AN EXAMINATION OF THE ROLE OF THE CREATIVE ARTS IN STUDENT SUCCESS IN NON-ARTS FIELDS

by

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ABSTRACT

This qualitative study examines how the creative process, learned through inclusion of college visual and performing arts courses, can have an impact on student success. Through narrative portraits of graduates from a midwestern community college, this research examines the relationship of their perceptions of the impact of prior college arts experience on the development of their STEM or other non-arts career success.

With workforce development and transfer preparation as two of the major missions of community colleges, pressures have mounted to develop ways to improve student success, increase graduation and transfer rates, and to prepare a more competitive workforce. Innovation and creativity are two terms described as important to future economic development by political, business, and educational leaders across the nation (Maeda, 2012; Pink, 2006; Robinson, 2005). Since the Great Recession, quickly shifting economies have reinforced the need for a post-secondary education that prepares workers who can move between industries in a more adaptable and creative ways. This research explores whether more experiential practice-based training in the arts can address this need (Carnevale, Smith, & Strohl, June 2010).

The resulting narratives revealed student perceptions of their college arts experiences played in later educational and professional success. The results were coded and analyzed revealing three majors themes: structure, emotion, and transition. Findings suggest that experiential arts courses can strengthen skills in patience, persistence, improved communication, collaboration, and understanding complex systems.

Recommendations include potential curricular changes to general education. Due to the small sample size, further research is recommended and should include a larger sample size, and quantitative data as permitted. Implications from this research suggest potential changes to general education requirements in order to take advantage of the benefits that experiential visual and performing arts courses offer in terms of student persistence, adaptability, and professional success.

Keywords: creativity, visual arts, performing arts, student success, retention, community colleges, engagement, creative thinking.

DEDICATION

This dissertation is dedicated to my late husband, Keith E. Fulmer, who helped launch me on this journey to complete my doctorate, and inspired me to see the creative potential in everyone.

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INTRODUCTION

Innovation and creativity are two terms expressed as important to future economic development by both political and educational leaders across the nation (Maeda, 2012; Pink, 2006; Robinson, 2005). With workforce development and transfer preparation as two of the major missions of community colleges, pressures are mounting to develop ways to improve student success, increase graduation and transfer rates at these institutions, and to prepare a more competitive workforce. This study examines how the creative process as learned through the inclusion of visual and performing arts in college core curriculum can have a positive impact on student success both throughout their educational experience, and later in their career development.

As the nation's economic pressures have mounted over recent years, the goal of increasing college graduation rates – especially at community colleges – has become a national agenda item under President Obama (Humphreys, 2012). According to some reports (Leveille, 2006; Nemec, 2013), the U.S. education system faces the tightest scrutiny ever seen in modern history, and is reportedly no longer leading the world in academic achievement, especially in areas of retention and graduation rates. In his 2006 report, Leveille anticipated states moving towards a "performance-based funding" model with development of state-defined performance indicators (2006). As will be discussed later in this chapter, this type of funding model would have a huge impact on community

colleges that traditionally have low reported graduation rates and a high percentage of their student population who are not college ready.

Recognizing that educational attainment and success in the global economy are tightly linked, President Obama called for the United States to return as a world leader in having the highest proportion of college graduates by 2020. President Obama said in his first inaugural address: “in a global economy where the most valuable skill you can sell is your knowledge, a good education is no longer just a pathway to opportunity – it is a prerequisite” (Humphreys, 2012). Career pathways have shifted away from being primarily industry-bound before the start of the Great Recession (Carnevale, Smith, & Strohl, June 2010), reinforcing the need for career preparation at the post-secondary level to prepare workers for more occupations that can move between industries. According to the report by these Georgetown University researchers, in the sector identified as “community services and arts,” the authors predict as many as 10 million jobs will require post-secondary degrees by 2018 (Carnevale, et al., 2010). Yet citing the consequences in the housing market that led to the recent Great Recession, Adler (2011) suggests that a perspective shift in both education and business is needed. This shift would move from a pervading micro view aimed at feeding “individual greed,” towards a more macro view where individuals are imbued “inspiration inherent in passionate commitment to a higher purpose” (Adler, 2011).

Remediation & Community Colleges

Educating at least 42% of the estimated 19 million students enrolled in postsecondary education, community colleges play a major role in preparing adults entering the U.S. workforce (Knapp, Kelly-Reid, & Ginder, 2012). Yet, community colleges also work with some of the least prepared students in higher education, with an

average of 60% requiring at least one remedial course before enrolling in college level courses (Collins, 2009, 2010). At some community colleges, as many as 98% of new students are in need of at least one remedial course (Lumina Foundation, 2009). The open door has long been the mission of community colleges, allowing students of all levels of college readiness to enter their doors. Yet this open door comes with a price in the form of additional support initiatives, something that proponents for the open door say is the responsibility of community colleges to provide (Myran, 2009). Yet in spite of these initiatives, the national graduation rate in 2009 (the latest year for which data was available) at community colleges was at 29.2% based on completion of an associate degree in three years, compared with a six-year completion national average for a bachelor's degree at 55.5% (NCHEMS, 2013).

Offering remediation strategies not only increases the challenges to colleges by straining shrinking resources, but remediation requirements can also deter students from continuing their education (Collins, 2009). According to the Lumina report, among the colleges participating in their Achieving the Dream initiative, only 15% of students referred to remediation ever complete all of their remediation recommendations (Lumina Foundation, 2009). Consistent with the Lumina findings, Bain suggests that some forms of remediation can actually create feelings of poor self-worth and social withdrawal. As a result, this discourages deeper learning for students because the extrinsic motivators, which come in the form of grades, seem more important than actual learning (Bain, 2012). Student engagement, or the lack of it, therefore becomes yet another important factor for improving participation, retention, and increasing graduation rates, and requires an exploration of a variety of approaches.

The issue of student success becomes critical when we consider that in 2008 nearly 59% of all new jobs required at least an associate degree (Carnevale, A. P., Smith, N., & Strohl, J., 2010). That number is expected to increase to 63% of all jobs

requiring a postsecondary degree by 2018 (Carnevale, et al., 2010). As President Obama indicated, post-secondary education is no longer an option if one is to work beyond low-wage occupations.

Increasing Human Engagement

According to researchers and authors (Adler, 2011; Pink, 2006; Robinson, 2005; Florida, 2002), the key is to shift the direction of the American workforce, from a micro focus concentrating on building personal wealth, to a macro focus concentrating on more personal connections and creating social and meaningful engagement through work. This can potentially be achieved by capturing the power of the creative process such as that ascribed to among great leaders. Adler describes key qualities exhibited by both great leaders and great artists as including various aspects of courage: 1) to see reality, recognizing both its beauty and ugliness, even if others refuse to see; 2) to envision possibility, requiring courage to see what is possible, even when others label such aspirations as naive; and 3) inspiring people and having the courage to move them from the present reality to what is possible. These are precisely the kinds of activities needed for engaging students, creating a deeper learning environment, and building the creative and critical thinkers called upon by leaders from all sectors of business as necessary for future economic growth. Popular authors such as Daniel Pink (2006) and Richard Florida (2002) have suggested that what Pink refers to as “right-brain thinking” has the potential for a very meaningful impact on changing the dynamics of the U.S. economy. According to Florida, the increasing need for “creative competence” has become critical to success in business, even as much as organizational design and strategic management. As educators for a large portion of the American workforce, community colleges, and the students they serve, could benefit greatly by harnessing the tools necessary to achieve some measure of these same creative qualities in order to improve student success.

Creative & Innovative Thinking in Demand for STEM and the Workforce

With many efforts underway to address the improvement of postsecondary education, especially at community colleges, there has also been much fanfare from the political and business sectors on the need for a more creative and innovative thinking workforce. Yet initiatives like Race to the Top, a program focusing on improving student success in K-12 and student transitions to postsecondary education, have been described by one author as “a program whose very designation is opposed to nonlinear creative thinking” (Olien, December 6, 2013).

Educational leaders such as John Maeda, former President of the Rhode Island School of Design (RISD) and former faculty with the MIT Media Lab, a leading innovation think tank, have lead the charge in a movement to change STEM to STEAM, by adding the arts into the core training of those in the STEM fields (Science, Technology, Engineering, and Mathematics) at the university level as a way of breeding more innovative thinking among graduates. STEM is often recognized as the area of workforce development where there is the largest need (Seraphin & Carnival, 2013). “Educating the next generation of scientists, engineers, inventors, and entrepreneurs is critical to the continued leadership of United States” according to a White House science and technology policy blog (Seraphin & Carnival, 2013). But Ramirez, writing about STEM and STEAM, reminds us that creativity is a one of the primary needs for the human experience and is demonstrated by some of the most successful and innovative scientists (2013).

The arts can help the STEM fields through a variety of methods as exemplified by the San Francisco Exploratorium where they blend together art and science, seeing them as compatible and overlapping methods of inquiry. Art is seen as “... an open-ended process of investigation, speculation, imagination and experimentation”

(McDougall, 2013) that contributes to the engagement of the public in learning about human experience and scientific understanding. According to Butterwick and Lawrence writing about transformative learning approaches, the method of inquiry used within the arts leads to new ways of knowing (2009). “Arts-based processes are powerful because they tap into embodied knowing...,” the authors continue, “creat(ing) spaces for rehearsal and imaging of alternative realities” (2009).

