233.I: **Yeah.**

234.R: If that makes sense. (laughs)

235.I: **Yes. Yes. Yeah. I can form the picture right now. It's, um, limited edition.**

236.(laughter) **And, uh, tell me more about your role of, um, the project that you**

237.mentioned.

238.R: Um, the biological indicator project?

239.I: **Yes.**

240.R: **So that role, I really see myself as, um, as a studio artist.** You know, this, this work is

241.getting put out into environments and the hope is that, that the audience, that there is an

242.audience that will interact with the piece.

243.I: **Hm.**

244.R: And engage with the piece, but not in a, um, not in a participatory way. More, more in

245.an observer kinda way. And so that's one part of my practice. **And then another robust**

246.part of my practice is designing projects and working with students to make, make work

247.that truly is engaging and participatory, um, in a more hands on kind of, uh, tactile way.

248.I: **Yeah.**

249.R: And so I would put that less as like my studio practice and more as my

250.social/community practice.

251.I: **Um. I'm sorry. Social?**

252.R: Slash, community.

253.I: **Slash, community. Um, you mentioned, um, that, um, truly engage. Like the role**
254.**that you, um, really want students to, uh, you know, to, to get from what you**
255.**facilitate.**

256.R: Mm-hmm (affirmative).

257.I: **Um, either like in a class or the project that you, um, do with them. Um. Would**
258.**you mind to, you know, expand that, um-**

259.R: Sure.

260.I: **... truly in the-**

261.R: So I think of engagement as a spectrum, right? Lots of things can be engaging, um,
262.but to different levels. And maybe this is a bad analogy but I'm gonna-

263.I: **(laughter)**

264.R: ... I'm gonna go, go for it. Um. Like at one, imagine a picture of a, a sandwich right?

265.I: **Hm.**

266.R: There was a visual representation of a sandwich. That's the one level of engagement,
267.right?

268.I: **Yeah.**

269.R: That you are seeing the visual representation of the sandwich, you were thinking
270.about the sandwich, you're engaging with it on a very base level. Now, if we kind of lean
271.towards the middle of the engagement spectrum, imagine, imagine seeing an actual
272.sandwich and being allowed to eat it. Right? So now you're engaged in multiple ways.
273.It's not just visual anymore. It's tactile, it's sense, you know, it's you, you're tasting it,
274.you're smelling it, you're engaging with this sandwich. (laughter) And wh- I'm sorry.
275.This is such a bad analogy. (laughs) But-

276.I: **No, not at all.**

277.R: So it's a, like picture of a sandwich, low engagement. Eating the sandwich that was
278.prepared for you-

279.I: **Hm.**

280.R: ... mid engagement.

281.I: **Yeah.**

282.R: And then a high level of engagement is you actually cooking the ingredients and
283.making, putting the sandwich together, right?

284.I: **Yeah.**

285.R: And then eating it. That's a, that's like, that extra step. Like the (laughter) process, this
286.is so bad, so like I can think of a better analogy.

287.I: **I mean, it's very, um, easy to understand for me.**

288.R: Yeah.

289.I: **Um, not because, um, the language that you use or it's too broad. It's just like-**

290.R: Yeah.

291.I: **... you know, you, um, you provide that example that very, um, visual.**

292.R: Okay. (laughs)

293.I: **And, um-**

294.R: I am a very visual person, right?

295.I: **Yeah. And, um, um, I think anyone can relate to that experience.**

296.R: Okay.

297.I: **Yeah.**

298.R: Yeah. So low level-

299.I: **So thank you. (laughs)**

300.R: ... seeing the picture of the sandwich. Mid-level, eating a sandwich-

301.I: **(laughs)**

302.R: ... that someone has prepared for you.

303.I: **(laughs)**

304.R: High level, actually making the sandwich yourself.

305.I: **Yeah.**

306.R: And, and, you know, taking the bread out of the fridge and taking the, the, cutting the

307.tomatoes.

308.I: **(laughs)**

309.R: Like going through the process. Like, 'cause now you're just not engaged in a sensory

310.way.

311.I: **Yeah.**

312.R: You're engaged in a, um, in a critical way. Like you're thinking about (laughs)-

313.I: **Um. You mentioned that, uh, engaged in a, in a critical way. Um. So, would you**

314.**mind to talk more about the backwards, with the sandwich.**

315.R: (laughter)

316.I: **That, um, in a critical way, um, you know, there's, that you provide there three**

317.**steps, um, at least that you provide the example.**

318.R: Mm-hmm (affirmative).

319.I: **Like, I wanna know more about, um, that the critical way can fit in the example**

320.**that you provide in-**

321.R: Sure. So if we're, if we're talking about the (laughter)-

322.I: **Sandwich.**

323.R: ... this dumb sandwich analogy.

324.I: **Yeah.**

325.R: Maybe the first project I was talking about, that biological indicator-

326.**I: Yeah.**

327.R: ... that's, that's a low level of engagement, right? Like it's meant for the viewer to

328.view, maybe think about. Um. But, but that, that's, that's the level of engagement it

329.offers. Verse a, a project that, that I've done that had a high level of engagement for the

330.viewer, um, was ... I'm sorry. There's been like so many. I'm trying to think what would

331.be, you know, we, I, I was part of this, um, community art class. And I designed a project

332.to kind of like model to my students for wh- who were college students.

333.

334.R: And to the elementary students who we were working with, um, how to ... Sorry my

335.voice is dry. I'm gonna drink. How to-

336.**I: Sure.**

337.R: ... make, make a, um, a, a clay garden.

338.**I: Hm.**

339.R: So clay flowers to create a garden together. So we learned about the pollination of

340.bees and, and other pollinators. Like, um, you know, butterflies and beetles and flies-

341.**I: Yeah.**

342.R: ... and, and as a class, we all designed flowers made out of clay, um, with the intention

343.of making them so that bees can, can, uh, bees would be attracted to them. Right?

344.Hummingbirds would be attracted to them. Um, so it was a way about learning about

345.pollination but it was also a way of creating a work of art together. And, uh, you know,

346.it's one thing to show kids pictures in books or words in books to explain pollination.

347.**I: Mm-hmm (affirmative).**

348.R: And it's another thing to have like, their hands physically making flowers, thinking

349.about, you know, the bees that they want to come visit those flowers.

350.**I: Hm.**

351.R: Or, you know, we didn't do that in this project but like, growing a pollination garden

352.with a group of students and seeing the, seeing pollination in action is, uh, a way more

353.engaging way to learn about it as opposed to, you know, pollination happens. Here's a

354.picture in a book.

355.**I: Hm.**

356.R: Here's a bunch of words.

357.**I: Yeah.**

358.R: Um. So maybe that answers your question.

359.**I: Yes. Yeah. And, um, uh, you mentioned about the project in your community**

360.**based art class.**

361.R: Mm-hmm (affirmative).

362.**I: Um. What your goal, uh, was in the project that you mentioned?**

363.R: Um, I mean, one of the, one of the goals or objectives was to, uh, teach kids about
364.pollination. Another objective was to kind of instill this idea that an artwork can be
365.collective. So each one of us made a part of the work that then got installed as the
366.installation. And it's still up now. It's a permanent installation. So the idea that there was
367.like lots of different artist working together to make, make a work of art, um, that is
368.beyond the ownership of one person.

369.R: And, um, you know, I would still consider that with, within my art practice even
370.though I'm not the sole artist. Um, I'm okay with not being the sole-

371.I: (laughs)

372.R: ... I don't wanna be the sole artist. (laughter) I love, I love facilitating, uh-

373.I: Hm.

374.R: ... art. I love, you know, like coming up with ideas.

375.I: Hm.

376.R: Um. And maybe that leads to, you know, another objective is, was to engage with
377.youth. You know. Like maybe that, that's more of a personal objective but, to, to have a
378.connection to people that I wouldn't necessarily spend my regular time with. Right? Like
379.creating community through the act of making art together.

380.I: Hm. Um. Yeah. Uh, tell me more about a time when you worked, were
381.collaborated with as a subjects or community members.

382.R: Sure. Um. So last year I did a, um, not this past summer but the summer before, I
383.worked with Knox County Stormwater and youth from the 4H and in, uh, Knox County
384.and, um, elderly, elderly individuals who were at the Karns Senior Center. And together
385.we made a mosaic mural about Beaver Creek, which is this little creek right outside of
386.the senior citizen center. So as a group, you know, we would go down there and work
387.with the STormwater people to learn about native plants and to learn about the
388.restoration efforts. And, um, the senior citizens told stories about, you know, the creek
389.when they were young 'cause a lot of them have been in that town for a long time and
390.shared stories or memories they had about that creek.

391.

392.R: And then the students ... Or I'm sorry, not the students but the youth, were able to
393.listen to that and share their own stories they had about the creek, um, and their own
394.recollections of how it's changed. And, you know, kind of this idea of like building
395.community, building understandings and sharing stories, uh, outside of, outside of the
396.discipline, right? Like the Stormwater folks, one of them would call themselves artists
397.but they were all, you know, under my guidance and leadership working on this art
398.project with me.

399.I: Hm.

400.R: And, you know, I, I would not call myself a scientist or a-

401.I: **Hm.**

402.R: ... a Stormwater engineer.

403.I: **Hm.**

404.R: But I was able to work with them on, on, uh, on their, on, on using art to kind of

405.illustrate their concepts. Um, and using art as a form of outreach and education and

406.community building. And so with this, this coalition of people, we made the ceramic

407.tiles. Uh, most of the tiles were of the native plants and animals we learned about. And

408.then we installed this mosaic mural. So I designed the mural but it actually doesn't, it

409.doesn't happen without other people, right? Like I can't put up every single tile

410.(laughter). I'm not going to put up every single tile. So I kind of designed these murals in

411.a way that allow for a lot of flexibility and like, uh, individual input.

412.R: So I, you know, this, the kind of idea of like the artist being like the sole genius like

413.working alone in the studio-

414.I: **Hm.**

415.R: ... is kind of dumb. (laughter) Right? Like, so in, in, you know, I am the artist on this

416.project but it, and it is, and I'm using finger quotes, it's like, it is my artwork.

417.I: **Hm.**

418.R: But I'm, I'm very well aware it's not my artwork or my, just my project.

419.I: **Hm.**

420.R: It's, it's transcended what I can do.

421.I: **Hm.**

422.R: Because other people have engaged with it and have contributed their own, uh, input.

423.I: **Hm.**

424.R: And, uh, so it's something greater than, than myself.

425.I: **Hm.**

426.R: If that makes any sense.

427.I: **Yes. Yes.**

428.R: Okay. (laughter)

429.I: **Yeah. Um. You mentioned about, um, you know, you collaborate with, um, if I**

430.understand it, um, correctly, it just, um, environmental-

431.R: Mm-hmm (affirmative).

432.I: **... issues in, um-**

433.R: Yeah.

434.I: **... I- like local area.**

435.R: Mm-hmm (affirmative).

436.I: **And is that about creek, um, and Stormwater, um. I just wanna know, like, um,**

437.**you know, why or-**

438.R: Sure.

439.**I: ... it has to be that.**

440.R: Yeah. I mean, en- environmental issues and environmental, not just issues but

441.environmental celebrations are super important for me as a, as a human. Like I am just

442.very invested in, and interested in the environment, in nature, in, you know, whatever,

443.whatever the word is you wanna, uh, associate it with.

444.**I: Yeah.**

445.R: And going back to like when I was a kid, that's like, that's why I wanted to be a

446.biologist-

447.**I: (laughs)**

448.R: ... or a, or ecologist because this is what I'm interested in. But, um, you know, I'm able

449.to use art, I'm able to use an art practice to talk about those things that are important to

450.me. Um. And I'm able to use a art practice to translate those, um, environmental issues

451.from y- translate them to something outside of the sciences. Right? Like at, this is, this is

452.not gonna come out well. I'm like trying to, it's not really, I'm trying to conceive my

453.thought. Like if-

454.**I: (laughter) Yeah. It's, um-**

455.R: Like I like talking about environmental issues as an artist because-

456.**I: Hm.**

457.R: ... as a, as an artist that voice is important.

458.**I: Mm-hmm (affirmative).**

459.R: Just as important as, you know, scientists talking about environmental issues.

460.**I: Mm-hmm (affirmative).**

461.R: Um. Art is a, uh, a vehicle to understand the world and communicate about the world.

462.**I: Yeah. Thank you. That's a lot. Um. Um, I think you mentioned about, um, the**

463.**flexibilities and, um, about you and community members that, um, you did, you**

464.**know, collaborate the project together.**

465.R: Mm-hmm (affirmative).