Another perspective on the approach to inquiry that is inherent in the creative process is offered by Wall Street Journal author De Botton who calls the arts “a medium uniquely suited to helping us with some of the troubles of inner life: our desire for material things, our fear of the unknown, our longing for love, our need for hope” (November 2, 2013). “None of this is sentimental,” De Botton says. “They (artistic works) distill and concentrate the hope that we require to chart a path through the difficulties of existence” (November 2, 2013). Yet, while the arts are considered more introspective in nature, a RISD alum and art educator Steve Rueckert often takes the time to remind his students that artists are more successful in asking what they want to *know* as they explore and inquire through their work, rather than focusing on what they want to *say* through their art (Maeda, 2011). In this case, the arts help put our insecurities (about careers, health, relationships, education) into a new context and potentially discover new solutions. This becomes a powerful tool when applied in the broader context of inquiry.

Recognizing the value of visual arts experience for their medical students, major Ivy League institutions such as Yale Medical School and Harvard have conducted studies that demonstrated that exposure to the arts, and the deep observational skills involved in experiencing it, have the ability to improve young doctors’ skills for increased patient empathy and observations. These more developed observational skills led to an improved diagnostic accuracy by as much as 25% and 36% respectively amongst those

medical students who participated in the deep observational arts course. These two medical schools, along with at least 22 others, now require a participatory arts or visual literacy course of all medical students. A recent article indicated that the arts even play a role in admissions to medical school. Glatter observes “It seems that students with more ‘right brain’ qualities – related to imagery, visual and drawing skills – have begun to emerge as more successful in today’s digital, image-based world of medicine” (2013).

Apart from the Yale and Harvard studies, most of the more current research related to the value of the arts in education focuses on the K-12 system. But even these studies recognize the potential extended benefits of art immersion programs or schools with an overall arts “culture.” These studies demonstrate that such experiences enhance the quality of student outcomes, including retention, test scores, and completion (Catterall, 2009). With the national focus on the STEM fields, especially with the pressure upon community colleges to create more STEM graduates, adding the arts to the mix to make STEAM, as Maeda (2012) would propose, can make the difference in increasing student success and improving graduation rates.

Shifting to a Creative Educational Approach

The momentum in educational reform for the past decade or more, however, has been shifting drastically towards heavy standardization, most recently with the well-meaning intentions of the Common Core. Hurley, a child and adolescent psychotherapist, says that “creativity is dead” under the new common core approach to education (Hurley, 2013). Criticized by leading educators as stifling creative growth, especially at the K-12 level, where the groundwork is laid for success in higher education, the new status quo in education has been described as “test, pre-test, post-test” with students treated as data points rather than developing human beings (Ravitch,

2013). In a recent interview on the popular “Daily Show” with Jon Stewart, Diane Ravitch, author of *Reign of Error* and Research Professor of Education at New York University, described this standardization approach as a “crime against children,” one that stifles the creativity of the children and educators alike. She says that this is “because we are now so focused on testing that we are rewarding the kids who can pick the right box. And what we need for the 21st Century are the kids who think *outside* the box, not inside the box” (Ravitch, Stewart, 2013).

When reviewing research behind creative leadership, creative thinking, and many studies on transformative teaching and learning, studies suggest that the arts may be able to play an important role. Ken Bain, in his book *What the Best College Teachers Do,* described his research on “deep learning” suggesting that among the best practices he found among effective educators were those who created opportunities for “expectation failure” (2004). These educators would design their courses and assignments to “allow students to try their own thinking, come up short, receive feedback, and try again” (Bain, 2004). They do this, Bain indicates, all while promoting a sense of caring for the subject matter, creating an intrinsic motivation to improve performance, rather than depending upon grades alone. He suggests that these educators provided numerous opportunities for revisions in order to build a deeper learning experience. These examinations of subjects are tied to larger questions that bridge the fundamental concepts that challenge the learner at a meaningful level, creating deeper learning (Bain, 2004). Creating challenges to a student’s mental models, curriculum that builds in expectation failures, an entire semester’s opportunity for revisions and improvements, are part and parcel consistent with the pedagogical approach in visual and performing arts education.

Engagement & Persistance

Recognizing that student engagement is one of the best means of improving student persistence, and ultimately their success, in higher education and especially in community colleges, which serve a large proportion of students who are not college ready, authors such as Bain (2004, 2012) suggest that the overall approach to the way we teach must be adjusted. Bain indicates educators must move from creating "surface" or "strategic" learners, and instead nurture more "conceptual" or "deep learning" where students are engaged by questions that are meaningful, "beautiful," and challenge their own mental models. Surface learning, Bain says, is driven more by fear, focusing on rote memorization. Yet Bain reminds us that if we fail to understand the concepts and connections, then real learning and remembering is nearly impossible. Strategic learning, Bain suggests, is one driven more by a need for some recognition and achieving a high grade-point average, but he says that this kind of learning discourages risk-taking and innovative thinking. Bain believes that only by embracing a more conceptual approach is deep learning really achieved.

The type of teaching that Bain says encourages deep learning has historically been part of the pedagogical approach for the visual and performing arts, the kind that involves continuous feedback, coming up short, and more feedback, as opposed to basing grades simply upon test results and lecture recall (Bain, video, 2012). Engaging students in their academic discipline as early as possible has been shown to have direct implications on improving retention and completion (Grasgreen, 2011). Kay McClenney also makes the case for engaged learning in her Design Principle #5, part of her six "design principles for student success," where she states that community college education must go beyond another lecture and become more active and interactive (McClenney, 2009), an approach embedded in participatory arts curriculum. For

instance, continuous feedback comes in the form of guidance from instructors, classmates and in formal critiques. Bain's expectation failure in deeper learning is achieved in arts education by constant revision, failure, and learning that result through experimentation with new and unfamiliar techniques and visualization. These kinds of experiential learning opportunities and deep observational approaches are standard components to a practice-based arts education.

The Arts in General Education

So why have the practice-based arts not been consistently included in general education requirements in higher education and specifically community colleges? As inferred earlier in this chapter, the practice-based arts are often seen as external to any kind of workforce training, an area that makes up a large component of the community college mission. Students at community colleges, especially first-generation students, are seeking upward mobility and training for an occupation that pays beyond minimum wage, and they often see the arts as frivolous and unnecessary to workforce training. Another major roadblock to including the experiential creative courses in general education suggested by Barrett is an apparent biased belief that creativity "is a rare gift given to a select few… [where]... artists and creative thinkers are lone geniuses with innate talent who must rely on flashes of inspiration that arrive without warning" (Barrett, 2013). Public perception of teaching creativity in college has been mixed, with some students or their parents considering it a "rip-off" or akin to "paying to learn 'finger painting'" (Barrett, 2013). Often, we observe that when the arts *are* included among general education requirements, they are limited to lecture-based courses in art history that traditionally involve viewing slides in a darkened room and memorizing details related to periods in art history.

Countering the negative view of a creative education, Robinson (2005) reminds us that the public educational system is based upon an outdated factory model, one that emphasizes standardization rather than innovation. In keeping with this, a focus on workforce development at many community colleges emphasizes STEM courses, which focus mainly on direct skill building and use of industry tools and technology that are consistent with industry standards. However, as mentioned earlier, creative and critical thinking are also in demand and transferable to the ever-increasing need for innovation in business. With general education requirements treated as auxiliary to the focus of the main program in order to earn an associate degree, it is rare that any of these are directly tied to the creative areas of visual or performing arts. Yet the arts are areas of study, which by definition, address methods of experiential learning and creative thinking processes that train the mind to think in more conceptual ways (Robinson, 2005). While there is pressure from the national agenda to improve student graduation rates, Goldrick-Rab, Harris, Mazzeo, & Kienzi suggest that "innovative policies and practices that improves community college education" are key to going beyond a meaningless credential to building the critical and creative thinking that sets up graduates for future success in the workforce (2010).

In Catterall's 12-year national study (2009), there are two major learning processes that result from deeper exposure to arts. First is an assisted meta-cognition resulting in creative reflection that Catterall refers to as *conversation*. He suggests that the iterative processes inherent in art education can support transfer to other fields of study. The second process that results from arts-focused learning Catterall calls *silence,* which he believes is the "arts-related neurological development on individual abilities to accomplish non-arts tasks" (2005, p.6). Embraced by some of the top universities in the nation, such as Carnegie Mellon and Stanford, the *tools of creativity* have become a

required part of a student's education according to Barrett (2013). He states, "The goal in developing students' creative skills, say these institutions, is to train them to look at familiar problems or sets of data and view them from a fresh perspective" (Barrett, 2013). From a cognitive standpoint, authors such as Efland suggest that imagination, as another term for creativity, is an aspect of higher order thinking dealing with metaphor and *divided mind* where the arts "rarely were they taken to be active sources of insight, knowledge, or understanding" (Efland, 2003, p. 47). He concurred with what Johnson indicated were three features that were important to what he called cognitive account of imagination: categorization, schemata and narrative structure (Johnson, 1987).

Unfortunately, there is a paucity of research on the direct questions to be examined here, as there have not been many academic studies on the role of creativity in academic learning, especially in community colleges. Part of the issue may be the difficulty in stating the research problem. Instead, there have been some recent studies addressing perceptions of creativity and its importance in economic and personal success. Adobe Systems Inc. recently published a study addressing what they referred to as a *global creativity gap* (StrategyOne, 2012). Their research indicated that 80% of the respondents to their global study "feel that unlocking creativity is critical to economic growth" (Adobe, 2012). Since community colleges play a major role in educating the American workforce, tying the perceptions of value of creativity to economic growth is important. According to the Adobe study, creativity was also considered very important to society by nearly two-thirds of those surveyed. However, the study indicates that only 1 in 4 feel that they are fulfilling their potential creatively (Adobe, 2012; StrategyOne, 2012).

INTRODUCING SOME QUESTIONS

In light of the current climate in higher education and the national focus on increasing postsecondary academic success, the research undertaken here is intended to shed light on the role of the creative arts in improving student success. It is the aim of this research to determine what shared characteristics exist in those who have achieved success in their work in a non-arts-related field. Through the interviews undertaken, the study will examine how any arts experiences, especially experiential or practice-based visual and performing arts, has had an impact on success in their chosen field. If a correlation exists between the success of non-art students and the integration of their creative preparation in their careers, then we may be able to determine new and potentially innovative directions for shaping curriculum, including general education at community colleges.

Initially, I was interested in determining if there were existing studies that supported the notion that practice-based arts exposure could have a meaningful impact on a person's success in their chosen field. I believed it would be interesting to determine another element for exploration, at least at a cursory level, regarding if many two or four year institutions incorporate a practice-based art course into their general education requirements. Unfortunately, a cursory review indicates that the arts in general education are usually optional and mostly limited to art history or art appreciation courses to meet humanities requirements. Future research could benefit from deeper exploration of this trend and a comparison of student success rates of students who have or have not had any experiential arts core requirements for graduation.

As the development of the final research questions evolved, several preliminary questions became apparent. For instance, could we determine if a student's experience in a practice-based art — even at a minimal level of 1 or 2 courses (or credits) — would

impact success in their program of study, regardless of its relationship to the arts (i.e. GPA, retention, graduation rates)? The follow-up question would ask, if a practice-based arts course was made a general education requirement, could this lead to greater success among all students, especially those who are not college ready? The implications for this question are apparent when we extend this to the challenge of engaging students in their academic discipline with the potential to improve retention and completion (Grasgreen, 2011). With much educational literature focusing on the value of engagement and experiential learning as being two key areas that are vital to community college success, it seems only natural that any research where the arts may be demonstrated as improving engagement and experiential learning would be a welcome addition to the core curriculum.

In pondering the potential outcome of these preliminary questions, additional ones come to mind. For instance, for community college students who did not continue beyond one or two basic studio art courses, how did those students perceive the impact of that experience on their later career and/or quality of life? Finally, as we consider what is really being explored here, a well-rounded education that engages different modes of thinking, experiential learning and engagement, one cannot help but wonder if there is a potential for creating what I call a DaVinci Model for student learning, one that embraces the arts as a fundamental subject that resides on equal standing with other academic subjects.

FINAL RESEARCH QUESTIONS

The main research question for this study explores the issue of perception, what I believe is a critical factor when considering any changes in curriculum and the community college culture. It asks: *How important is creativity, which has been inspired by a practice-based arts experience, to students' success in their educational experience*

and career development as perceived by STEM or non-Art-majors and graduates? Related to this, we can also ask: *Do graduates from STEM or non-arts fields at a community college, who have taken one or more practice-based visual or performing arts course, believe that their prior arts experience gives them an edge on their non-art colleagues?*

While the research focuses on students and graduates from one midwestern urban community college, it has the potential for wider significance to improve student retention and persistence, factors that lead to higher graduation rates. These factors have become even more important as community colleges face greater accountability for student success under the threat of performance-based state and federal funding. As for the college where this research is being undertaken, this institution is an active participant in initiatives such as Achieving the Dream, and has received national recognition for its good practices, making this college a valuable laboratory for exploring innovative approaches to student success. A medium-sized urban community college that serves about 11,000 from the surrounding rural, suburban and urban communities, the college's mission, like many community colleges, actively addresses issues of workforce development and transfer to area universities.

SIGNIFICANCE OF THIS STUDY

The focus of this research is on the perceptions of students and graduates in non-arts fields since prior studies at the K-12 level (Catterall, 2009b) have already approached this topic from an exhaustive data-driven level, indicating strong relationships between student performance and the arts. Perceptions, however, become more important in postsecondary education as students have more choices in selecting courses outside of specific degree program and general education requirements. Since occupational programs are usually very tightly formatted in their program sequences,

that leaves electives and general education requirements where there may be some flexibility in student choices. Interviewing students who have achieved success in their fields, and who have participated in some kind of practice-based college art course, will provide some insights into how these students feel their educational experience in the arts has enhanced their career development.

My rationale for the study at hand emanates from an intense desire to find ways to facilitate transformative educational opportunities for students, built from experiences that breed the creativity required for graduates to move beyond the transient demands of the current economy. While there has been considerable focus on degree completion, achieving an associate degree in itself can be an empty objective when a student has not become fully engaged in the learning process, and expanded their experiences in the classroom beyond the semester. The transformative learning potential of the arts, as a means of awakening the creative and critical thinking needed for innovation, can have a far-reaching impact on a student's life and career.

METHODOLOGY

The research methodology utilized for this study is a variation within qualitative research called Portraiture, developed by Lawrence-Lightfoot and Davis and borrows from qualitative ethnographic studies (1997). Following this qualitative design method, observations are made within physical (internal), personal, and historical contexts. Potential limitations incurred from this methodology are in the descriptions of metaphors as defined by the portraiture researcher, thereby, according to Lawrence-Lightfoot and Davis as, putting the "portraitist's voice...everywhere" (1997). The delimitations will involve maintaining careful control over the researcher's voice so as not to overpower the subject being interviewed. Other limitations will include the accessibility of the

graduates being interviewed, determining recent contact information, and their willingness to share their stories.

The subjects interviewed were selected based upon several dependent variables, including a) completion of at least 45 credits at this midwestern community college; b) graduation from the same community college or transfer to a four-year institution; and c) enrollment and successful completion of one or more practice-based art course while attending the community college. In addition, the subjects will not be a visual or performing arts major in their most recent area of study. From the resulting list, additional criteria were used to randomly reduce the number of subjects to about 100. Using the most currently available contact information, and following good qualitative practices, a letter of introduction was sent to introduce the study and ask them to consider participating in a written survey, focus group, or one-on-one interviews. Based upon their responses, my objective was to reach 6-10 subjects using social media and other current contacts.

The goal was to conduct deeper one-on-one interviews with six subjects identified as being good candidates for developing narrative portraits. These former community college students would be willing to share how their careers have been shaped following their educational and professional experiences. Their stories were recorded by audio and/or video. Participants were asked about their educational experiences, especially where the arts played any notable role in their current success. The interviews provided an opportunity for these former community college students to reflect upon any perceived connections they felt had an impact on the trajectory of their personal and professional development. Also, in keeping with good qualitative research practices of confidentiality, the resulting data was triangulated with student data acquired from the college. After the interviews were completed, the recordings were transcribed, and the data was manifested as narrative portraits, and analyzed for patterns and

parallels across the different experiences. From this analysis, patterns and themes emerged that have led to recommendations in future educational policy, as discussed in Chapter 5.

OVERVIEW OF LITERATURE

According to recent surveys on student engagement, students are not nearly as engaged in the work that their professors would like them to be. Yet, with less than half of students reaching their academic goal of a degree or certificate, reports indicate student engagement is key to improving retention and graduation rates (Center for Community College Student Engagement, 2012). Another study identified institutions that performed well in student engagement and graduation rates in a model named DEEP (Documenting Effective Educational Practice), (Kuh, G. D., Kinzie, J., Schuh, J. H., & White, E. J., June 2010). For this study, Kuh et al also identified “active and collaborative learning” as one of the areas that improves student engagement (June, 2010).

In other disciplines, the use of visual thinking strategies has been experimented with as a means of increasing empathy and stimulating cognitive thinking (Reilly, Ring, Duke, 2005). However, these have been limited to exposing students to visual arts through looking at and speaking about art rather than being a participant of its creation. Even this, however, has shown to have some positive effect. Embraced by some of the top universities in the nation, such as Carnegie Mellon and Stanford, what Barrett calls the “tools of creativity” (2013) have become a required part of a student’s education. He further says, “The goal in developing students' creative skills, say these institutions, is to train them to look at familiar problems or sets of data and view them from a fresh perspective” (Barrett, 2013).

As mentioned earlier, there is very little research on the direct questions to be examined in this study, especially for higher education, as there are few many academic studies on the role of creativity in academic learning, especially in community colleges. Part of the issue may be the difficulty of expressing the actual research question. The following literature review examines the subject of art and its role in education and the economy from a variety of perspectives. Educational leaders such as John Maeda have taken on government policy addressing the connection of the arts to its importance in the STEM (Science, Technology, Engineering, & Math) fields. Building a movement to create STEAM by adding in the arts, Maeda makes the argument that the arts add the creative thinking and innovation components that could make the difference in a competitive economy ("STEM to STEAM," 2013; Maeda, 2012).

CONCLUSION

The research undertaken seeks to examine the role of the arts as a potential component for improving success as students move through their college studies and towards building a future successful and sustainable career. Throughout higher education, policymakers and educators have tried to define the curriculum that should be common to educating all minds regardless of their vocation. As studies have shown, there is the potential case to be made that the process of learning the arts at a more experiential practice-based level can provide a level of training that engages a manner of thinking more deeply than in other fields. By engaging this part of our intellectual capacity, we might open ourselves to more creative and innovative thinking that can augment our successful learning in other fields.