466.**I: And, um, would you mind to expand like that experience? Like, um, it can be,**

467.**you know, how you be- balance, um, the flexibilities or it can be anything that you,**

468.**would you mind to expand about the flexibility?**

469.R: Yeah. Sure. Uh, if I understand the question correct. Um, you know, when working

470.with community, I think it's important to make ideas accessible and to meet people where

471.they're at. Um. And, and make the process both engaging but, you know, accessible.

472.**Accessibilities are really important component.** And so I'd like to think of, you know,

473.**when I'm designing these projects, I think of designing it as like a scaffolding. Or, you**

474.know, designing it as a, as a structure that, um, can be filled in. And no matter how it
475.gets filled in, the, the structure or the core of the project is still intact. Does that make
476.sense?

477.I: **Yeah. It makes sense for me. Um. You mentioned about s- scaffolding. Um.**

478.R: Mm-hmm (affirmative).

479.I: **Um. Would you mind to provide example, or?**

480.R: Um, sure. So maybe, maybe a good example like talking about the mosaic mural

481.project is, um, like the actual process of making the project is, I'll, I'll put the design on
482.the wall. And often the design is generated by collaboration and, and that's a whole other
483.part of the process. But one th- once that design is kind of, um, generated, I'll put it on
484.the wall and I'll divide the tiles out by color. And I'll give people, um, you know, a
485.bucket with color and say, this is the section that, you know, needs to be red. Um, but
486.how they choose to mosaic and what tiles they choose to use is totally up to them.

487.

488.R: Right? So you'll have some areas that are like really tightly filed, some areas that are
489.like really gaped. You'll have some people that really like, like everything being in
490.(laughs) the lines.

491.I: **Hm.**

492.R: You know what I mean? So it's kind of like I've provided the scaffolding and I've
493.provided the structure.

494.I: **Hm.**

495.R: And, and, uh, then it's just up to, up to participants in that, in that scenario to, you
496.know-

497.I: **Yeah.**

498.R: ... engage with the work that way.

499.I: **Hm.**

500.R: But throughout the project there's different modes of engagement too. So it's, you
501.know, I try and think about a mode of engagement at every level of (laughs) the project.

502.I: **(laughs) Yeah.**

503.R: If that makes sense.

504.I: **Yes. Um, just a little bit, like backward.**

505.R: Mm-hmm (affirmative).

506.I: **Um, about the scaffolding, um, the fl- flexibilities that, um, would you mind to
507.talk more about, you know, the project, um, in community based art class that you
508.mentioned?**

509.R: Sure.

510.I: **There's, you know, something about a flexibility and scaffolding, um, experience**

511.**that you wanna talk more about that?**

512.R: Sure. I mean, with the, the flower project with the community based art, it was, you
513.know, there was this instructional component, um. And, and, um, there was an instruct-
514.in- instructional component and a, a thematic focus, right? Like pollination. And after
515.that, the kind of freedom that was facilitated, or that was scaffolded in was like the
516.students were to make a, make a flower that doesn't exist, right? Like it's a flower that
517.comes from their imagination with the expressed purpose of trying to attract pollinators.
518.

519.R: So you had some flowers that, you know, some of the, some of the students' flowers
520.looked like flowers we might see regularly. And some of the students' flowers were like,
521.really crazy and outlandish and-

522.I: **(laughs)**

523.R: ... like, you know, really yeah, bright and fun.

524.I: **Mm-hmm (affirmative).**

525.R: And, and all of them were just thinking about like how, how do we wanna make this
526.so that it attracts the, the pollinators that we just learned about

527.I: **Hm.**

528.R: Um, and so yeah. Like the, the flexibility in that project is, you know, the, the
529.structure, the scaffolding is like the instructional and then the demo. And then the
530.flexibility is kind of like the, the, the parameter of like make it, make it as creative and
531.crazy-

532.I: **(laughter)**

533.R: ... as you want. And so, you know, the students like made work that, that I, I would've
534.never made on my own. But, you know, together all of us like created this, this
535.whimsical garden of-

536.I: **Hm.**

537.R: .. of, uh, clay flowers to, to attract bees.

538.I: **(laughs)**

539.R: So.

540.I: **Yeah. (laughter) Um. Tell me more about a time when you had a, a**
541.**transformational experience in collaborative art, um, with more than one discipline.**

542.R: Oh boy. Like a personal transformational experience?

543.I: **Yeah. Like it can be anything that, you know, um, you think that important to**
544.**you or, um, yeah.**

545.R: I'll have to think about this. I-

546.I: **It can be, um, for your role as a, um, artist and educator-**

547.R: Yeah. I guess-

548.I: ... um, it can be, you know, it can be-

549.R: I guess for me the transfor- (laughs) transformational experience was getting out of

550.undergrad and not being able to, like really wanting to be an art educator-

551.I: Hm.

552.R: ... but not being able to find an art education job.

553.I: Hm.

554.R: And then, um, you know, starting to work at a, at a arts nonprofit I, that focused on,

555.um, the kind of like grassroots community based art. I was like, oh I can use-

556.I: (laughs)

557.R: ... my, the skills that I learned in my undergrad as an art educator to-

558.I: Mm-hmm (affirmative).

559.R: ... do art education outside of the classroom.

560.I: Hm.

561.R: And use that as kind of like the basis to do these much larger projects. Like

562.community based projects, um. So having the art education, uh, degree gave me the tools

563.to, to, you know, transform a, uh, a studio art practice and a, you know, a pedagogical

564.practice into something that happens outside of the classroom and outside of the studio.

565.I: Mm-hmm (affirmative). And, um, would you mind to, um, talk more about, um,

566.you know, in a specific, um, collaborative art with more than one discipline, um,

567.that, um, you know, like prior you talk about, um, um, Stormwater.

568.R: Mm-hmm (affirmative).

569.I: That, um, integrate, um, environmental issues in the local area. Um, yeah, would

570.you mind to talk more about, you know, the project that you-

571.R: Just collaborating with non-

572.I: Yes.

573.R: Um, so another project I did which was another mosaic mural was, uh, a collaboration

574.with the Food Access nonprofit. And so they were really focused on, um, you know,

575.raising awareness of, of the, the, you know, nutritional health of eating vegetables.

576.Which I, you know, I could get down with that. And so I worked with them to like ride

577.around on, they have this ice cream truck that's called the vege mobile and it's actually

578.instead of selling ice cream it sells vegetables-

579.I: Hm.

580.R: ... in the same way that an ice cream truck would sell vege- or sell ice cream. And so I

581.rode around with the, with the vege truck and whenever we would stop, I would, you

582.know, ask, ask the people buying vegetables if, you know, they'd like to participate in

583.this big art project.

584.I: Hm.

585.R: And kinda tell them a little bit about it.

586.I: **Hm.**

587.R: And, you know, if they wanted to they could make a tile right then and there as, uh, a

588.tile about healthy, you know, the healthy products they were purchasing. Um. Maybe

589.that's-

590.I: **Yeah.**

591.R: ... a good example. (laughs) I don't know.

592.I: **Yeah. Um. And, um, tell me more about a project that you would consider**

593.successful.

594.R: Um. (laughter) I hope they're all successful to some, some degree. **I think the projects,**

595.I think one of the measures of success for me are, or is like the more diverse the

596.audience, the more diverse the room, the more diverse the community that is created via

597.the art making process, um, the better. Right? Like that's a, that's a good measure of

598.success. Like if, if at the end of whatever the art project is, whether it's the, the mo- a

599.mosaic mural or, you know, something that I'm doing in my own studio practice and it's

600.an exhibition, um, the more people that consider themselves not artists but are interested

601.in the artwork or, you know, participated in the making of the artwork, the better. Right?

602.Like that's a, that's a, that's a sign of success for me.

603.I: **Hm. Yeah. Um. And, um, and you, um, there's any specific, um, example for, um,**

604.you know, the diverse, you mentioned about the more diverse of the room or the

605.more diverse about community members.

606.R: Yeah.

607.I: **There's any specific, um, project or?**

608.R: Sure. I mean, I, I think we ta- like one of the projects we've talked about already, the,

609.the mosaic mural at Karns, like when we did the unveiling, you know, there was, there

610.was the, the elderly group that was representative of the senior citizen center, there were

611.politicians.

612.I: **Hm.**

613.R: There were people who go to the park and were just curious about what, what it was.

614.There were 4H students that, you know, got to interact with elderly people, which is, you

615.know, those are two, um, those are two demographics that don't necessarily get to

616.interact with each other very much.

617.I: **Hm.**

618.R: Um, outside of family.

619.I: **Yeah.**

620.R: Um, and then of course there was, you know, all the Stormwater people that were

621.there. Like again, these, you know, scientists, engineers, admins. Like people that don't

622.necessarily consider themselves artists had actively taken, um, creative, creative, uh,
623.engagement in the project.

624.I: **Yeah.**

625.R: So yeah. That like, you know, at the unveiling there were just like all these people and
626.the making of the artwork kind of created this novel community of, of, uh, you know, a
627.lot of diverse, diverse demographics and diverse disciplines.

628.I: **You mentioned about, um, creative engagement.**

629.R: Mm-hmm (affirmative).

630.I: **Um, would you mind to, to expand that, um, experience?**

631.R: Yeah j- um, in the context of the, the project we were just talking about, creative
632.engagement. Um, I mean if we're talking about the, the sandwich-

633.I: **Yeah.**

634.R: ... analogy. Creative engagement like I'm thinking like high level participatory
635.engagement and collaboration that, um, you know. We're gr- (laughs) we're growing the
636.veg- we're growing the tomatoes and cutting it together-

637.I: **(laughs)**

638.R: ... and eating the sandwich together. Like-

639.I: **Hm.**

640.R: ... right? We do, we did the planning for the project. We did the, the design for the
641.project. We, you know, we installed the project together. The, it was, you know, they did
642.a mural. The, the Stormwater people had done a mural in the past and I would say that
643.was a lower level engagement 'cause they just hired an artist to come and paint a mural
644.about, you know, the animals that live by this stream. And, you know, it's a beautiful
645.mural-

646.I: **Hm.**

647.R: ... but other than the engagement of observing it or looking at it, it was a, it was like
648.looking at a picture of the sandwich as opposed to like being a part of the process of
649.making it and eating it together. Such a bad analogy.

650.I: **(laughs)**

651.R: I'm so sorry. (laughter)

652.I: **No. Not at all. Um. Tell me more about, um, your, um, responsibilities, um, that,**
653.**uh, specific, um, project.**

654.R: Um. For that specific project, you know, my responsibilities were helping write the
655.grant, um, presenting the idea to different constituents so it, you know, presenting the
656.idea not just, uh, not just with the Stormwater people but, you know, presenting it to the,
657.the county as like something the county might wanna fund. And presenting the idea to,
658.um, the, the senior citizen center as something they'd wanna be involved in. Um, you

659.know, once that got approved, then I developed lesson plans. I developed, uh, six lesson
660.plans in collaboration with the Stormwater people, um, to learn about Beaver Creek and,
661.and, uh, and the native pol- uh, uh, the native plants. And, and vice versa, like open up
662.the discussion so that we could learn about their, you know, the, the, uh, senior citizens'
663.understanding of Beaver Creek and their experiences.

664.

665.R: Um, and so in those lessons we were making, making these tiles. So people were
666.actually like, you know, working with clay to make tiles of different things. And then
667.once all the tiles were made and everyone got to glaze the tiles too. Once all that was
668.done, um, the mural was, was designed and it was designed by a committee. So I would
669.come up with id- you know, I would like brainstorm ideas with different groups of
670.the wall for critique and people would say, well I like this, I don't like that. And so it was
671.kind of like negotiating what the de- the final design would look like. And once we
672.landed on something that everyone was like, excited about-

673.I: **Hm.**

674.R: ... and that I was excited about as the artist, you know, I, I put it up and then it was,
675.you know, my responsibility to see that the mural got installed in three weeks. And so I,
676.uh-

677.I: **Three weeks?**

678.R: Yeah, it was a three week installation. And so I was there from 8:00 in the morning
679.until 5:00 in the evening and, uh, we had, uh, we had open drop in. So anyone walking
680.by that wanted to help could. Um, and we also had, you know, a volunteer sign up. So
681.people that wanted to work on the project or make tiles on the project, you know, would
682.sign up for, for a, a time that worked for them to come and help.

683.I: **Hm. Um, you mentioned about six lesson plans. Um, that you facilitate in that,
684.um, project.**

685.R: Mm-hmm (affirmative).

686.I: **Um. Um. I wanna know about the, the, you know, the detail, um. Would you
687.mind to talk more about that?**

688.R: Sure.