The chapters that follow provide the literature, context, methodology, analysis, conclusions, and recommendations that resulted from this study. In Chapter 2, the available literature is explored, building on the various definitions of STEM, and adding

the recently launched movement for STEAM. The literature review also examines the insights of educational leaders and popular authors who discuss the subject in regards to its impact at an economic level, including studies at the K-12 level and at prominent medical schools. In Chapter 3, the qualitative research method is introduced for this study as a variation of Portraiture. Described here is the process by which the subjects, also known as actors (Lawrence-Lightfoot & Davis, 1997), were selected for interviews. The method for conducting the interviews is also described, including length, conditions, questions, and contexts. In Chapter 4, the findings and results of the qualitative interviews are reported along with various themes that are identified. Chapter 5 describes the analysis and implications that can be determined from the research results. In this chapter, we attempt to determine the significance of the data, and provide the researcher's interpretation. A discussion is included, along with recommendations based upon potential conclusions that can be drawn from the narrative portraits and thematic analysis that make up the research data. Implications for the larger community are discussed, and an honest appraisal of the study's relevance is offered. Finally, potential next steps are identified and how new models for core curriculum may be developed and implemented. The results of this research are then linked to others that offer similar conclusions, and recommendations are made for following up with future research.

CHAPTER 2: A REVIEW OF THE LITERATURE

INTRODUCTION

Community colleges face increased scrutiny of performance measures such as GPA but especially graduation rates in spite of the varied missions and constituencies served by these institutions. With that in mind, a number of different initiatives led by major foundations, such as the Gates Foundation and Lumina Foundation, have attempted to address the completion agenda with a special focus on technology, especially online learning, and accelerated learning which attempts to mainstream underprepared students into their program coursework as quickly as possible (HCM Strategists, 2013, July 10; Lumina Foundation for Education, 2009). McClenney, Myran, O'Banion, and numerous others have called for other techniques that focus on increasing student engagement by designing programs or coursework that improve student learning (McClenney, 2009; Myran, 2009; O'Banion, 1997).

With a national agenda focusing on STEM fields, it is apparent that there are still not enough graduates to fill the anticipated need. As community colleges educate 42% of the nation's college students, they play a major role in preparing adults for entering the U.S. workforce (Knapp, Kelly-Reid, & Ginder, 2012). This is even more important considering that an estimated 63% of all jobs will require a postsecondary degree by 2018 (Carnevale, Smith, & Strohl, 2010), requiring new approaches to engage students and increase graduation rates for STEM and non-STEM fields alike.

Some research, shared later in this chapter, indicates that the visual and performing arts may prove valuable for increasing student engagement, completion

rates, and potentially, careers. The indication is that even a short immersion in the arts can promote student engagement, and improve creative thinking and problem solving in ways not emphasized in STEM fields. Since community colleges serve a high proportion of students who are generally not college ready, any effort to improve engagement, creativity, and critical thinking has the potential for long-term impacts.

In this chapter, I examine the current literature on both STEM, and its parallel effort of STEAM, to lay the groundwork for the main research undertaken for this study. Research is reviewed on the role of the arts in improving student success. As mentioned in Chapter One, the majority of the research emphasis has been in K-12, with only a few studies in higher education. Community colleges, and the students they serve, have the potential of benefiting from the research that follows.

EXAMINING STEM VERSUS STEAM

In researching the role of the arts in STEM education and moving from STEM to STEAM, there has been much written in the literature addressing STEM in its more traditional forms. The challenges come in finding research that addresses the intersection of the visual and performing arts and STEM in community colleges. While the definition of STEM is often in dispute, as indicated by the sometimes conflicting descriptions that follow later in this chapter, the value to our national economy in preparing graduates in the STEM fields is not.

According to Mangan (2013), “92% of STEM workers will need postsecondary education by 2018, and about 65% of the jobs requiring at least a bachelor’s degree.” An implication here is that the other 35% would likely require a post-high school certificate or associate degree. In her article in the *Chronicle of Higher Education* (Mangan, 2013), she also indicates that among the challenges, students at community colleges are more likely to have deficiencies in mathematics. Mangan quotes Aspen Institute’s executive

director, Josh Wyner, who said “If colleges are to meet the growing demand for graduates with math and science skills, we have to figure out a way to keep standards high while coaching more students through STEM degrees” (Mangan, 2013). The indication here is that barriers to success exist and will likely require remedial education in reading and mathematics.

Shifting Definitions for STEM

STEM serves as an acronym for Science, Technology, Engineering, and Math, and it is generally applied to the “hard” sciences. However, the American Psychological Association (APA) indicates their qualms about the behavioral and social sciences being left out of the federal government’s definition of STEM (Breckler, 2010), as mentioned in a response to a report by the Presidents Council of Advisors on Science and Technology (PCAST, 2010). Breckler cites from the original report on STEM’s importance as bolstering his contention that the government’s support of the status quo is inadequate stating, “STEM education will determine our ability as a nation to solve societal challenges in such areas as energy, health, environmental protection, and national security” (Breckler, 2010). In a PCAST report, the reference is made that STEM education is necessary to advance innovation in our country:

> It will ensure our society continues to make fundamental discoveries and to advance our understanding of ourselves, our planet, and the universe. It will generate the scientists, technologists, engineers, and mathematicians who will create the new ideas, new products, and entirely new industries of the 21st century. (PCAST, 2010, p. v)

Yet Breckler’s concern is that the justification by PCAST for not including the behavioral and social sciences in STEM K-12 plans are based on their conclusion that it

has always been that way. Breckler suggests that leaving the study of behavioral and social sciences to postsecondary STEM inclusion is shortsighted and myopic (Breckler, 2010). The PCAST definition of STEM education is

> STEM education, as used in this report, includes the subjects of mathematics, biology, chemistry, and physics, which have traditionally formed the core requirements of many state curricula at the K-12 level. In addition, the report includes other critical subjects, such as computer science, engineering, environmental science and geology, with whose fundamental concepts K-12 students should be familiar. The report does not include the social and behavioral sciences, such as economics, anthropology, and sociology; while appropriately considered STEM fields at the undergraduate and graduate levels, they involve very different issues at the K-12 level. We note that this report does not seek to define specific core or elective curricula, which are the subject of other important efforts. Our focus is on system-wide approaches for improving K-12 STEM education. (PCAST, 2010, p. 9)

In another report of the Joint Economic Committee Chairman's Staff, STEM includes life sciences, physical sciences, mathematics and statistics, computing, and engineering. They specifically excluded social sciences from their definition but acknowledged that there were differing definitions, and some included manufacturing, processing, and architecture thereby making trend analysis difficult (Casey, 2012). The report goes on to describe that "for workers to benefit from the economic gains generated by innovation, they must have the knowledge and skills needed to work effectively in jobs requiring STEM competencies" (p. 2). STEM skills, as cited in the report, are increasingly in demand by non-STEM employers. The supply of STEM graduates has not kept up with demand, and according to the report there may be cultural factors in play, including an attitude the math and science are not fashionable, especially for women.

The challenge of defining STEM was addressed in a report by the National Science Teachers Association, a K-12 science education organization (Gerlach, 2012). Gerlach quotes Tsupros (2009): "...an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, and mathematics in contexts that make connections between school, community, work, and the global enterprise…" (Tsupros, 2009, in Gerlach, 2012). But Gerlach cites demands for an increasingly "innovative workforce" as the reason that STEM has grown so popular in education policy circles. Gerlach expresses concern, however, for the traditional "silo approach" to discussions about STEM indicating that a more integrated and interdisciplinary approach would be more effective in creating the next generation of innovators. While acknowledging that STEM is often defined very differently depending upon whether you are a K-12 teacher, scientist, employer or policymaker, he believes they all have one thing in common: "It is about moving forward, solving problems, learning, and pushing innovation to the next level" (Gerlach, 2012).

In attempting to implement STEM into the curriculum of the K-12 system, Lantz says the curriculum actually "misses the mark." Saying it is "more than just the grafting of 'technology' and 'engineering' layers onto standard science and mathematics curricula," (Lantz, Jr., 2009, p.2). Lantz makes the argument that for progress to be made in STEM education, the traditional K-12 STEM curriculum has to be more than adding subjects like technology and engineering. He recommends a trans-disciplinary curriculum in order for true progress in STEM education. Lantz goes on to describe a variety of different approaches to curriculum design but indicates that none of them fit his definition of a trans-disciplinary curriculum.

Lantz acknowledges that there is no consensus on what function STEM education is supposed to play, but shares Morrison's list of potential functions, including

- Problem-solvers
- Innovators
- Inventors
- Self-reliant
- Logical Thinkers
- Technologically Literate (Morrison, August 2006)

The meanings of the terms above overlap with the intentions of Daniel Pink (2006) who indicated that three main principles were important building blocks for doing business in the 21st Century: autonomy, mastery, and purpose. Maeda reaffirms an important counterbalance to the convergent thinking that is the emphasis of STEM on logical thinking by suggesting that training in the arts promotes more divergent thinking (Lamont, 2010). The details of this are expanded upon later in this chapter.

Upon further review of Morrison's discussion of attributes (August 2006), she emphasizes that STEM should be taught from the point of framing the science question rather than simply reconfirming science pointing out, "The synthesis of these ideas leads to acknowledging teaching as STEM in the first place but, with design leading the way" (p.3). She goes on to say that the problem solving inherent in fields such as engineering is inherent in the arts. Furthermore, she cites Hetland (2000), Seeley (1994), and Willet (1992) indicating that "design can significantly advance academic, creative abilities and cognitive function" (Morrison, August 2006, p. 4). She is concerned about the misbelief that students in STEM education will be limited to technical careers due to a lack of exposure to the liberal arts. In the end, Morrison's attempt to define STEM is noteworthy for its emphasis on the broader picture, the "creation of a discipline based on the integration of other disciplinary knowledge into a new 'whole.' This interdisciplinary

bridging among discrete disciplines is now treated as an entity, known as STEM" (Morrison, August 2006, p. 4).