689.I: **Six lesson plan.**

690.R: Sure. So, I may not be able to remember all six. It was a while ago. (laughs)

691.I: **Yeah.**

692.R: But I know, one of the lessons was about, you know, fish in the stream. And we kinda
693.learned about the different fish that people might see and, and, uh, and then they also
694.learned a technical ... 'Cause no one had worked with clay in this group. So everyone
695.learned technical things about clay too. So we did sgraffito fish. And then, you know, the

696.next lesson people got paired up in groups and, um, we learned about like the different
697.trees that would be found around the creek. And each group got to make a different tree.
698.

699.R: And so, you know, some people were making branches, some people were making
700.leaves and some people are making flowers. And their efforts together made like one
701.tree. And so it was kind of like a, a group, a group effort. Um. One of the other projects
702.was we learned about different, different flowers and their, um, their, different native
703.flowers and their, uh, Latin names. And so we made like ID tags out of clay.

704.I: **Hm. Hm.**

705.R: Um, and then another one similar to the fish, we learned about different mammals
706.and, and birds.

707.I: **Hm.**

708.R: And, you know, non fish animals that (laughter) that they would've seen. You know,
709.it's kinda like a lot of like the same thing.

710.I: **Yeah.**

711.R: Just, in just different ways. And I tried to each project introduce like, you know, one
712.of the projects we did stamping. One of the projects we did carving. One of the projects
713.we did sgraffito. I tried to with each lesson introduce a different, um, clay technique. So
714.by the end of it, you know, not only did they learn about all the ecology of, of the creek
715.right outside, but they also got to learn, uh, technical, technical skills.

716.I: **Um. Oh boy. Uh, the last question. Um, is there anything else about
717.interdisciplinary art that you'd like to tell me about or I haven't asked you about
718.today?**

719.R: Um. No. I, maybe just the, the last comment is like as an artist, I think, **I think people
720.outside of the discipline have certain expectations or certain ideas of what it is to be an
721.artist. And, um, sometimes it's hard to approach people outside of the discipline to
722.collaborate. Um, and, you know, you'll find good collaborators, you'll find people that,
723.that are excited and understand and want to do this, you know, interdisciplinary project.
724.But sometimes it's hard to find, find, um, collaborators that value, or that can see the
725.value of art for their discipline. If that makes sense.**

726.I: **Yes. Um. Yeah. And, um, yeah would you mind to talk more about that, um, um?
727.Like the, you mentioned that it's hard to approach people outside, um, the area that
728.you, you're interested in. Um, and also about, you know, approach a, people in
729.different background.**

730.R: Mm-hmm (affirmative).

731.I: **Um. Yeah. There's some specific, um, example of that, that you wanna talk more
732.about?**

733.R: Um. I mean, a, a specific examples, you know, I've, I've approached organizations and
734.kind of like, hey there's this art, art grant funding available. Like I would love to write
735.this grant and work with your organization to do some sort of project that, you know, is
736.about fish or, you know, has to do with your mission statement 'cause it's something
737.that's important to me. And people sometimes, sometimes, you know, they're just like-

738.I: **(laughs)**

739.R: ... uh what? (laughter) You know, like they don't see the potential as, uh, you know,
740.art as, as interdisciplinary outreach. Um, but it's gone vice versa too, you know. I, um,
741.I've taken, uh, classes outside of the art school and have had like great conversations with
742.the professors about how important, you know, art is to, um, their field. And they may,
743.you know, again they're like, oh you could paint a mural for me. And I'm like, oh but we
744.could, you know, collaborate on this way cooler project.

745.I: **Hm. Mm-hmm (affirmative).**

746.R: You know, that's beyond a mural.

747.I: **Hm.**

748.R: But, um, yeah. I think just because people, the idea that we're siloed into disciplines-

749.I: **Hm.**

750.R: ... um, is unfortunate. Because I think, I think, uh, you know, a, a good practice is, is
751.interdisciplinary, whatever discipline you're, you're siloed into.

752.I: **Hm.**

753.R: Right? So that's, that's all I got. (laughs)

754.I: **Yeah. Oh boy. Thank you so much.**

755.R: Yeah. (laughs)

756.I: **A word, you know, sharing your thoughts and opinions with me today and
757.helping me learn about the value and the potential of interdisciplinary art in
758.different angles, um, thought.**

759.R: Yeah.

760.I: **Um, yeah. And, um-**

761.R: Thank you for inviting me. (laughs)

762.I: **Yeah. Yeah. It is such a spatial experiences.**

763.R: (laughs)

764.I: **Yeah, that you provide.**

765.R: Cool.

766.I: **Sleepy. What time is it?**

Appendix E
Roses Interview Transcription

Coding guide:

- Emerging as an interdisciplinary art educator
- Tension between creating, teaching and researching art
- Engagement and the role of artist and audience
- Role of art in STEAM education

Interview Transcription

1. Interviewer: (I)

2. Interviewee: (R)

3. Date: August 10, 2019

4. Time: 1:00 pm- 2:00 pm

5. Place: Room 135B at John C. Hodges Library, University of Tennessee, Knoxville

6. Participant's pseudonym: Rose

7. Transcription conventions used:

8. (4.0) Timed pauses, in seconds

9. (()) Transcriber's description

10. (Laughs) Description of what was happening – extra sounds

11. The names of the programs were typed in *italics*

12. The interviewer's questions and statements are in **bold**

13.

14. **I: All right I'll keep this here.**

15. R: Okay. It's good there?

16. **I: Yeah.**

17. R: Great.

18. **I: Test, test. (Laughs).**

19. R: Test.

20. **I: All right, I'm going to start now.**

21. R: Okay

22. **I: I am going to write something down ... Um, hi.**

23. R: Hello.

24. **I: Uh, oh I forgot to ask you about, um, I- you have to use a pseudonym for- for this**

25. **study.**

26. R: Oh okay.

27. **I: Yeah. I let you choose a name because-**

28. R: We could go with the two things that are coming to mind. Either Rose or Ginger. What do

29. you like?

30.I: I like both.

31.R: I think I'll go with Rose.

32.I: Rose.

33.R: Great.

34.I: Uh, I'm going to call you Rose.

35.R: Great.

36.I: Hi Rose.

37.R: Hello.

38.I: I appreciate your help, uh, with the interview. So, um, over the last semester we have

39.gotten to know each other.

40.R: Mm-hmm (affirmative).

41.I: During this interview, feel free to tell me things that you might have mentioned

42.before.

43.R: Okay.

44.I: Also feel free to talk in as much detail as you can.

45.R: Okay.

46.I: All right. Tell me how you became interested in creating art that collaborates with

47.other areas.

48.R: Sure. Well some of it's practical, and some of it is my interest. So I, when I went to college

49.was in an art program.

50.I: Yeah.

51.R: But I always kept one foot in the design field, right? Because it's practical. But I also felt

52.like I learned a lot about how to research, how to think about where the end product is going,

53.and then I started in this program called Interactive Digital Studies, which was about digital

54.culture. And the basis of this program encouraged collaborative thinking, right, or

55.interdisciplinary thinking. And that means being both a creative and, um, a builder. A- like

56.a practical ap- applied making.

57.

58.R: So that's essentially design, right? But I guess what I mean is it taught me to research and

59.understand the digital space from a critical standpoint. So that means understanding the

60.rhetoric of the media, understanding the demographics of the industry, where the industry is

61.going, and then also making websites or digital tools that exist, um, online.

62.

63.R: And I guess I see a lot of overlaps in the path I chose for art and in my research in digital

64.studies. Because print making also has a history in media and communications. And I would

65.say that I approach art with the mindset of trying to communicate. And I think that is because

66.I think of it as in your definition of interdisciplinary, that it's something that's not just

67.aesthetic, but it's talking about a body of research that goes with it.

68.I: All right. (clears throat). You mentioned, um, art that try to communicate, the
69.mindset of that.

70.R: Mm-hmm (affirmative).

71.I: Um, where did you get that from? Would you mind to expand that?

72.R: Sure. So I think a lot of contemporary artists are doing art with a mindset of research first,

73.and then make work that comments on that. Or it expands it. (Laughs).

74.I: (Laughs).

75.R: You said expand and now I'm thinking expand. And that can happen in terms of, like,
76.mimicking the system and then creating work that my mimicking is a commentary. And I
77.think my work does that. I'm trying to think of examples for you of artists. But, um, I'm
78.getting a little sidetracked.

79.I: Um, tell me more about your role in, you know, your making, in your- your art
80.making or, um, interdisciplinary artists like in the world that, you know, do you
81.understand that?

82.R: Like my role in the world of art? Or as an educator? Or a role-

83.I: Like in, um, collaborate with other areas.

84.R: Sure.

85.I: Yeah.

86.R: Well so far I've often been the leader. So it's usually a project I have thought of. And I

87.contact someone to help me make it happen. Um, but I have worked on projects that are ...

88.that I'm not leading in that way that are more, um, I guess more collaborative. Maybe

89.someone else is leading. I worked on a project that was a digital history project for example,

90.and someone else was the writer and I designed it.

91.

92.R: Um, but I- I have sort of a unique, um, future (laughs) because I actually have a, um, job
93.lined up already. This is weird to mention, but it's something that's on my mind a lot because

94.in that position it's teaching in interactive digital studies. And the whole point of that is to

95.help students learn to work, um, very collaboratively. That everyone can play off of each

96.other's strengths to make something. And so I guess I've been thinking a lot about how to

97.make that happen in terms of how do you get students to come together on a project and each

98.play to their strengths and carry out something on a topic, you know? And I guess I'm still

99.figuring out how. But (laughs) ...

100.I: Um, you mentioned that you've been, um, doing, uh, the collaborative project with-

101.R: Yes.

102.I: ... Writer and, yeah. Would you mind to tell me more about that project?

103.R: Yes.

104.**I: Yeah.**

105.R: I can. So that project, it's called Proud and Torn. And I would say it's- it's not exactly
106.related to my art practice, but it was a great experience in learning about how to work on an
107.incredibly interdisciplinary project. So that project was written, like there's a main author
108.and her name is X. And she kind of created a team of people that
109.she wanted everyone to have equal- equal standing and we're all going to do this together.
110.But it's about the history of Hungary.

111.**I: Hungary.**

112.R: And so ... yeah. But there was also two art historians and two computer programmers, an
113 animator and myself as the designer. And so what was great about that is if I ... if she handed
114.me the writing, and I made a design, she might then respond to that and say, "I think I need
115.to change the writing because I really like what you did here by putting these photos in this
116.way. And then she'd send it back to the historian who says, "Well," and they would be like,
117."Oh we like that too and we like the way you rewrote it, but you need to also include this
118.now." So it became much more of a cycle of exchange in that way. I don't know if this is
119.helpful.

120.**I: Yes, yes.**

121.R: Okay.

122.**I: And, um, I think you mentioned that, um, is a great, um, experience that you**
123.**learned. Um, I want to know more like in the same, um, mindset that you do for your**
124.**art creation or art practice.**

125.R: Yes.

126.**I: Um, I want to know more about that. Would you mind to tell me about that?**

127.R: Yes. I'm trying to think. I feel-

128.**I: When you do it like on your own, not collaborate with other artists, but on your own**
129.**but in the mindset of that.**

130.R: Sure. Um, I guess we talked earlier about communicating as being very foundational to
131.the way I think about making work. And I liked what you were talking about earlier in
132.another conversation about design, having that mindset of okay there's going to be a user
133.that is going to need this product to function in a certain way. And I guess when I make art, I
134.think about it like could anyone walk up to this and understand a little bit of what I'm talking
135.about? And I think that's really hard to do (laughs) when you're talking about anything.
136.

137.R: But when you're researching a topic and you're also trying to say with visual and not
138.words, or with experience and not telling someone what to think. And that's different than
139.other communication tools, right? Because if you read the newspaper or you watch
140.YouTube, you're being told what someone else thinks very directly. And then you can form

141.a counter-opinion or you can agree.

142.

143.R: But what I think art does in an amazing way is that it positions a, kind of like a space for

144.talking about a subject. And so my subject is digital culture. But I think it's great that

145.someone could come up and maybe want to talk about the hand and the machine, or maybe

146.they want to talk about surveillance or they want to talk about big tech. And it's all of those

147.things, they can kind of bring up what they want to. Um, where am I going with this?

148.(Laughs). Uh, oh I think that that's very useful for students to learn. Right? I'm thinking

149.about my career as an educator. And I'm looking at how I work with programmers or how I

150.work with, um, engineers. And thinking it's so important.

151.

152.R: I guess I've been looking specifically at the course offerings and the syllabi and the lesson

153.plans for these courses in digital culture. Right? And what's so important for me is for

154.students or for anyone to be able to approach a project critically, like to have room for

155.critical reflection. And I think that's what art can bring to interdisciplinary studies. Right? It's

156.not about meeting a certain requirement or goal. It's about instilling curiosity and, um ...

157.curiosity and critical- critical thinking again. Yeah.