In another report that focused on STEM education at the K-12 level in Southwestern Pennsylvania, the authors described a number of barriers to comprehensive STEM curriculum including a lack of understanding by teachers on how to share information about the rigors of preparing for careers in STEM fields (Tsupros, Kohler & Hallinen, 2008). This is similar to Lantz' assertion that most curriculum was off target (Lantz, Jr., 2009). More importantly, they cited the STEM Education Caucus Steering Committee's assertion that "STEM education is responsible for providing our country with three kinds of intellectual capital," including:

- Scientists and engineers who will continue the research and development that is central to the economic growth of our country;
- Technologically proficient workers who are capable of dealing with the demands of a science-based, high technology workforce; and
- Scientifically literate voters and citizens who make intelligent decisions about public policy and who understand the world around them.
  (STEM Education Caucus, 2013)

STEM and Community Colleges

Community colleges are the focus of another report by the NGA Center for Best Practices (Baber, 2011). It is precisely because of the affordable and flexible nature of community colleges, says the report, that this governor-led organization recommends that community colleges use their influence to develop STEM education and workforce. These include a variety of incentives that provide rewards for completion of STEM courses, supporting math remediation, and examine the transferability of STEM credits or credentials. The report cites the low degree and credential completion rates as one of several barriers to community colleges' increasing STEM skills in the workforce. They also indicate that math remediation may be ineffective. In addition, the report indicates

that there is a skills gap or mismatch that does not address growing demands in certain STEM fields.

On the other hand, the NGA report indicates that there are assets that community colleges bring that could increase STEM skills, including strengthening the alignment of curriculum to local/regional industry workforce needs. The flexibility of community colleges was cited as key in an example in Kentucky where Toyota worked with the Kentucky Community & Technical College System to develop curriculum that better prepared workers for the demands of that employer (Baber, 2011).

In spite of this, the NGA report indicates that "new models of STEM-skill development will be needed" (Baber, 2011). A variety of curriculum and funding models were examined but many of which depended upon federal funding that is no longer available.

At a STEM-focused educational summit, the sessions centered on community colleges and the challenges of improving STEM graduation rates. A summary of the summit titled, Community Colleges in the Evolving STEM Education Landscape: Summary of a Summit (2012), highlights some of the sessions. Eric Bettinger's "The Loss of Students from STEM Majors," describes a study based around the persistence rate for Ohio's STEM students. At the community college level, Bettinger indicates that, "only 14% of the students at two-year colleges who intended to major in STEM fields when they took the ACT exam were still in a STEM field at the time of their last enrollment" (p.20). Among several reasons he believes this occurs is that "the culture of STEM fields is off-putting once higher education is reached" (p. 21). A follow-up discussion described in this same report mentions culture again, but in terms of gender. In a discussion at the summit, Catherine Didion, from the National Academy of Engineering, indicated that women students and students from other underrepresented

groups may not see how the STEM fields can give back to their communities. Whereas Martha Kanter (secretary, U.S. Dept. of Education) suggested that mentors and advisors would be critical for students to stay on track and avoid taking unnecessary courses and "avoid getting lost in the system" (p.21).

The last point regarding mentoring was the topic of another summit speaker's presentation, Becky Packard, Mount Holyoke, who talked about "Outreach, Recruitment, and Mentoring." She suggested that mentoring and role modeling would benefit students more if extended to industry partnerships or colleagues within the industry. She also said that students need accurate information about their career options.

TAKING A LOOK AT STEAM AND THE ARTS

The use of the term STEAM, in contrast to STEM, is meant to invoke the addition of the arts to the core fields of science, technology, engineering and math. The term, made popular by John Maeda, graphic artist and scientist, formerly of the MIT Media Lab and former president of the Rhode Island School of Design, STEAM is both a concept and a movement to integrate art and design into the STEM fields in order to help foster greater innovation and make an impact on the United States economy when many industries and occupations have moved off-shore (STEM to STEAM, 2013). In an interview with *The Observer*, Maeda states:

> Art helps you see things in a less constrained space. Our economy is built upon convergent thinkers, people that execute things, get them done. But artists and designers are divergent thinkers: they expand the horizon of possibilities. Superior innovation comes from bringing divergents (the artists and designers) and convergents (science and engineering) together. (Lamont, 2010)

STEAM has been described as a strategy for business, according to blogs published by *Huffington Post* and *Fast Company* (Wilson, 2013; Fast Company Staff, 2011). Companies often cited as bridging art/design and STEM fields include Google, Apple, OXO, Kohler, Target and Herman Miller with many small businesses following suit, leveraging technology and the arts in order to compete in today's marketplace (Wilson, 2013; Fast Company Staff, 2011). In addition, a recent report by Americans for the Arts took a direct look at the impact of the arts on the economy concluding that communities gain jobs, government revenue, and build tourism when they invest in arts industries (Americans for the Arts, 2012, June).

Gaining Proficiency by Adding Arts to STEM

The Federal government recently launched a public-private initiative titled "Turnaround: Arts: Creating Success in Schools" to address the increasing problem of cuts to art education programs, especially in high poverty areas. Specific elementary and middle schools were invited to apply for specialized grants and support. The grants are based on research that suggests that "...(W)hen students participate in the arts they are four times more likely to be recognized for academic achievement, have higher GPA/SAT scores, and demonstrate a 56% improvement in spatial-temporal IQ scores." Higher levels of math proficiency, increased engagement, cooperation, and self-confidence are also mentioned as reasons for the program (*TAI: Turnaround Arts Initiative Overview;* n.d.). In addition, a policy-level approach has been introduced into Congress in a bill indicating the value of art and design in the study of STEM fields. The bill suggests that including art and design in STEM programs could actually impact economic growth. The bill states that art and design be included in STEM programs with the reauthorization of the Elementary and Secondary School Education Act and the

Higher Education Act as a means of moving from STEM to STEAM (*Bill Text 113th Congress (2013-2014) THOMAS (Library of Congress),* 2013).

In a white paper published by the California Alliance for Arts Education (Landon, J., & Powell Russell, D. L., 2010), the link between preparation in the California visual and performing arts education standards (VAPA) and career and technical education programs shows that five out of 15 CTE standards include VAPA standards (p. 11). The report indicates "as part of the CTE [Career Technical Education] Foundation Standards, these arts standards are not merely related to CTE, they actually help form the basis of student learning across all career pathways within each industry sector" (Landon & Powell Russell, p. 11). The authors argue that funding debates for arts education cannot be pitted against career technical education because of the overlapping relationships that have been established. Gardner is cited in the CAAE white paper for his theory of multiple intelligences, whereby Gardner insists "that creativity can involve the fashioning of products or the devising of new questions as well as the solution of problems," inferring that the emphasis on "a new kind of product" surpasses products created through artificial intelligence alone (Gardner, 1993, p. 35).

While the California report focuses on high school CTE pathways, community colleges have traditionally promoted strong linkages with secondary school partners through their CTE programs. This is especially important in regards to federal funding initiatives such as the Carl D. Perkins Act. One of the four core principles of the recently renewed act encourages "strong collaborations among secondary and postsecondary institutions, employers, and industry partners to improve the quality of CTE programs" (United States Department of Education Office of Vocational and Adult Education, 2012, April).

The CTE Sectors and Pathways identified in the California study that have these VAPA (Visual and Performing Arts) cross-overs, Landon and Powell Russell present the connections as follows:

1. **Arts, Media and Entertainment:** a) Media and Design Arts; b) Performing Arts; c) Production and Managerial Arts; [VAPA: Dance (2 criteria), Music, Theatre (2 criteria), Visual Arts (2 criteria)]

2. **Building Trades and Construction:** a) Cabinetmaking and Wood Products; b) Engineering and Heavy Construction; c) Mechanical Construction; d) Residential and Commercial Construction; [VAPA: Visual Arts (7 criteria)]

3. **Engineering and Design:** a) Architectural and Structural Engineering; b) Computer Hardware, Electrical, and Networking Engineering; c) Engineering Design; d) Engineering Technology; e) Environmental and Natural Science Engineering; [VAPA: Visual Arts (14 criteria)]

4. **Fashion and Interior Design:** a) Fashion Design, Manufacturing, and Merchandising; b) Interior Design, Furnishings, and Maintenance; [VAPA: Visual Arts (17 criteria)]

5. **Manufacturing and Product Development:** a) Graphic Arts Technology; b) Integrated Graphics Technology; c) Machine Forming Technology; d) Welding Technology. [VAPA: Visual Arts (2 criteria)] (Landon & Powell Russell, p. 12)

This relationship between technical and creative fields is consistent with Pink's assertion that the current Conceptual Age – as opposed to the previous Industrial Age – requires more arts and right-brain thinking in order to create innovative organizations and individuals needed for future economic growth (Pink, 2006). He describes six abilities that matter most in organizations and individuals today:

1. **Design** – Pink calls this a fundamental business literacy and cites examples such as GM's former design leader Bob Lutz who said that "we are in the arts and entertainment business," rather than pure transportation. Creative thinking skills are harder to outsource or automate, two key points he says are important to future economic success.

2. **Story** – Narrative is now an important tool to differentiate products and services. In the age of the Internet, story now serves as a knowledge management differentiator, bringing value to relationships.

3. **Symphony** – Symphony is the opposite of focus, encouraging the ability to see the big picture. Called the "killer app," Pink suggests we could learn symphony by learning to draw, and therefore "see." Artists practice symphony by their ability to see the overall picture and the smaller details, recognizing visual proportions, relationships, light and shadow, negative space (space between space). Solutions, Pink says, are often on the periphery, and not at the center of our focus.

4. **Empathy** – Empathy serves as a good balance to logic, especially in fields such as medical professions, and ones requiring human interaction.

5. **Play** – Pink suggests that there is great benefit to the spirit of playfulness and games, creating a more receptive environment for innovation.