158.I: **Hm. Thank you. That's, whoa, that's a lot.**

159.R: Oh man yeah (laughs).

160.I: **I, uh, you mentioned that, you know, the word installing c-curiosity.**

161.R: Yeah.

162.I: **Um, would you mind to tell me about that experience in, you know, that you had that**

163.feeling or you had that experience in, you know, in terms of interdisciplinary climate?

164.R: Climate?

165.I: **Yeah.**

166.R: Yeah.

167.I: **Like interdisciplinary in, you know, in making art or, um, maybe in teaching or-**

168.R: Sure. I guess in teaching I ... and what I feel like I've been, excuse me, taught to help

169.students do is find what they're interested in talking about to communicate to make work

170.about. That it's not just that we're going to make a thing that's technical and execute it. That

171.artists in this day and age are supposed to be able to tackle a subject that other people can

172.relate to. Um, and that's what I try to teach students. Right? That they pick their own topic.

173.Like that you set a framework of here's the requirements in terms of a few things, so you feel

174.like you understand how to meet a goal. But that you can really bring in a completely

175.different perspective.

176.

177.R: **So if this student wants to do something with environmentalism, or this student wants to**

178.do something with sexuality or this one wants to do something about computers, like they
179.can all do that and just use the framework to talk about it.

180.

181.R: Um, (laughs) does that answer the question?

182.I: **Yeah. Um, yes. Uh, thank you. Um, let me go back to the, um, your, um, previous**

183.answer-

184.R: Sure.

185.I: **... That you mentioned about visual experiences.**

186.R: Yes.

187.I: **That, um, you said that is kind of really tricky, um, is hard to do, um to make people**

188.to understand, um, in a way that, you know, um ... I ... would you mind to, you know,

189.tell me more about that experience of like visual can, um, there's, um, something that

190.can contribute to, um, art making or from your perspective?

191.R: Yeah. I guess a struggle for me has been how do I talk about these complex systems and

192.my research in digital culture and still help people understand or like feel like they can

193.approach it and be like, "I kind of get what's happening here." Um, I guess I'm thinking that

194.the first body of work I made, it was sort of the end product of this process. It was about

195.computer mouse movement trackings, but all the people saw were abstract lines. And so in

196.my next several projects I started making those more interactive installations that put kind of

197.every step of the process in the gallery so that people could kind of relate to how things were

198.happening.

199.I: **Hm.**

200.R: (Laughs).

201.I: **Yeah. Um, thank you.**

202.R: Yeah.

203.I: **I think you mentioned about the, you know, the abstract outcome of the art. And,**

204.um, also the art that can communicate, um, like when you're gonna make art you want

205.to make it to communicate to, you know, audience.

206.R: Mm-hmm (affirmative).

207.I: **Uh, would you mind to tell me more about that? The balance? Or-**

208.R: Sure.

209.I: **Yeah.**

210.R: **Yes. So in a general sense, I feel like a lot of people approach art and feel like they don't**

211.get it or they can't get it. What is it? And for me that's unfortunate or it's- it's part of, um, the

212.experience of art that there's no one thing or one answer. And I do think that that's an

213.important perspective to adopt. Not just in looking at art, but that when you can accept that

214.there's a visual thing in front of you that's not telling you one thing or that the visual object

215.isn't adopting a single perspective, that it would accept multiple perspectives in return. That
216.that becomes a more fluid, um, relationship for the viewer and the artwork.

217.

218.R: And I ... that sounds a little cheesy, but that's something that I hope would be the way
219.that people can then look at each other in a very (laughs) heartwarming way, you know?

220.I: **All right. That's really good.**

221.R: (Laughs).

222.I: **Um, uh, you mentioned that um, you, um, the project, the mouse, um-**

223.R: Mm-hmm (affirmative).

224.I: **What the name again?**

225.R: Oh just the computer mouse.

226.I: **Computer mouse. Um, uh, I know for the fact that there a lot of processes in the way
227.of making and, um, there, um, like the, uh..**

228.R: Mm-hmm (affirmative).

229.I: **Yeah, all of that. Um, what your goal, um, was in the project like that you
230.mentioned.**

231.R: Oh sure.

232.I: **Yeah.**

233.R: For that one-

234.I: **Yeah.**

235.R: ... Especially, it was showing the viewer every step in the process of creating. So what I
236.mean by that is this comes from my research in digital culture. It comes from my experience
237.as a designer, right? So I used to work as a mobile applications and website designer. And
238.when you do that, you, um, you have a- a series of steps, right? That lead you to the end
239.goal. Like you first there's the design portion and then it goes into development and then it
240.goes into review. I'm forgetting what my point is here. Let's back, let me restart for a sec.
241.But it comes from ... okay.

242.I: **Rewind.**

243.R: Yeah I'm going to rewind. It does have to do with me being a designer. But it's not like
244.the specific experience. It has more to do with when I look at what a data collection process
245.is, right? At some point the data is collected and it's then translated into another form for
246.another use, and then it's bought, then it's sold. So I relate this.

247.

248.R: My examples are usually like Google Arts and Cultures face match, right? Or Facebook's
249.10 year challenge. They sort of family, right? This. They're like, "Hey come play. You give
250.us this picture and we'll show you what painting you look like." But then it becomes this
251.kind of scary moment where you might realize, "Oh, what if Google is using this to train

252. facial recognition technology." Some of the uses for facial recognition might be innocuous
253. um, sinister. Like it might be for surveillance purposes. And everything I'm saying just
254. becomes this totally complicated web as soon as you give up your photo. And it's really hard
255. all of that in what's going to happen or have any sense of control over this.

256.

257. **R:** And so why I create those physical installations that mimic that process is I hope it gives
258. some tangibility to it. Right? So the office quest is a game where you come up and you play,
259. right? Then you can see how that's translated into the abstract drawing, which I call the data.
260. It's the data art, you know? And then the data art is then for sale. You can buy it back from
261. me because I own it now because you offered your- your data to me through the game,
262. through the digital process.

263.

264. **R:** Um, there, and this is ... to relate it to like the interdisciplinary sense, um, there's different
265. words that are thrown around for this. One that I've really liked lately is called play labor.

266. **I: Play labor.**

267. **R:** So it's like companies that are using gaming tactics to entice you into, um, playing the
268. game, right? There's awards system or there's some sort of ... there's a reward system or
269. there's some sort of, um, you feel like a social gain from participating. But the companies
270. can use that information. Like a Yelp review. Let's say you contribute a Yelp review. Well
271. you're actually helping the business that is on Yelp and Yelp for free. And that's, um, maybe
272. not a big deal. But if you're contributing a lot of that, then all of that time you spent doing
273. that, it's ... they're benefiting financially from that labor, that time you put in to that. Yeah.

274. **I: Yeah. I, um, well thank you. That's really rich, you know, data.**

275. **R:** Good.

276. **I: Um, uh, I think you mentioned, um, something about, um, the [inaudible 00:25:18]**
277. **about the process like in detail like all the process.**

278. **R:** Yeah.

279. **I: And, um, and that's also, um, you mentioned that kind of like a metaphor for, you**
280. **know, selling and buying, um, data.**

281. **R:** Mm-hmm (affirmative).

282. **I: Um, I want to know more about that. Um, the, you know, the experience that you,**
283. **um, experience about that or you, um, where do you get that from. Or you know, tell**
284. **me more about that.**

285. **R:** Yeah. So I get it from my interest, my studies of digital culture. Right? I mentioned the
286. interactive digital studies program that I was a part of. And I guess I as an artist, I became
287. one because I want to talk about all of those things. Right? I want to talk about economics,
288. about ethics, about social, uh, sociological problems. Right? And I can do all of that and

289.write about it, and then also make a experience, a visual experience that's a metaphor for
290.those complex issues. Um ... yeah.

291.**I: All right. Um, you mentioned that you, um, when you think about it you, um, you**
292.**have to ensure that you can talk about this, you can do or write about this. Um, um,**
293.**would you mind to tell me more about that? That, um, when you set into, you know,**
294.**art practices, um-**

295.R: Mm-hmm (affirmative).

296.**I: Yeah. You say more like what you mentioned in this?**

297.R: Yeah. I think writing is like a sketchbook, you know? It helps me clarify the idea. It helps
298.me clarify what I'm talking about so that when I'm making the thing, it doesn't stray too far
299.from the point. Um, and I guess this is a side thought I'm having, maybe more to your last
300.question, but um, I guess I also do it because I feel like so much of our life has become
301.intangible. So making these systems a tangible experience, right, that you can, um ... When I
302.made the computer mouse pantograph, that you see that the computer or the mouse is
303.tracking you because it's physically attached to this object. You can see that as you're
304.moving, it's moving.

305.

306.R: Um, and I think we talk about these, the issue of surveillance or privacy or these complex
307.systems of the digital space a lot, you know? And it is with such abstract language. And I
308.understand that my installations themselves are quite abstract, but I do hope it brings some
309.sense of tangibility of I physically experienced this, and then can understand it.
310.

311.R: And I think that goes back to the relationship between the hand and the machine, right?
312.That there's a difference between the way we experience or learn about things by touching or
313.feeling than reading or taking in, um, unconsciously. Or like taking in ... As a standby.
314.There's a word. I'll think of it later. Bystander, I don't know. Something like that.

315.**I: All right. Um, uh, would you mind to tell me about a time when you worked or**
316.**collaborated with other subjects? Um, yeah.**

317.R: Besides digital culture?

318.**I: Uh, any-**

319.R: Or-

320.**I: ... Particularly where you feel that, um, you feel you know that there's a, um, critical,**
321.**uh, experience about that. Or anything that you want to come-**

322.R: That's collaborative.

323.**I: Mm-hmm (affirmative).**

324.R: I mean I think our class we were in was pretty-

325.**I: Yeah other subjects. That's really cool.**

326.R: Yeah. I mean we did, um, last spring the ... a project with the elementary school about
 327.environmental science, and that was really great because it, again it helped me think about
 328.how do you create a framework for someone to insert their own creativity within. And so the
 329.students became the collaborators, right? They were learning about, um, the water cycle and
 330.getting to input their own, um, ideas about that water cycle by symbolizing it themselves.
 331.And then we could use their symbols for a group mural, right? So their symbols were stamps
 332.of grass or flowers, and that became the grass. And then they also could make the, um, these
 333.raindrops that became a part of the mural and it all became about the water cycle. (Laughs).
 334.I'm just laughing because I'm hoping this translates okay.
 335.
 336.R: Um, I'm trying to think what else would be an example of collaboration though because I
 337.had mentioned the proud and torn project that I had did.
 338.I: Yeah. And you mentioned about data, um, vis- visualization project in a way, you
 339.know. Um, there's ... would you mind to tell me more about that? There's some, you
 340.know, collaborated with other subjects? Or ...
 341.R: Oh I mean ... you mean like other ... I did do my other recent project was about eye
 342.tracking.
 343.I: Hm.
 344.R: And so I tried to create a similar set up of a system where I became the, uh, puzzle maker
 345.in which I created this series of puzzles based on the children's game I Spy. And what
 346.happens in I Spy is you're looking for objects based on the directions. So you're told to look
 347.for a paper clip, and so you're looking for the paper clip. And ... but I put this on a computer
 348.with the eye tracker attached. So the viewer became this participant in my game, and they
 349.did this for free for me. (Laughs). And then uh, it, the eye tracker, the one we used is a ... it's
 350.called a Toby Pro and it's the leading eye tracking technology for commercial purposes. So
 351.looking at ... having participants look at a website and evaluate whether an advertisement
 352.was successful.
 353.
 354.R: And so with that in mind, when participants played my game, I printed off the results
 355.which are in form of data visualizations. That's like a heat map or little dots that had like
 356.lines between them and it shows where they looked as a visual. I printed that off and I sold it
 357.for 25 cents a piece. Which there's supposed to be a little humor to this, right?
 358.
 359.R: Because I think this game that the capital market economy is playing with advertising and
 360.eye tracking is kind of funny. I think there is just a lot of money being put into this
 361.technology to evaluate an advertisement. And it might work. Like it probably works a little
 362.bit to tell you something about someone's looking at or not. But was it worth it? (Laughs).

363. Was that really what we needed to be putting all of our, um, resources into evaluating is
364. whether this ad was successful in selling this bottle of Vodka? Like ... And I say that with a
365. caveat that the eye tracking is incredibly useful for, um, some studies like evaluating, uh,
366. understanding deaf students' learning capabilities, right? Um, but I just wonder at what point
367. does our technological innovation become just comical? Or like our technological
368. application. Why do we use this technology to do this when it seems silly or useless?

369. **I: Thank you.**

370. **R:** Yeah. (Laughs).

371. **I: All right, um, uh, tell me more about a time when you had a transformational**
372. **experience in collaborative art with more than one discipline.**

373. **R:** With more than one discipline.