6. **Meaning** – According to Pink, meaning has moved to the center of every successful career. Far beyond extrinsic motivators, people perform better when they feel they are part of something bigger than themselves. The arts, according to Pink (2006) and other authors (Catterall, 2009) are an important way of discovering ways of creating meaning.

It is the combination of these six, and their relationship to exposure in the arts that Pink suggests will create a workforce that is both innovative and difficult to outsource.

Pink's six senses listed above were also cross-referenced with the VAPA strands, *Studio Thinking's* "habit of mind" (Hetland, Winner, Veenema, & Sheridan, 2013), Eisner's "ten lessons that arts teach," and a series of attributes identified as important 21st Century "learning and innovation skills" to demonstrate the "gifts of the arts" in a report addressing the value of a comprehensive arts education for marginalized youth (CCSESA Arts Initiative, 2010, February 1). All of these theories are connected in one form or another with the 21st Century workforce skills which include: thinking creatively, working creatively and collaboratively with others, systems thinking, communication, project and time management, use and evaluate information, and technology applications (CCSESA Arts Initiative, 2010, February 1).

Eisner goes into great deal from a theoretical perspective culminating in a total of 13 major ideas on the relationship of the arts to cognitive development (2002). Five of the ideas that apply to this discussion are included here:

1. “Humans are meaning-making creatures” – Creating meaning goes beyond words, and includes the many different sensory forms addressed by through the spectrum of visual and performing arts. These involve the ability to make meaning in the arts, the same way we read meaning into other academic disciplines (p. 230).

2. “Judgments about qualitative relationships depend upon somatic knowledge or ’rightness of fit’” – Adjusting these qualitative relationships involves cultivating the aesthetic, a “life pervaded by feeling” (p. 231). He reminds us that the opposite word “anesthetic” involves having our feelings dulled (p. 231).

3. “Aesthetic qualities are not restricted to the arts; their presence depends upon how we choose to experience the world” – All forms of experience, physical and otherwise, can be had through an aesthetic lens, and the arts teach us to “frame” our experience in aesthetic terms (p. 231).

4. “Artistic activity is a form of inquiry that depends on qualitative forms of intelligence” – It involves process, working within constraints, a process of “compression" as well as expression, and “the ability to make effective judgments” (p. 232).

5. “The process of representation stabilizes ideas and images, makes the editing process possible, provides the means for sharing meaning, and creates the occasions for discovery” (p. 239) – This involves transformation, modification, and representation in the process of creating. “Exploratory manipulation of those happy accidents [are] a form of experimentation” that promotes growth (p. 240).

Creativity and Innovations as Business & Education Priorities

A recent survey by Hart Research Associates (2013, April 10) indicates that employers have made innovation a priority in hiring (95%). As a result, they seek a higher level of emphasis for a learning outcome on innovation and creativity (71%) than is currently being taught. This was followed by teamwork and collaboration (67%), “connect choices and actions to ethical decisions” (67%), and “knowledge about science and technology” (56%). In addition, the report indicated employers want more “critical

thinking and analytical reasoning skills" (82%), and various analytical and communication skills.

Robinson, in his book *Out of Our Mind: Learning to be Creative* (2011), provides an explanation of the differences between the terms often applied to the arts: imagination, creativity, and innovation. Imagination, he says, "is the ability to bring to mind things that are not present to our senses" (Robinson, p. 141). We can have "imaginary experiences" and thoughts which allow us to "step out of the here and now" and put ourselves into "the minds of others" (p. 141). On the other hand, creativity, he suggests goes further than imagination because it involves some kind of action. Robinson says that it involves being creative in your work, such as math, engineering, business, or other fields. Creativity is, in essence, the results of imagination having been applied to a given situation. Innovation goes yet a step further, with the "general intention of being beneficial" when introducing something new. Innovation, therefore, becomes the application of creative thinking.

In a comprehensive review of studies on the impact of the arts republished by the National Endowment for the Arts, *the Harvard Project Zero: Reviewing Education and the Arts Project* [REAP] (Winner, 2001) culled through reports of studies from 1950-1999 narrowing the 11,467 results to 188 reports and 275 effect sizes. The purpose of the REAP study was to make recommendations on policy. The authors were able to narrow down the results of the 188 reports to three areas where arts education positively impacts success in non-arts areas. These included 1) listening to music and spatial-temporal reasoning; 2) learning to play music and spatial reasoning; and 3) classroom drama and verbal skills. The reports lacked the ability to be generalizable to wider application, even when results indicated there were small to medium relationships found in those studies between the arts areas and the non-arts application.

Winner and her team indicated that policy implications needed to be addressed from the direction of how the arts were justified (2001). Unique to American education, she says that “the arts are the only school subjects that have been challenged to demonstrate transfer [to other academic disciplines] as a justification for their usefulness.” Acknowledging that “the arts offer a way of thinking unavailable to other disciplines,” the author suggests instead that we look to history as a way of addressing the value of arts in education, saying “cultures are judged on the basis of their arts; and most cultures and most historical eras have not doubted the importance of studying the arts" and that “studying the arts should not have to be justified in terms of anything else.” Two suggestions for further theory-driven research were offered: 1) perform ethnographic studies of schools that make arts a prominent role in their curriculum; and 2) examine the arts as “motivational entry points for non academic students.” In this proposed latter study, the authors indicate that the arts may be a vehicle for keeping at-risk students in school (Winner, 2001), a direction that is in keeping with the mission of community colleges to improve higher education accessibility for underserved populations.

A paper prepared for the Heinz Endowments follows through on the relationship of culture, history, identity and the arts by reviewing over 2800 sources on what they referred to as “culturally responsive pedagogy” (Hanley & Noblit, 2009). Reducing it to 146 studies for their final report, they defined culture as “ways of being, doing and sense making” and were building “on research that had uncovered the flaw in assimilation logic” for students of color (p. 5). Taking the position that culturally responsive pedagogy leads to higher levels of achievement and resilience, the authors examined pairs of the key concepts such as culturally responsive pedagogy and achievement, or racial/socialization/identity and achievement. Although they closely examined a larger

number of studies, only 8 addressed these concepts as they specifically related to the arts. Among their primary conclusions was that “the arts must be central to any curriculum that intends to be culturally responsive” (p. 59). Citing Csikszentmihalyi and Schiefele (1992), they indicate that intrinsic motivation “is at the core of the creative problem-solving process” (Hanley & Noblit, 2009, p. 66). The authors go on to cite numerous examples of programs where the arts successfully engaged students from a variety of backgrounds, but especially those of color and from low SES conditions, and which had a positive impact on their academic success (p. 66-71). They indicated that “When students are actively engaged in creative thinking, they focus in ways that call for flexibility in thought and an integration of emotionality, rationality and meaning that is necessary for success in academic settings and elsewhere” (p. 66).

Arts & Academic Achievement in K-12

Among the more comprehensive research found, Catterall reports on his 12-year longitudinal study on the impact of the arts on “academic success and pro-social outcomes as dependent variables... signaling that preparation for a future workforce is not the only valuable aim of education” (March 2009). The source of data for his study was the National Educational Longitudinal Survey, 1988. This research followed up on a 1999 study of 12,000 18-year-olds through age 26 finding “significant advantages for arts-engaged low-SES students” among other positive relationships. These concluded that low-income and English Language Learners were more successful in “arts-rich vs. arts-poor schools,” and that low SES students who were “arts-engaged” had demonstrated advantages in “college going, college grades and types of employment” (March 2009).

In addition, Catterall's study looked at students who attended arts-rich schools but "who themselves did not participate much in the arts" referring to a positive "spill-over" or "halo effect" created from the school's arts-rich culture (Catterall, p. ii, p. 116, September 2009). Examining this in more detail, the author asked "do relatively low-arts-engaged students do better in arts-rich schools than in arts-poor schools?" (p. 118). Their results indicated "the students attending arts-rich high schools get further along in postsecondary education, get better grades, and feel more positively that their college experiences impact their jobs, terms of employment, and their future job prospects" (p. 122).

Similar to Catterall's NELS: 88 study, a report from the National Endowment for the Arts highlighted three longitudinal studies from the US Department of Education, including the NELS:88, and one from the US Department of Labor (Catterall, Dumais, Hampden-Thompson, 2012). Key findings showed that "high school students who earned few or no arts credits were five times more likely *not* to have graduated than students who earned many arts credits" (Catterall, et al., 2012) (emphasis mine). In addition, low SES youth with high arts experiences in high school were three times more likely to earn a bachelor's degree (17%) than low SES students with low arts experiences (5%), (Catterall, et al., 2012).

Continuing the pattern of most studies focusing on K-12, a 2008 report on arts education in Colorado public schools surveyed approximately 25% of their schools, with researchers rating them on 12 "arts index" factors (Cirillo, DeMuro, & Young, 2008). Among the arts index factors used to rate schools, these included use of mostly arts specialists, and the majority offering on average 120 minutes per week of arts courses. Arts courses were included in high school GPAs, and the percentage of students who received exposure to visual arts and/or music education was around 94% at the

elementary level, 66% in middle school, and 47% in high school (Cirillo, et al., 2008). The study also shows that 53% of the high schools required at least some credit in the arts for graduation. Results from their study indicated that Colorado schools that had more arts education also showed "higher academic achievement and lower dropout rates" (Cirillo, et al., 2008).