374. **I: Yep ... I mean from what you mentioned you always do that.**

375. **R:** I think I did.

376. **I: Yeah, but ...**

377. **R:** I am looking back to the first project that this really started with, which was when I did
378. computer mouse movement tracking, it- it was my undergraduate thesis called digital action.
379. Um. I guess I had ... I just saw this connection between, um, when I was in middle school I
380. did this report on Jackson Pollock, the abstract painter. And I was arguing that there's a logic
381. and a pattern behind his work, because you can see it visually. Right? It's more of an
382. intuitive pattern, and I wanted the people of my small rural Iowa town to understand that he
383. wasn't doing this to make a joke. You know? That there was something really meaningful
384. about this motion of this arm.
385.

386. **R:** And I also in looking in college at data visualizations because those were becoming very
387. big things, saw the way those structured had this similar pattern, this essence of pattern that
388. made an idea something that was abstract marks that ...

389.

390. **R:** So my like epiphany moment that led me to forever be an interdisciplinary artist was
391. when I decided Jackson Pollock and data visualizations had a lot in common. (Laughs). And
392. that's how I ... yeah I started making the work about computer mouse movement tracking.
393. Because it's this unconscious action in the same way that Pollock is doing, um, he's trying to
394. engage the unconscious in painting. The way that interface designers and website designers
395. try to make digital space is to cater to your unconscious. It's to make it mindless, that you
396. don't have to think about how you're using the tool.

397.

398. **R:** And so that to me makes your movement, your computer mouse movement, your eye
399. movement unconscious in some respect. You're following someone else's directions. It's ...

400.yeah.

401.**I: Yeah thank you.**

402.R: Mm-hmm (affirmative).

403.**I: All right. Um, you mentioned that you, um, took, uh, an inspiration from, um, artist.**

404.**And you mentioned about, uh, logic pattern behind the work.**

405.R: Mm-hmm (affirmative).

406.**I: Um, I want to know more about that. There's, um, like, how can you find that? Or**

407.**the experience about that. Would you mind telling me more about that?**

408.R: I guess at the time that I was thinking about this, I probably was like, "I'm the only one."

409.**But (laughs), that's not true obviously. There's this wonderful, uh, website. And they made a**

410.**book. Um, it's by Manuel Lima and it's called "Visual Complexity." And he actually has a**

411.**whole section of I think the last chapter that is about abstraction and its connection to data**

412.**visualization and pattern. And so, um, that's like looking at Pollock or looking at patterns in**

413.**nature and relating it to data visualization.**

414.

415.**R: And what I liked about his commentary was he was relating it to this sort of human desire**

416.**to understand and you said it earlier actually. It's like a ... to find order. Right? This human**

417.**desire to know what the logic or the order is.** And the beauty of that question is that it's all

418.around us in nature all the time. I forget the exact word he uses, but it's a specific word that

419.is for this phenomenon. (Laughs) I was just looking at this the other day. But I think it's a

420.beautiful thing to think that because we are curious beings and we are surrounded by nature

421.and nature is so full of patterns that we're constantly looking for it in ourselves and in the

422.world around us.

423.

424.R: And I guess I get interested in when that goes into the psychology, right? Where is the

425.pattern in the unconscious or ... and I think that's what, um, a lot of data science is trying to

426.do, right? It's looking for patterns in the psychology in the unconscious mind. And the data

427.visualization is our way of representing that. So many things.

428.**I: Thank you. That's a lot.**

429.R: It is a lot.

430.**I: Um, yeah. Um, do you want to go on or do you want to pause or do you want to take**

431.**a break or ...**

432.R: What are we at? Okay.

433.**I: You still have two more?**

434.R: Let's go. Let's just go through.

435.**I: All right. Um, tell me more about a project that you would consider successful. Yeah.**

436.R: Oh man. I mean I really did ... hm, a project that's successful. I liked the computer mouse

437.movement. Um, the info collect ware. Yeah. That one to me was successful because it was
438.simpler I feel like. The mechanism was obvious. Right? You move this computer mouse and
439.the wooden attachment, the pantograph is drawing because of that. You can see it happen.
440.And I think that's what I'm going for, right? That tangibility. That I can see how the data was
441.collected. Does that make sense?

442.**I: Yeah.**

443.R: Okay. I'm trying to define success. That's hard, you know? Mm-hmm (affirmative).

444.**I: Yeah. It depends.**

445.R: It does depend. I think that's the closest to what I have been going for. That's what I could
446.say. (Laughs).

447.**I: (Laughs). Okay tell me about your, uh, process of creating that type of art that you**
448.**mentioned.**

449.R: Hm.

450.**I: Yeah. I mean like I ask again and again, but yeah.**

451.R: No it's okay. No. Well the process comes from defining a complex system. So I try to
452.identify all the steps in a system of interaction. And that often is, um, it is always related to
453.digital culture for me. It might change in the future, but ... I think I gave the example earlier
454.of these participatory games of like you upload a photo, the photo is used for to train a facial
455.recognition software. Or it's ... your data is sold. And I try to ... I try to define all those steps,
456.right? So that when I make the thing, all of the steps are clear.

457.

458.R: So I'm working on something right now where I want someone to be able to upload a
459.photo and an algorithm will translate that to a drawing, and then the drawing will be output
460.to a machine that draws it right there in the gallery in front of you.

461.

462.R: So I- I look for a way of creating a linear logic that also seems like magic. (Laughs). Like
463.you could ... I can explain it step-by-step what happened, but it also has this element of like,
464."What just happened?"

465.**I: Oh. Mary Poppin. Yeah, yeah. And yeah that's ... makes sense. Yeah.**

466.R: Yeah because I feel that way often about digital tools, right? It feels like magic in the
467.black box. But there's music coming out of there and I can text a friend. But like there's a
468.logic that can be explained as to how that's happening ...

469.**I: All right. Um, tell me more about your responsibilities in that specific project that**
470.**you mentioned.**

471.R: (Laughs) um, hm. I guess ... oh and the way that I initially interpret this question is to
472.think about my responsibility, um, as an artist to communicate or as an educator, right? That I
want people to

473.think deeply. And my responsibility is to be well-researched and be a resource to talk to
474.them about the work ...

475.**I: Um, you mentioned that, um, uh, your responsibility, you know, you, um, the artist**
476.**who can communicate and, um, make the audience to think deeply, um, critically and,**
477.**uh, to be resources, um, to talk about, uh, the work. Um, would you mind to tell me**
478.**more about that?**

479.R: Sure. So I guess in part what I feel is ... I'm sorry. I don't want to be, and I don't think my
480.practice lends itself to being an artist who's making something necessarily to sell directly.
481.Like it's not an object, it's very much an experience and its a concept. And I have thought
482.about but have not yet implemented ways of directing the viewer towards the resources that
483.could help make a change on this topic, right? So I myself try to follow the change that's
484.happening in the field I'm researching about.

485.

486.R: But it would be great for me in the future, this is a future goal, to direct viewers that come
487.see the artwork towards ... it could be anything from donating money to a political action
488.campaign that's supposed to help protect peoples privacy in a digital space. Or it could be
489.donating to a non-profit like the Center for Humane Technology. Or even directing them
490.towards, um, the Pro Publica research center. Those are the people whose work I use to ...
491.that I look at when I'm talking about the things I'm talking about. And to show people that
492.there's journalists and there's, um, scientists who are ... and law makers who are trying to
493.make the digital space safe and still useful.

494.**I: Yeah.**

495.R: I don't know.

496.**I: Thank you.**

497.R: Yes.

498.**I: All right, um, is there anything else about interdisciplinary art that you'd like to tell**
499.**me about or haven't asked about today?**

500.R: Um, hm ... I guess the only thing that's coming to mind is there's so many words (laughs),
501.there's interdisciplinary, cross-disciplinary, multi-disciplinary. And I think the one, yeah, the
502.one I think maybe I came to you thinking about was collaborative art because we've talked
503.about that a lot. And I- I think as an artist I haven't been trained as much or like schooled as
504.much in how to be collaborative. But I've sought it out as much as I can and it's a future goal
505.for me to do and to encourage as a professor. But, um, yeah. I think just in retrospect if there
506.were points in this interview where I was being like, "Collaborative, community art, inter-
507.disciplinary, it all gets shaken around. I get confused myself.

508.**I: Yeah.**

509.R: (Laughs).

510.I: You mentioned that you not, you know, like there's in the school that not .. students
511.not being taught about how to be collaborative.

512.R: Yeah.

513.I: Not that much. Um, um would you mind to tell me more about that aspect that you-

514.R: It is ... sure, yeah.

515.I: ... Shift the, you know, the perspective or the- the mindset that you mentioned that
516.you wanted to be collaborative.

517.R: Yeah.

518.I: Even though its not being taught in the school and you not being, you know, would
519.you mind to tell me more?

520.R: Yeah. So it almost feels to me like truly STEM or STEAM projects for students, the ones
521.that are supposed to be science, technology, um, engineering, art, mathematics , you know,
522.the ones that are supposed to be doing both of those things, it's always like a one week camp
523.in summer. It's never like the way that the school is structured to teach on the ground level,
524.right? Like you don't have a whole class that is cross-taught by an artist and an engineer and
525.do both most of the time. But this just an ... that's my experience and what I feel the national
526.experience probably is.

527.

528.R: And yeah when I've seen offerings for those truly cross-disciplinary courses, it's um, it's
529.usually an elective or a side. It's not the main focus of a major or a ... yeah. And I guess
530.that's partly why I'm excited about ... I told you about I have a future teaching and interactive
531.digital studies. And I'm excited about that because its foundation is to teach from both
532.perspectives, perspectives of science and art at the same time.

533.I: Mm-hmm (affirmative). Uh, you mentioned that both, that the both perspectives.

534.R: Mm-hmm (affirmative).

535.I: Um, would you mind to tell me more about the, um, balance or you know, that
536.there's a, um, um, you know how to facilitate.

537.R: Yeah.

538.I: Uh, um, you know, in a way that uh, um, equity or equality for both or yeah.

539.R: Mm-hmm (affirmative). So the foundations of the program that I'm talking about, you
540.have classes that you're learning about how to code but also how things visually function
541.together. So you might be the person who's in your foundations course you're walking along
542.and you're learning how technically to do these things. And then when you get to a higher
543.level course, you're working collaboratively. And it's all kind of group work. But you can
544.play to someone's strength.

545.

546.R: Like if you and I were working on a project and you were more the artist and I could

547.program, then we can do a project together and we can assign each other roles. But I still
548.know how to talk to you about your expertise, right? I still know why those two colors don't
549.work together when you tell me that that's not, like, that you chose these colors for this
550.reason. And you can tell me or maybe I'm struggling with a piece of code because you
551.learned code. Then I can ask you to help me look through it or like check it, you know? So
552.in that way we can both work alone but also help each other.

553.I: **Hm.**

554.R: I don't know. This is-

555.I: **This is good.**

556.R: That's the program. Um, I think the last one, um-

557.I: **Mm-hmm (affirmative).... I really want to ask you about, um, you mentioned that
558.you're gonna teach interactive digital-**

559.R: Studies.

560.I: **... Studies. Would you mind to tell me more about that?**

561.R: Sure.

562.I: **Yeah.**

563.R: So that's the program that I was originally in, in my undergrad. And, um, yeah I just have
564.a very strangely unique situation where I haven't graduated but they offered me a job there
565.when I graduate to teach. Um, but I'm excited. Because it's- it's on my role. Like I can be an
566.artist, but the primary objective of this program is about digital culture, so it's about my
567.research about all the sort of interdisciplinary work that I've been doing. And I'm excited that
568.I see that happening more and more for artists, that artists who are inter-disciplinary can be
569.hired to teach in a program that is uh, not art necessarily. Right? So it can be ... I've seen
570.artists who learned to code like self-taught then working at a place like MIT in their
571.engineering lab.
572.

573.R: Um, I've also seen artists who self-teach, teach themselves code who are now teaching at,
574.um, oh I forgot. I think it's in New York. Oh no. We'll skip that example.

575.I: **Yeah oh I have one more thing.**

576.R: Yes.

577.I: **Uh, you mentioned that, uh, interdisciplinary artists should be hired more.**

578.R: Mm-hmm (affirmative).

579.I: **Um, you know, not only in the university work. Like-**

580.R: Sure.

581.I: **... The- the- the education platform. Um, would you mind to tell me more about that
582.perspective or-**

583.R: Yeah.

584.I: Yeah.

585.R: I think just as artists become researchers more and more, that they are recognized. It

586.expands their job market, right? They can get hired somewhere for the work they're doing

587.independently in the self-taught major that uses their learned artistic skills or critical

588.evaluation or, um, visual literacy.

589.I: **Yeah ... I think that ... let me see. Yeah that would be it.**

590.R: Okay.

591.I: **Thank you so much for sharing your thoughts and openness with me today, and**

592.helping me learn about the value and the potential of inter-disciplinary art in different

593.angles, thought, your special experiences.

594.R: Thank you. I hope it was helpful ...

595.I: **Hm, hm, hm.**

596.R: Saved.

597.I: **Awesome.**

598.R: Awesome.

Appendix F
Mr. Frog's Interview Transcription

Coding guide:

- **Emerging as an interdisciplinary art educator**
- **Tension between creating, teaching and researching art**
- **Engagement and the role of artist and audience**
- **Role of art in STEAM education**

Interview Transcription

767.**Interviewer:** (I)

768.**Interviewee:** (R)

769.**Date:** August 10, 2019

770.**Time:** 1:00 pm- 2:00 pm

771.**Place:** Room 135B at John C. Hodges Library, University of Tennessee, Knoxville

772.**Participant's pseudonym:** Rose

773.**Transcription conventions used:**

774.(4.0) Timed pauses, in seconds

775.(()) Transcriber's description

776.(Laughs) Description of what was happening – extra sounds

777.The names of the programs were typed in *italics*

778.The interviewer's questions and statements are in **bold**

779.

780.**I: All right I'll keep this here.**

781.R: Okay. It's good there?

782.**I: Yeah.**

783.R: Great.

784.**I: Test, test. (Laughs).**

785.R: Test.

786.**I: All right, I'm going to start now.**

787.R: Okay

788.**I: I am going to write something down ... Um, hi.**

789.R: Hello.

790.**I: Uh, oh I forgot to ask you about, um, I- you have to use a pseudonym for- for this**

791.**study.**

792.R: Oh okay.

793.**I: Yeah. I let you choose a name because-**

794.R: We could go with the two things that are coming to mind. Either Rose or Ginger. What do

795.you like?

796.I: I like both.

797.R: I think I'll go with Rose.

798.I: Rose.

799.R: Great.

800.I: Uh, I'm going to call you Rose.

801.R: Great.

802.I: Hi Rose.

803.R: Hello.

804.I: I appreciate your help, uh, with the interview. So, um, over the last semester we have

805.gotten to know each other.

806.R: Mm-hmm (affirmative).

807.I: During this interview, feel free to tell me things that you might have mentioned

808.before.

809.R: Okay.

810.I: Also feel free to talk in as much detail as you can.

811.R: Okay.

812.I: All right. Tell me how you became interested in creating art that collaborates with

813.other areas.

814.R: Sure. Well some of it's practical, and some of it is my interest. So I, when I went to college

815.was in an art program.

816.I: Yeah.

817.R: But I always kept one foot in the design field, right? Because it's practical. But I also felt

818.like I learned a lot about how to research, how to think about where the end product is going,

819.and then I started in this program called Interactive Digital Studies, which was about digital

820.culture. And the basis of this program encouraged collaborative thinking, right, or

821.interdisciplinary thinking. And that means being both a creative and, um, a builder. A- like a

822.practical ap- applied making.

823.

824.R: So that's essentially design, right? But I guess what I mean is it taught me to research and

825.understand the digital space from a critical standpoint. So that means understanding the

826.rhetoric of the media, understanding the demographics of the industry, where the industry is

827.going, and then also making websites or digital tools that exist, um, online.

828.

829.R: And I guess I see a lot of overlaps in the path I chose for art and in my research in digital

830.studies. Because print making also has a history in media and communications. And I would

831.say that I approach art with the mindset of trying to communicate. And I think that is because

832.I think of it as in your definition of interdisciplinary, that it's something that's not just

833.aesthetic, but it's talking about a body of research that goes with it.

834.I: All right. (clears throat). You mentioned, um, art that try to communicate, the
835.mindset of that.

836.R: Mm-hmm (affirmative).

837.I: Um, where did you get that from? Would you mind to expand that?

838.R: Sure. So I think a lot of contemporary artists are doing art with a mindset of research first,
839.and then make work that comments on that. Or it expands it. (Laughs).

840.I: (Laughs).

841.R: You said expand and now I'm thinking expand. And that can happen in terms of, like,
842.mimicking the system and then creating work that my mimicking is a commentary. And I
843.think my work does that. I'm trying to think of examples for you of artists. But, um, I'm
844.getting a little sidetracked.

845.I: Um, tell me more about your role in, you know, your making, in your- your art
846.making or, um, interdisciplinary artists like in the world that, you know, do you
847.understand that?

848.R: Like my role in the world of art? Or as an educator? Or a role-

849.I: Like in, um, collaborate with other areas.

850.R: Sure.

851.I: Yeah.

852.R: Well so far I've often been the leader. So it's usually a project I have thought of. And I
853.contact someone to help me make it happen. Um, but I have worked on projects that are ...
854.that I'm not leading in that way that are more, um, I guess more collaborative. Maybe
855.someone else is leading. I worked on a project that was a digital history project for example,
856.and someone else was the writer and I designed it.

857.

858.R: Um, but I- I have sort of a unique, um, future (laughs) because I actually have a, um, job
859.lined up already. This is weird to mention, but it's something that's on my mind a lot because
860.in that position it's teaching in interactive digital studies. And the whole point of that is to
861.help students learn to work, um, very collaboratively. That everyone can play off of each
862.other's strengths to make something. And so I guess I've been thinking a lot about how to
863.make that happen in terms of how do you get students to come together on a project and each
864.play to their strengths and carry out something on a topic, you know? And I guess I'm still
865.figuring out how. But (laughs) ...

866.I: Um, you mentioned that you've been, um, doing, uh, the collaborative project with-

867.R: Yes.

868.I: ... Writer and, yeah. Would you mind to tell me more about that project?

869.R: Yes.

870.I: **Yeah.**

871.R: I can. So that project, it's called Proud and Torn. And I would say it's- it's not exactly
872.related to my art practice, but it was a great experience in learning about how to work on an
873.incredibly interdisciplinary project. So that project was written, like there's a main author
874.and her name is X. And she kind of created a team of people that
875.she wanted everyone to have equal- equal standing and we're all going to do this together.
876.But it's about the history of Hungary.

877.I: **Hungary.**

878.R: And so ... yeah. But there was also two art historians and two computer programmers, an
879 animator and myself as the designer. And so what was great about that is if I ... if she handed
880.me the writing, and I made a design, she might then respond to that and say, "I think I need
881.to change the writing because I really like what you did here by putting these photos in this
882.way. And then she'd send it back to the historian who says, "Well," and they would be like,
883."Oh we like that too and we like the way you rewrote it, but you need to also include this
884.now." So it became much more of a cycle of exchange in that way. I don't know if this is
885.helpful.

886.I: **Yes, yes.**

887.R: Okay.

888.I: **And, um, I think you mentioned that, um, is a great, um, experience that you
889.learned. Um, I want to know more like in the same, um, mindset that you do for your
890.art creation or art practice.**

891.R: Yes.

892.I: **Um, I want to know more about that. Would you mind to tell me about that?**

893.R: Yes. I'm trying to think. I feel-

894.I: **When you do it like on your own, not collaborate with other artists, but on your own
895.but in the mindset of that.**

896.R: Sure. Um, I guess we talked earlier about communicating as being very foundational to
897.the way I think about making work. And I liked what you were talking about earlier in
898.another conversation about design, having that mindset of okay there's going to be a user
899.that is going to need this product to function in a certain way. And I guess when I make art, I
900.think about it like could anyone walk up to this and understand a little bit of what I'm talking
901.about? And I think that's really hard to do (laughs) when you're talking about anything.
902.

903.R: **But when you're researching a topic and you're also trying to say with visual and not
904.words, or with experience and not telling someone what to think. And that's different than
905.other communication tools, right?** Because if you read the newspaper or you watch
906.YouTube, you're being told what someone else thinks very directly. And then you can form

907.a counter-opinion or you can agree.

908.

909.R: But what I think art does in an amazing way is that it positions a, kind of like a space for

910.talking about a subject. And so my subject is digital culture. But I think it's great that

911.someone could come up and maybe want to talk about the hand and the machine, or maybe

912.they want to talk about surveillance or they want to talk about big tech. And it's all of those

913.things, they can kind of bring up what they want to. Um, where am I going with this?

914.(Laughs). Uh, oh I think that that's very useful for students to learn. Right? I'm thinking

915.about my career as an educator. And I'm looking at how I work with programmers or how I

916.work with, um, engineers. And thinking it's so important.

917.

918.R: I guess I've been looking specifically at the course offerings and the syllabi and the lesson

919.plans for these courses in digital culture. Right? And what's so important for me is for

920.students or for anyone to be able to approach a project critically, like to have room for

921.critical reflection. And I think that's what art can bring to interdisciplinary studies. Right? It's

922.not about meeting a certain requirement or goal. It's about instilling curiosity and, um ...

923.curiosity and critical- critical thinking again. Yeah.

924.I: **Hm. Thank you. That's, whoa, that's a lot.**

925.R: Oh man yeah (laughs).

926.I: **I, uh, you mentioned that, you know, the word installing c-curiosity.**

927.R: Yeah.

928.I: **Um, would you mind to tell me about that experience in, you know, that you had that**

929.feeling or you had that experience in, you know, in terms of interdisciplinary climate?

930.R: Climate?

931.I: **Yeah.**

932.R: Yeah.

933.I: **Like interdisciplinary in, you know, in making art or, um, maybe in teaching or-**

934.R: Sure. I guess in teaching I ... and what I feel like I've been, excuse me, taught to help

935.students do is find what they're interested in talking about to communicate to make work

936.about. That it's not just that we're going to make a thing that's technical and execute it. That

937.artists in this day and age are supposed to be able to tackle a subject that other people can

938.relate to. Um, and that's what I try to teach students. Right? That they pick their own topic.

939.Like that you set a framework of here's the requirements in terms of a few things, so you feel

940.like you understand how to meet a goal. But that you can really bring in a completely

941.different perspective.

942.

943.R: **So if this student wants to do something with environmentalism, or this student wants to**

944.do something with sexuality or this one wants to do something about computers, like they

945.can all do that and just use the framework to talk about it.

946.

947.R: Um, (laughs) does that answer the question?

948.I: **Yeah. Um, yes. Uh, thank you. Um, let me go back to the, um, your, um, previous**

949.answer-

950.R: Sure.

951.I: **... That you mentioned about visual experiences.**

952.R: Yes.

953.I: **That, um, you said that is kind of really tricky, um, is hard to do, um to make people**

954.to understand, um, in a way that, you know, um ... I ... would you mind to, you know,

955.tell me more about that experience of like visual can, um, there's, um, something that

956.can contribute to, um, art making or from your perspective?

957.R: Yeah. I guess a struggle for me has been how do I talk about these complex systems and

958.my research in digital culture and still help people understand or like feel like they can

959.approach it and be like, "I kind of get what's happening here." Um, I guess I'm thinking that

960.the first body of work I made, it was sort of the end product of this process. It was about

961.computer mouse movement trackings, but all the people saw were abstract lines. And so in

962.my next several projects I started making those more interactive installations that put kind of

963.every step of the process in the gallery so that people could kind of relate to how things were

964.happening.

965.I: **Hm.**

966.R: (Laughs).

967.I: **Yeah. Um, thank you.**

968.R: Yeah.

969.I: **I think you mentioned about the, you know, the abstract outcome of the art. And,**

970.um, also the art that can communicate, um, like when you're gonna make art you want

971.to make it to communicate to, you know, audience.

972.R: Mm-hmm (affirmative).

973.I: **Uh, would you mind to tell me more about that? The balance? Or-**

974.R: Sure.

975.I: **Yeah.**

976.R: **Yes. So in a general sense, I feel like a lot of people approach art and feel like they don't**

977.get it or they can't get it. What is it? And for me that's unfortunate or it's- it's part of, um, the

978.experience of art that there's no one thing or one answer. And I do think that that's an

979.important perspective to adopt. Not just in looking at art, but that when you can accept that

980.there's a visual thing in front of you that's not telling you one thing or that the visual object

981.isn't adopting a single perspective, that it would accept multiple perspectives in return. That
982.that becomes a more fluid, um, relationship for the viewer and the artwork.

983.

984.R: And I ... that sounds a little cheesy, but that's something that I hope would be the way

985.that people can then look at each other in a very (laughs) heartwarming way, you know?

986.I: **All right. That's really good.**

987.R: (Laughs).

988.I: **Um, uh, you mentioned that um, you, um, the project, the mouse, um-**

989.R: Mm-hmm (affirmative).

990.I: **What the name again?**

991.R: Oh just the computer mouse.