"Third space" is the name of the place between the viewer and the artist as described by authors Stevenson and Deasey (2005) in their study of 10 schools across the USA who have created educational cultures that embrace the arts as fundamental to their curriculum and sense of community. Referring to the concept of "transfer — how a particular intellectual or social skill developed by participation in the arts prepares students for learning and success in another area of school or life" (p. 5), the authors indicate that in many of the schools they examined, students began to play "active and meaningful roles in their own education" (p. 5). In terms of measured outcomes, many of the schools demonstrated improvement in reading, mathematics, and writing as a result of their arts programs (p. 62-63), in one case by as much as 85% among African American students attending Hand Middle School in Columbia, South Carolina (p. 63). The authors contend that literacy "is advanced by a desire to understand, master, and use multiple forms of human communication to grasp matters deeply and to express personal meaning" (p. 63). This desire, they claim, in generated by the experience of creating works of art (p. 63).

The issue of "transfer" is challenged in a meta-analysis of prior studies conducted by authors of *Studio Thinking 2: The real benefits of visual arts education* (Hetland, Winner, Veenema, & Sheridan, 2013). Reminding readers that there is a difference between causality and correlation, they indicate that their meta-analysis could not support claims that the arts caused increases in test scores (p. 2-3), yet they did seem to

correlate with them. The authors challenge researchers instead to begin to define “the kinds of thinking that are developed through study of the arts” which can then be extended to a study of transfer of these patterns of thinking to other fields (p. 4). “The arts are another way of knowing the world – as important as the other disciplines to our societal health" (p. 4). The authors developed a “studio thinking” framework that identifies two main areas of the studio experience. These can be broken down into a) four studio structures — “how learning experiences are organized;” and b) eight studio habits of mind (p. 4) – which address areas of potentially more transferable cognitive abilities. Among the latter “habits of mind,” the authors include the following in a non-hierarchical manner, indicating that there is no particular order in which these occur: engage and persist, envision, express, stretch and explore, reflect, observe, understand art worlds, and develop craft (p. 6-7). In an 2007 *Boston Globe* article, republished in their second edition, the author’s claim is that the combination of these “habits of mind” are “mental habits not emphasized elsewhere” (p. 9) in other fields of study, thus making them a unique contribution of arts curriculum. By way of example, the authors describe the arts as teaching one how to “see” more accurately, especially through practice in observational drawing: “Seeing more clearly by looking past one’s preconceptions is central to a variety of professions, from medicine to law” (p. 10). Even writers, they say, require “keen observational skills” in order to perform their craft well. While causal relationships are not clear, the authors extend their argument on the value of the studio thinking, stating “Those who have learned the lessons of the arts, however — how to see new patterns, how to learn from mistakes, and how to envision solutions — are the ones likely to come up with the novel answers needed most for the future” (p. 11).

In a variation on the application of studio thinking, the term “design thinking” has been used in the popular press to describe how art-trained designers approach their

creative work. In an article emphasizing new approaches to preparing MBA students, classes emphasizing “design thinking” have been used to instill more innovative approaches to their work. As explained by Tim Brown, president of IDEO, “what is different about design thinking [as opposed to critical thinking] is it’s focused on taking that understanding you have about the world and using that as a set of insights from which to be creative” (Wallace, L., 2010, January 10). The difference in approach is explained: “Instead of presenting existing problems to analyze or solve, design-thinking classes send students to do something akin to anthropological field work to find the problems. Then they field-test solutions, refining as they go” (Wallace, 2010). The practical difference was described by an MBA graduate who said in business school “you’ve got a great idea; here’s how you build a business out of it” (Wallace, 2010). She learned from the design course a process where that great idea could be discovered.

Arts & Academic Achievement in Higher Education — A Practical Example

In what is one of the few studies on the application of arts education in a STEM field, Adler (2011) describes an experiment by Yale Medical School building on the visual arts ability to improve observational skills. The aim was to discover if experience with the arts would “improve their medical students’ ability to see reality the way it is, and thus to be able to more accurately and effectively diagnose and treat patients” (Adler, 2011, p. 213). The researchers split their students into two groups, one taking an introductory art history course, the other taking no course. “To their surprise and delight, they discovered that after studying art history, the medical students’ diagnostic skills improved significantly” (Adler, 2011, p. 213).

According to Adler, writing on the Yale experiment, “the art-trained medical students improved by 56% whereas the control group, which attended clinical tutorial

sessions without the art sessions improved by 44%" (Dolev, J. C., Friedlaender, F., Krohner, L., & Braverman, I. M., 2001, in Adler, 2011, p.218). Dolev, et al indicates that the first year of the study included three groups: clinical tutorials attended by a control group; a visual art training program by the Yale Center for British Art (YCBA) attended by an "intervention" group; and then the third group attended an anatomy lecture. In the second year the third lecture group was eliminated from the study since there was little difference between it and the control group. The YCBA program attended by the intervention group required students to learn the process of describing every detail of a painted portrait. Rather than simply saying the person in the painting looks depressed, they had to describe the details of the physical attributes of the face that provided evidence of their conclusion (Dolev, et al., 2001). Adler's contention is that "learning to see art teaches people to see both the details and the patterns among details" (2011, p. 213). Writing for the *Journal of Management Inquiry*, she continues: "rather than simply making global assessments based on what they had expected to see, the art-trained medical students more accurately saw the actual condition of the patients" (Adler, 2011, p.213). Based on the results of a 25% improvement in diagnostic skills over those students who did not receive any art training, Yale has made the course on visual arts required of all medical students.

A similar study was published by Harvard researchers in 2008 showing significant improvements in diagnostic abilities by students who had taken a visual arts course versus those who did not (Kowalcyk, 2008, July 20). In a *Boston Globe* article about the visual literacy course at Harvard, Dr. Joel Katz reported that students' diagnostic accuracy improved by 36% over those who did not take the art class. In the article about this research, Katz, a medical internist and former graphic designer, said, "We're trying to train students to not make assumptions about what they're going to see,

but to do deep looking. Our hope is that they will be able to do this when they look at patients" (Kowalcyk, 2008, July 20). The study's authors indicated that teaching visual literacy through "systematic fine art observation exercises with lectures linking artistic concepts to physical examination skills" had a direct impact on improving the level of sophistication in student responses and the frequency of observations that could therefore improve diagnostic abilities (Naghshineh, Hafler, Miller, Blanco, Lipsitz, Dubroff, & Khoshbin, 2008, p. 996). For community college students focusing on transfer or occupational programs, learning a deeper mode of *seeing* —as demonstrated by the Yale and Harvard studies — can prepare students with adaptable skills required in a 21st century economy.

CONCLUSION

While extensive research exists that indicates a correlation between studies in the visual and performing arts and student achievement in K-12, very few studies have been undertaken that extend this research to higher education in general, and community colleges specifically. However, the literature does indicate that key components of student engagement, deep thinking, creative and critical thinking have strong connections to arts training and outcomes. STEM programs traditionally focus on technology and hard sciences, while STEAM adds the arts to the mix, providing a divergent thinking approach that could augment the effectiveness of the STEM fields and add to their value in building a stronger, more adaptable economic workforce. However, challenges of student engagement persist, and the literature indicates that the arts may also offer a means to improve student retention and, potentially, graduation rates. The research that follows will examine this connection in more detail.

CHAPTER 3: METHODOLOGY

INTRODUCTION

The primary objective for this research is to describe the perceptions of former community college students regarding the impact of their art course experiences on achieved success in their non-arts related careers. In exploring the issue of perception, our main research question asks: *How important is creativity, which has been inspired by a practice-based arts experience, to students' success in their educational experience and career development as perceived by STEM or non-Art-majors and graduates?* Expanding upon this, the next research question asks: *Do graduates from STEM or non-arts fields at a community college, who have taken one or more practice-based art or music course, believe that their prior college-level visual or performing arts experience gives them an edge over their non-art colleagues?*

The methodology being applied here is a variation of the qualitative research methods of Portraiture, first described by Sara Lawrence-Lightfoot and Jessica Hoffmann Davis (1997). Portraiture borrows from both the artistic approach from which it derives its name, and from phenomenological and ethnographic qualitative research methods (p.4). The process to be utilized here will include interviews of the selected subjects, aka actors — a term used in Portraiture — in order to examine how any previous experiences in these practice-based visual and performing arts have impacted their success in their chosen field. Following the practices used in the Portraiture

qualitative design method, interviews and observations are made within physical (internal), personal, and historical contexts (p. 60-73).

In this study, the research focuses on the perceptions of the interview subjects, their personal narratives as they have shared in one or more meetings, and how they believe their experiences have shaped the trajectory and personal satisfaction with their careers. Per the ethnographic work done by cultural researchers such as Clifford Geertz (1973), the object is to share their perceptions on any positive or negative impact in their academic, socio-economic, and occupational arenas. Lawrence-Lightfoot and Hoffman (1997) call this "voice as interpretation," one of several aspects of voice that helps define the Portraiture method (p. 110).

This research could lead to potential considerations regarding the role of practice-based arts in general education, especially if it meant improved success levels among students who were not college-ready when they began their academic careers. Based upon the literature and previous research as described in Chapters 1 and 2, the arts offer an educational model which engages different modes of thinking that complements those from the sciences, mathematics, practicing arts and humanities with compelling implications.

Since students have more flexibility in choosing their general core curriculum courses, the element of perception becomes an important factor for this research. As McClenney and others have said "students do not do optional" (McClenney, 2009). According to Lawrence-Lightfoot and Hoffman (1997), the Portraiture research method has the potential "to capture the richness, complexity, and dimensionality of human experience in social and cultural context, conveying the perspectives of the people who are negotiating those experiences" (p. 3). According to Bloom & Erlandson (2003), Portraiture "is a communication in process in which the portraitist seeks constantly to

understand the construction of reality that reflects the subject's past experience, gives meaning to her present experience, and directs her future experience" (p. 875). It is these three aspects of the influence of their arts experience over time that I hoped to capture through the interview process.