992.I: **Computer mouse. Um, uh, I know for the fact that there a lot of processes in the way**

993.**of making and, um, there, um, like the, uh..**

994.R: Mm-hmm (affirmative).

995.I: **Yeah, all of that. Um, what your goal, um, was in the project like that you**

996.**mentioned.**

997.R: Oh sure.

998.I: **Yeah.**

999.R: For that one-

1000.I: **Yeah.**

1001.R: ... Especially, it was showing the viewer every step in the process of creating. So what I

1002.mean by that is this comes from my research in digital culture. It comes from my experience

1003.as a designer, right? So I used to work as a mobile applications and website designer. And

1004.when you do that, you, um, you have a- a series of steps, right? That lead you to the end

1005.goal. Like you first there's the design portion and then it goes into development and then it

1006.**goes into review.** I'm forgetting what my point is here. Let's back, let me restart for a sec.

1007.But it comes from ... okay.

1008.I: **Rewind.**

1009.R: Yeah I'm going to rewind. It does have to do with me being a designer. **But it's not like**

1010.the specific experience. It has more to do with when I look at what a data collection process

1011.is, right? At some point the data is collected and it's then translated into another form for

1012.another use, and then it's bought, then it's sold. So I relate this.

1013.

1014.R: My examples are usually like Google Arts and Cultures face match, right? Or Facebook's

1015.10 year challenge. They sort of family, right? This. They're like, "Hey come play. You give

1016.us this picture and we'll show you what painting you look like." But then it becomes this

1017.kind of scary moment where you might realize, "Oh, what if Google is using this to train

1018. facial recognition technology." Some of the uses for facial recognition might be innocuous
1019. um, sinister. Like it might be for surveillance purposes. And everything I'm saying just
1020. becomes this totally complicated web as soon as you give up your photo. And it's really hard
1021. all of that in what's going to happen or have any sense of control over this.

1022.

1023.R: And so why I create those physical installations that mimic that process is I hope it gives
1024. some tangibility to it. Right? So the office quest is a game where you come up and you play,
1025. right? Then you can see how that's translated into the abstract drawing, which I call the data.
1026. It's the data art, you know? And then the data art is then for sale. You can buy it back from
1027. me because I own it now because you offered your- your data to me through the game,
1028. through the digital process.

1029.

1030.R: Um, there, and this is ... to relate it to like the interdisciplinary sense, um, there's different
1031. words that are thrown around for this. One that I've really liked lately is called play labor.

1032.I: **Play labor.**

1033.R: So it's like companies that are using gaming tactics to entice you into, um, playing the
1034. game, right? There's awards system or there's some sort of ... there's a reward system or
1035. there's some sort of, um, you feel like a social gain from participating. But the companies
1036. can use that information. Like a Yelp review. Let's say you contribute a Yelp review. Well
1037. you're actually helping the business that is on Yelp and Yelp for free. And that's, um, maybe
1038. not a big deal. But if you're contributing a lot of that, then all of that time you spent doing
1039. that, it's ... they're benefiting financially from that labor, that time you put in to that. Yeah.

1040.I: **Yeah. I, um, well thank you. That's really rich, you know, data.**

1041.R: Good.

1042.I: **Um, uh, I think you mentioned, um, something about, um, the [inaudible 00:25:18]
1043. about the process like in detail like all the process.**

1044.R: Yeah.

1045.I: **And, um, and that's also, um, you mentioned that kind of like a metaphor for, you
1046. know, selling and buying, um, data.**

1047.R: Mm-hmm (affirmative).

1048.I: **Um, I want to know more about that. Um, the, you know, the experience that you,
1049. um, experience about that or you, um, where do you get that from. Or you know, tell
1050. me more about that.**

1051.R: Yeah. So I get it from my interest, my studies of digital culture. Right? I mentioned the
1052. interactive digital studies program that I was a part of. And I guess I as an artist, I became
1053. one because I want to talk about all of those things. Right? I want to talk about economics,
1054. about ethics, about social, uh, sociological problems. Right? And I can do all of that and

1055.write about it, and then also make a experience, a visual experience that's a metaphor for
1056.those complex issues. Um ... yeah.

1057.**I: All right. Um, you mentioned that you, um, when you think about it you, um, you**
1058.**have to ensure that you can talk about this, you can do or write about this. Um, um,**
1059.**would you mind to tell me more about that? That, um, when you set into, you know,**
1060.**art practices, um-**

1061.R: Mm-hmm (affirmative).

1062.**I: Yeah. You say more like what you mentioned in this?**

1063.R: Yeah. I think writing is like a sketchbook, you know? It helps me clarify the idea. It helps
1064.me clarify what I'm talking about so that when I'm making the thing, it doesn't stray too far
1065.from the point. Um, and I guess this is a side thought I'm having, maybe more to your last
1066.question, but um, I guess I also do it because I feel like so much of our life has become
1067.intangible. So making these systems a tangible experience, right, that you can, um ... When I
1068.made the computer mouse pantograph, that you see that the computer or the mouse is
1069.tracking you because it's physically attached to this object. You can see that as you're
1070.moving, it's moving.

1071.

1072.R: Um, and I think we talk about these, the issue of surveillance or privacy or these complex
1073.systems of the digital space a lot, you know? And it is with such abstract language. And I
1074.understand that my installations themselves are quite abstract, but I do hope it brings some
1075.sense of tangibility of I physically experienced this, and then can understand it.
1076.

1077.R: And I think that goes back to the relationship between the hand and the machine, right?
1078.That there's a difference between the way we experience or learn about things by touching or
1079.feeling than reading or taking in, um, unconsciously. Or like taking in ... As a standby.
1080.There's a word. I'll think of it later. Bystander, I don't know. Something like that.

1081.**I: All right. Um, uh, would you mind to tell me about a time when you worked or**
1082.**collaborated with other subjects? Um, yeah.**

1083.R: Besides digital culture?

1084.**I: Uh, any-**

1085.R: Or-

1086.**I: ... Particularly where you feel that, um, you feel you know that there's a, um, critical,**
1087.**uh, experience about that. Or anything that you want to come-**

1088.R: That's collaborative.

1089.**I: Mm-hmm (affirmative).**

1090.R: I mean I think our class we were in was pretty-

1091.**I: Yeah other subjects. That's really cool.**

1092.R: Yeah. I mean we did, um, last spring the ... a project with the elementary school about
 1093.environmental science, and that was really great because it, again it helped me think about
 1094.how do you create a framework for someone to insert their own creativity within. And so the
 1095.students became the collaborators, right? They were learning about, um, the water cycle and
 1096.getting to input their own, um, ideas about that water cycle by symbolizing it themselves.
 1097.And then we could use their symbols for a group mural, right? So their symbols were stamps
 1098.of grass or flowers, and that became the grass. And then they also could make the, um, these
 1099.raindrops that became a part of the mural and it all became about the water cycle. (Laughs).
 1100.I'm just laughing because I'm hoping this translates okay.
 1101.
 1102.R: Um, I'm trying to think what else would be an example of collaboration though because I
 1103.had mentioned the proud and torn project that I had did.
 1104.I: **Yeah. And you mentioned about data, um, vis- visualization project in a way, you**
 1105.**know. Um, there's ... would you mind to tell me more about that? There's some, you**
 1106.**know, collaborated with other subjects? Or ...**
 1107.R: Oh I mean ... you mean like other ... I did do my other recent project was about eye
 1108.tracking.
 1109.I: **Hm.**
 1110.R: And so I tried to create a similar set up of a system where I became the, uh, puzzle maker
 1111.in which I created this series of puzzles based on the children's game I Spy. And what
 1112.happens in I Spy is you're looking for objects based on the directions. So you're told to look
 1113.for a paper clip, and so you're looking for the paper clip. And ... but I put this on a computer
 1114.with the eye tracker attached. So the viewer became this participant in my game, and they
 1115.did this for free for me. (Laughs). And then uh, it, the eye tracker, the one we used is a ... it's
 1116.called a Toby Pro and it's the leading eye tracking technology for commercial purposes. So
 1117.looking at ... having participants look at a website and evaluate whether an advertisement
 1118.was successful.
 1119.
 1120.R: And so with that in mind, when participants played my game, I printed off the results
 1121.which are in form of data visualizations. That's like a heat map or little dots that had like
 1122.lines between them and it shows where they looked as a visual. I printed that off and I sold it
 1123.for 25 cents a piece. Which there's supposed to be a little humor to this, right?
 1124.
 1125.R: Because I think this game that the capital market economy is playing with advertising and
 1126.eye tracking is kind of funny. I think there is just a lot of money being put into this
 1127.technology to evaluate an advertisement. And it might work. Like it probably works a little
 1128.bit to tell you something about someone's looking at or not. But was it worth it? (Laughs).

1129. Was that really what we needed to be putting all of our, um, resources into evaluating is
1130. whether this ad was successful in selling this bottle of Vodka? Like ... And I say that with a
1131. caveat that the eye tracking is incredibly useful for, um, some studies like evaluating, uh,
1132. understanding deaf students' learning capabilities, right? Um, but I just wonder at what point
1133. does our technological innovation become just comical? Or like our technological
1134. application. Why do we use this technology to do this when it seems silly or useless?

1135. **I: Thank you.**

1136. **R:** Yeah. (Laughs).

1137. **I: All right, um, uh, tell me more about a time when you had a transformational**
1138. **experience in collaborative art with more than one discipline.**

1139. **R:** With more than one discipline.

1140. **I: Yep ... I mean from what you mentioned you always do that.**

1141. **R:** I think I did.

1142. **I: Yeah, but ...**

1143. **R:** I am looking back to the first project that this really started with, which was when I did
1144. computer mouse movement tracking, it- it was my undergraduate thesis called digital action.
1145. Um. I guess I had ... I just saw this connection between, um, when I was in middle school I
1146. did this report on Jackson Pollock, the abstract painter. And I was arguing that there's a logic
1147. and a pattern behind his work, because you can see it visually. Right? It's more of an
1148. intuitive pattern, and I wanted the people of my small rural Iowa town to understand that he
1149. wasn't doing this to make a joke. You know? That there was something really meaningful
1150. about this motion of this arm.

1151.

1152. **R:** And I also in looking in college at data visualizations because those were becoming very
1153. big things, saw the way those structured had this similar pattern, this essence of pattern that
1154. made an idea something that was abstract marks that ...

1155.

1156. **R:** So my like epiphany moment that led me to forever be an interdisciplinary artist was
1157. when I decided Jackson Pollock and data visualizations had a lot in common. (Laughs). And
1158. that's how I ... yeah I started making the work about computer mouse movement tracking.
1159. Because it's this unconscious action in the same way that Pollock is doing, um, he's trying to
1160. engage the unconscious in painting. The way that interface designers and website designers
1161. try to make digital space is to cater to your unconscious. It's to make it mindless, that you
1162. don't have to think about how you're using the tool.

1163.

1164. **R:** And so that to me makes your movement, your computer mouse movement, your eye
1165. movement unconscious in some respect. You're following someone else's directions. It's ...

1166.yeah.

1167.I: **Yeah thank you.**

1168.R: Mm-hmm (affirmative).

1169.I: **All right. Um, you mentioned that you, um, took, uh, an inspiration from, um, artist.**

1170.**And you mentioned about, uh, logic pattern behind the work.**

1171.R: Mm-hmm (affirmative).

1172.I: **Um, I want to know more about that. There's, um, like, how can you find that? Or**

1173.**the experience about that. Would you mind telling me more about that?**

1174.R: I guess at the time that I was thinking about this, I probably was like, "I'm the only one."

1175.**But (laughs), that's not true obviously. There's this wonderful, uh, website. And they made a**

1176.**book. Um, it's by Manuel Lima and it's called "Visual Complexity." And he actually has a**

1177.**whole section of I think the last chapter that is about abstraction and its connection to data**

1178.**visualization and pattern. And so, um, that's like looking at Pollock or looking at patterns in**

1179.**nature and relating it to data visualization.**

1180.

1181.R: **And what I liked about his commentary was he was relating it to this sort of human desire**

1182.**to understand and you said it earlier actually. It's like a ... to find order. Right? This human**

1183.**desire to know what the logic or the order is.** And the beauty of that question is that it's all

1184.around us in nature all the time. I forget the exact word he uses, but it's a specific word that

1185.is for this phenomenon. (Laughs) I was just looking at this the other day. But I think it's a

1186.beautiful thing to think that because we are curious beings and we are surrounded by nature

1187.and nature is so full of patterns that we're constantly looking for it in ourselves and in the

1188.world around us.

1189.

1190.R: And I guess I get interested in when that goes into the psychology, right? Where is the

1191.pattern in the unconscious or ... and I think that's what, um, a lot of data science is trying to

1192.do, right? It's looking for patterns in the psychology in the unconscious mind. And the data

1193.visualization is our way of representing that. So many things.

1194.I: **Thank you. That's a lot.**

1195.R: It is a lot.

1196.I: **Um, yeah. Um, do you want to go on or do you want to pause or do you want to take**

1197.**a break or ...**

1198.R: What are we at? Okay.

1199.I: **You still have two more?**

1200.R: Let's go. Let's just go through.

1201.I: **All right. Um, tell me more about a project that you would consider successful. Yeah.**

1202.R: Oh man. I mean I really did ... hm, a project that's successful. I liked the computer mouse

1203.movement. Um, the info collect ware. Yeah. That one to me was successful because it was
1204.simpler I feel like. The mechanism was obvious. Right? You move this computer mouse and
1205.the wooden attachment, the pantograph is drawing because of that. You can see it happen.
1206.And I think that's what I'm going for, right? That tangibility. That I can see how the data was
1207.collected. Does that make sense?

1208.I: **Yeah.**

1209.R: Okay. I'm trying to define success. That's hard, you know? Mm-hmm (affirmative).

1210.I: **Yeah. It depends.**

1211.R: It does depend. I think that's the closest to what I have been going for. That's what I could
1212.say. (Laughs).

1213.I: **(Laughs). Okay tell me about your, uh, process of creating that type of art that you**
1214.**mentioned.**

1215.R: Hm.

1216.I: **Yeah. I mean like I ask again and again, but yeah.**

1217.R: No it's okay. No. Well the process comes from defining a complex system. So I try to
1218.identify all the steps in a system of interaction. And that often is, um, it is always related to
1219.digital culture for me. It might change in the future, but ... I think I gave the example earlier
1220.of these participatory games of like you upload a photo, the photo is used for to train a facial
1221.recognition software. Or it's ... your data is sold. And I try to ... I try to define all those steps,
1222.right? So that when I make the thing, all of the steps are clear.

1223.

1224.R: So I'm working on something right now where I want someone to be able to upload a
1225.photo and an algorithm will translate that to a drawing, and then the drawing will be output
1226.to a machine that draws it right there in the gallery in front of you.

1227.

1228.R: So I- I look for a way of creating a linear logic that also seems like magic. (Laughs). Like
1229.you could ... I can explain it step-by-step what happened, but it also has this element of like,
1230."What just happened?"

1231.I: **Oh. Mary Poppin. Yeah, yeah. And yeah that's ... makes sense. Yeah.**

1232.R: Yeah because I feel that way often about digital tools, right? It feels like magic in the
1233.black box. But there's music coming out of there and I can text a friend. But like there's a
1234.logic that can be explained as to how that's happening ...

1235.I: **All right. Um, tell me more about your responsibilities in that specific project that**
1236.**you mentioned.**

1237.R: (Laughs) um, hm. I guess ... oh and the way that I initially interpret this question is to
1238.think about my responsibility, um, as an artist to communicate or as an educator, right? That I
want people to

1239.think deeply. And my responsibility is to be well-researched and be a resource to talk to
1240.them about the work ...

1241.**I: Um, you mentioned that, um, uh, your responsibility, you know, you, um, the artist**
1242.**who can communicate and, um, make the audience to think deeply, um, critically and,**
1243.**uh, to be resources, um, to talk about, uh, the work. Um, would you mind to tell me**
1244.**more about that?**

1245.R: Sure. So I guess in part what I feel is ... I'm sorry. I don't want to be, and I don't think my
1246.practice lends itself to being an artist who's making something necessarily to sell directly.
1247.Like it's not an object, it's very much an experience and its a concept. And I have thought
1248.about but have not yet implemented ways of directing the viewer towards the resources that
1249.could help make a change on this topic, right? So I myself try to follow the change that's
1250.happening in the field I'm researching about.

1251.

1252.R: But it would be great for me in the future, this is a future goal, to direct viewers that come
1253.see the artwork towards ... it could be anything from donating money to a political action
1254.campaign that's supposed to help protect peoples privacy in a digital space. Or it could be
1255.donating to a non-profit like the Center for Humane Technology. Or even directing them
1256.towards, um, the Pro Publica research center. Those are the people whose work I use to ...
1257.that I look at when I'm talking about the things I'm talking about. And to show people that
1258.there's journalists and there's, um, scientists who are ... and law makers who are trying to
1259.make the digital space safe and still useful.

1260.**I: Yeah.**

1261.R: I don't know.

1262.**I: Thank you.**

1263.R: Yes.

1264.**I: All right, um, is there anything else about interdisciplinary art that you'd like to tell**
1265.**me about or haven't asked about today?**

1266.R: Um, hm ... I guess the only thing that's coming to mind is there's so many words (laughs),
1267.there's interdisciplinary, cross-disciplinary, multi-disciplinary. And I think the one, yeah, the
1268.one I think maybe I came to you thinking about was collaborative art because we've talked
1269.about that a lot. And I- I think as an artist I haven't been trained as much or like schooled as
1270.much in how to be collaborative. But I've sought it out as much as I can and it's a future goal
1271.for me to do and to encourage as a professor. But, um, yeah. I think just in retrospect if there
1272.were points in this interview where I was being like, "Collaborative, community art, inter-
1273.disciplinary, it all gets shaken around. I get confused myself.

1274.**I: Yeah.**

1275.R: (Laughs).

1276.I: You mentioned that you not, you know, like there's in the school that not .. students
1277.not being taught about how to be collaborative.

1278.R: Yeah.

1279.I: Not that much. Um, um would you mind to tell me more about that aspect that you-

1280.R: It is ... sure, yeah.

1281.I: ... Shift the, you know, the perspective or the- the mindset that you mentioned that
1282.you wanted to be collaborative.

1283.R: Yeah.

1284.I: Even though its not being taught in the school and you not being, you know, would
1285.you mind to tell me more?

1286.R: Yeah. So it almost feels to me like truly STEM or STEAM projects for students, the ones
1287.that are supposed to be science, technology, um, engineering, art, mathematics , you know,
1288.the ones that are supposed to be doing both of those things, it's always like a one week camp
1289.in summer. It's never like the way that the school is structured to teach on the ground level,
1290.right? Like you don't have a whole class that is cross-taught by an artist and an engineer and
1291.do both most of the time. But this just an ... that's my experience and what I feel the national
1292.experience probably is.

1293.

1294.R: And yeah when I've seen offerings for those truly cross-disciplinary courses, it's um, it's
1295.usually an elective or a side. It's not the main focus of a major or a ... yeah. And I guess
1296.that's partly why I'm excited about ... I told you about I have a future teaching and interactive
1297.digital studies. And I'm excited about that because its foundation is to teach from both
1298.perspectives, perspectives of science and art at the same time.

1299.I: Mm-hmm (affirmative). Uh, you mentioned that both, that the both perspectives.

1300.R: Mm-hmm (affirmative).

1301.I: Um, would you mind to tell me more about the, um, balance or you know, that
1302.there's a, um, um, you know how to facilitate.

1303.R: Yeah.

1304.I: Uh, um, you know, in a way that uh, um, equity or equality for both or yeah.

1305.R: Mm-hmm (affirmative). So the foundations of the program that I'm talking about, you
1306.have classes that you're learning about how to code but also how things visually function
1307.together. So you might be the person who's in your foundations course you're walking along
1308.and you're learning how technically to do these things. And then when you get to a higher
1309.level course, you're working collaboratively. And it's all kind of group work. But you can
1310.play to someone's strength.

1311.

1312.R: Like if you and I were working on a project and you were more the artist and I could

1313.program, then we can do a project together and we can assign each other roles. But I still
1314.know how to talk to you about your expertise, right? I still know why those two colors don't
1315.work together when you tell me that that's not, like, that you chose these colors for this
1316.reason. And you can tell me or maybe I'm struggling with a piece of code because you
1317.learned code. Then I can ask you to help me look through it or like check it, you know? So
1318.in that way we can both work alone but also help each other.

1319.I: **Hm.**

1320.R: I don't know. This is-

1321.I: **This is good.**

1322.R: That's the program. Um, I think the last one, um-

1323.I: **Mm-hmm (affirmative).... I really want to ask you about, um, you mentioned that
1324.you're gonna teach interactive digital-**

1325.R: Studies.

1326.I: **... Studies. Would you mind to tell me more about that?**

1327.R: Sure.

1328.I: **Yeah.**

1329.R: So that's the program that I was originally in, in my undergrad. And, um, yeah I just have
1330.a very strangely unique situation where I haven't graduated but they offered me a job there
1331.when I graduate to teach. Um, but I'm excited. Because it's- it's on my role. Like I can be an
1332.artist, but the primary objective of this program is about digital culture, so it's about my
1333.research about all the sort of interdisciplinary work that I've been doing. And I'm excited that
1334.I see that happening more and more for artists, that artists who are inter-disciplinary can be
1335.hired to teach in a program that is uh, not art necessarily. Right? So it can be ... I've seen
1336.artists who learned to code like self-taught then working at a place like MIT in their
1337.engineering lab.

1338.

1339.R: Um, I've also seen artists who self-teach, teach themselves code who are now teaching at,
1340.um, oh I forgot. I think it's in New York. Oh no. We'll skip that example.

1341.I: **Yeah oh I have one more thing.**

1342.R: Yes.

1343.I: **Uh, you mentioned that, uh, interdisciplinary artists should be hired more.**

1344.R: Mm-hmm (affirmative).

1345.I: **Um, you know, not only in the university work. Like-**

1346.R: Sure.

1347.I: **... The- the- the education platform. Um, would you mind to tell me more about that
1348.perspective or-**

1349.R: Yeah.

1350.I: Yeah.

1351.R: I think just as artists become researchers more and more, that they are recognized. It

1352.expands their job market, right? They can get hired somewhere for the work they're doing

1353.independently in the self-taught major that uses their learned artistic skills or critical

1354.evaluation or, um, visual literacy.

1355.I: **Yeah ... I think that ... let me see. Yeah that would be it.**

1356.R: Okay.

1357.I: **Thank you so much for sharing your thoughts and openness with me today, and**

1358.helping me learn about the value and the potential of inter-disciplinary art in different

1359.angles, thought, your special experiences.

1360.R: Thank you. I hope it was helpful ...

1361.I: **Hm, hm, hm.**

1362.R: Saved.

1363.I: **Awesome.**

1364.R: Awesome.

Appendix G
Institutional Review Board (IRB) Approval Letter



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

August 05, 2019

Ninut Karnthaworn
UTK - Coll of Education, Hlth, & Human - Education

Re: UTK IRB-19-05319-XP

Study Title: Interdisciplinary Artist Practice: Implications for Art Education

Dear Ninut Karnthaworn:

The Human Research Protections Program (HRPP) reviewed your application for the above referenced project and determined that your application is eligible for **exempt** review under 45 CFR 46.101.

Your application has been determined to comply with proper consideration for the rights and welfare of human subjects and the regulatory requirements for the protection of human subjects. This letter constitutes full approval of your application (Version 1.1) as submitted, including:

Main consent - Version 1.1

Ninut_Recruitment Script revised - Version 1.0

Ninut_Interview Guide 5 - Version 1.0

The above listed documents have been dated and stamped approved by the IRB on 8/5/2019 for the above referenced study.

In the event that volunteers are to be recruited using solicitation materials, such as brochures, posters, web-based advertisements, etc., these materials must receive prior approval of the IRB.

Any alterations (revisions) in the protocol must be promptly submitted to and approved by the UTK Institutional Review Board prior to implementation of these revisions. You have individual responsibility for reporting to the Board in the event of unanticipated or serious adverse events and subject deaths.

Sincerely,

Institutional Review Board | Office of Research & Engagement
1534 White Avenue Knoxville, TN 37996-1529
865-974-7697 865-974-7400 fax irb.utk.edu

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Flagship Campus of the University of Tennessee System

Colleen P. Gilrane

Colleen P. Gilrane, Ph.D.
Chair

Institutional Review Board | Office of Research & Engagement
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Vita

Ninut Karnthaworn is a Masters student in the Department of Theory and Practice in Teacher Education at University of Tennessee, Knoxville. She received her Bachelors in Fine arts from Silpakorn University, Bangkok. Her primary research interests include teaching and learning of community-based art education and interdisciplinary education. Karnthaworn has trained as a community artist, educator, and designer for many years as well as assisting community and public organizations with both teaching and research duties.

Karnthaworn's mindful practice of art is rooted in a sense of curiosity and a playful approach to the multifaceted canvas of human activity and contemporary community issues.

Karnthaworn currently created campaigns as a community artist and facilitator in Bangkok and Knoxville that use visual as a vehicle to creating arts in order to raise awareness of violent communication, verbal abuse, and communication abuse that became a prominent issue in the U.S and around the world. After completing her Masters, Karnthaworn looks forward to working with educators in an applied setting.