The importance of narratives is discussed in the medical field by Lapum, Ruttonsha, Church, Yau, and David (2011) in a transitional artistic project that was inspired by a prior narrative research study Lapum completed in 2008. In that earlier study, Lapum described having developed narrative stories of patients in the days following open-heart surgery where she used narratives as a means of data collection and analysis (Lapum, et al., 2011, p.102). Their rationale for re-addressing the narratives from an artistic perspective was to try and counter the "evidence-based routines and technological competencies" of surgeon practitioners who may avoid the humanistic needs of their patients (p. 102). Similarly, academic leaders focus heavily on evidence-based decision-making at the risk of remaining distant from the humanistic needs of students. If the community college graduates who have taken practice-based arts courses express a perceived value of their experience, it may offer an opportunity to consider a shift towards inclusion of the arts at community colleges as a core requirement. Through the narratives, students would have an opportunity to more effectively describe any kind of positive impact the arts may have had on their academic or career success.

CHAPTER ORGANIZATION

This chapter is organized starting with an overview of the Portraiture method of qualitative research. This is followed by an outline of the criterion method used to determine the research sample selection and the site from which that selection is made.

Next, a description is provided of the types of information being gathered including contextual, perceptual, demographic, and theoretical. Following that, a description of the research design is provided which includes the steps to be carried out in order to conduct this research. Data collection methods used will follow good practice in qualitative research methodology including addressing issues of confidentiality, data organization and storage, and destruction. Building upon the literature review in the previous chapter, the data collected here will expand upon the rich narrative format of Portraiture. An introduction to the data analysis and its synthesis will be included, with an introduction on how the content of the interviews will be assessed and analyzed. This last area is expanded upon more in Chapter 4, with interpretations of the data described in more detail in Chapter 5. Ethical considerations, issues of trustworthiness and limitations and delimitations are discussed at the end of this chapter.

BRIEF OVERVIEW

The study begins with a sample selection from a midwestern urban community college and is based on certain criteria. The main criteria for this group will be that subjects

- have enrolled in at least one participatory art course; and,
- completed at least 45 college credits at this community college; and
- not be a visual or performing arts major for their latest degree program (whether at the community college or elsewhere).

Other criteria are described later in this chapter. Following the determination of the initial sample group, additional variables such as gender, program code, transfer status, and home school district were used to develop a stratified random sampling of approximately 300 students. Following good qualitative practices, those in the final

sample would be sent a letter of introduction from the researcher, a description of the study, and an invitation to participate in a focus group, and/or a recorded personal interview. The objective was to conduct interviews for 6 to 10 selected candidates and record their interviews using digital audio and possibly visual or video media if the participant grants permission. Transcriptions would follow, with close analysis for patterns and themes, and the process of developing the rich narrative portraits will begin. Anonymity will be maintained using pseudonyms unless the interview subjects permit their names to be released with their stories.

ABOUT PORTRAITURE

As described by Lawrence-Lightfoot and Davis (1997), their goal was "to create a narrative that bridges the realms of science and art, merging the systematic and careful description of good ethnography with the evocative resonance of fine literature" (p. 4). Their approach builds upon the work of neurologist Oliver Sacks (1985, Lawrence-Lightfoot & Davis, 1997, p. 5) who advocated for a return to rich "clinical storytelling." According to Lawrence-Lightfoot and Davis, this is at odds with the usual process of promoting science above the person, with science resulting in "caricatures and distortions" rather than allowing patients to explain their stories in their own terms (Sacks, 1985, p. viii, in Lawrence-Lightfoot & Davis, 1997, p. 6). The authors also promote John Dewey's (1934/1958) assertion that in order to create a deeper understanding, we must also discover the "frameworks and strategies for representing the aesthetics of teaching and learning" (Lawrence-Lightfoot & Davis, 1997, p. 6).

Drawing upon both phenomenological and ethnographic research, the designers of the Portraiture method also depend upon the work of Clifford Geertz in the use of

"thick description" (1973). Geertz describes ethnography as similar to creating a painting, ascribing to the creativity and imagination of the researcher/observer. Using thick description, a balance is created through a systematic approach that is also rigorous, and maintains the humanistic aspects of the work at hand (Geertz, 1973, p. 15-16, in Lawrence-Lightfoot & Davis, 1997, p. 8).

Lawrence-Lightfoot and Davis also distinguish their Portraiture method from other approaches where there is "a general tendency of social scientists to focus their investigations on pathology and disease rather than on health and resilience" (p. 8). This scrutiny of the negative can skew interpretations, often leading to a mentality of blaming the victim and a general failure to recognize positives (p.9).

The rationale for using a variation of the Portraiture method for this research comes from a strong desire to capture an enhanced descriptive picture of the subject's experience relating their prior art educational experience to their past, present and future development. Hollway and Jefferson (2008) describe this as drawing out stories which "has the virtue of indexicality, of anchoring people's accounts to events that have actually happened" (p. 307). By capturing their stories and their perceptions of the connections, large or small, between their prior college arts experience and their life experience, we begin to see the tendrils of connection that hard quantitative data alone may not reveal.

As with the arts, we capture a portrait, but in narrative form, that provides the language, metaphors, and visual elements that will lead to a deeper understanding of the subject's experiences. Through this variation of the Portraiture method, we make detailed descriptions and observations, keeping in mind what Lawrence-Lightfoot and Hoffman (1997) describe as the internal, personal, and historical contexts of those being

interviewed (p. 61-73). The authors also reaffirm the importance of recognizing the researcher/portraitist's perspective in what they call the voice as witness and voice as interpreter of the subject's narrative. Regarding the former, Lawrence-Lightfoot and Hoffman also build heavily upon the ethnographic work of Malinowski (1938, p. 306, in Lawrence-Lightfoot and Hoffman, p. 88). Lawrence-Lightfoot and Hoffman indicate that "the portrait as witness…captures the terrain and its inhabitants with new eyes, from a position of boundary" (p. 88). Regarding voice as interpretation, they again refer to ethnographic researcher Geertz (1973) saying that "the ethnographer's work is inevitably interpretive; it is a search for meaning" (Lawrence-Lightfoot and Hoffman, p. 91). However, they distinguish Portraiture from ethnographic research saying that it also combines both thin and thick description in order to allow the reader an opportunity to see alternative potential hypothesis gained from the data at hand (p. 91).

Video can provide an invaluable resource for capturing important elements which allow the researcher-portraitist to observe what Lawrence-Lightfoot and Davis call "the ways in which the actors' movements and gestures express and communicate" (p. 99). This is what they call listening *for* voice rather than simply listening *to* voice. The Portraiture authors further indicate, "sometimes the gestures speak much louder than the words, in which case the portraitist needs to vividly describe the visible cues and the body language" (p. 99). Lawrence-Lightfoot and Davis say that it is especially important to make these kinds of observations if there is any apparent dissonance between what is said and the observed behavior (p. 100). In order to effectively describe these contexts and visual cues during the relatively brief 1-2 hour interviews, video can provide a visual note-taking process that can capture what might have been missed during the actual interview.

In addition, as Poland and Pederson indicate, capturing silence can be as valuable as the actual spoken word, indicating the limitations inherent in straight transcription in constructing meaning from the silences in a conversation (1998, p. 293). “What is not said may be as revealing as what is said,” the authors continue, saying “silences are profoundly meaningful” (1998, p. 294). Additionally, the authors indicate that “self-expression through non-discursive modalities,” as found in different art forms, “require different approaches to capturing meaning and communication that, although often silent in a verbal sense, are nonetheless pregnant with meaning” (1998, p. 303). Since it is possible that, in the course of discussing their art experiences, these former students may want to share some visual material during our conversation, video may prove more effective at capturing the nuances this is aspect more effectively. However, this researcher is prepared to use alternative methods when interview participants do not permit video.

OVERVIEW OF INFORMATION NEEDED

The information sought for this study is heavily dependent upon the gathering of the narrative portraits of these former community college students who had previously enrolled in participatory (i.e., studio or performance) visual or performing arts courses. The objective is to gather perceptual data in the form of these highly descriptive stories. As some cultural researchers have indicated, the perceptions of the interviewees will be instrumental in addressing the value of their earlier arts experiences. These efforts to record the interviews are intended to more accurately capture the interviewee's story, and therefore improve the validity of the research, Merriam indicates that “what is being

investigated are people's constructions of reality — how they understand the world" (Merriam, 2009, p. 214).

Context, such as their current and former socio-economic conditions and the interview location, could also be important to the eventual analysis of the rich narrative data gathered. Some basic demographics could be important in the initial stages, especially in regards to criterion used to distinguish who would be contacted.

RESEARCH DESIGN

Sampling Criterion

Subjects being interviewed for this study were selected from students who attended a mid-sized urban midwestern community college. This college has an enrollment of approximately 11,000 unduplicated students drawn from a small urban industrial city and the surrounding suburban and rural communities within an hour's drive. The college also has centers or extension offices in the inner city, one in a more suburban area, and another in a more rural area.

Data from college records were analyzed using several dependent variables. Criterion for the initial sampling were that students

- enrolled at this community college between 2007 and 2013;
- completed at least 45 credits at the community college;
- graduated from the same community college, or...
- transferred and graduated from a four-year institution; and
- enrolled and successfully completed one or more practice-based art course while attending the community college; and
- were not a visual or performing arts major for their most recent program of study.

In addition, as data were available, modifiers such as age, gender, and home district were considered. Mediating variables were applied for courses taken in a particular art discipline (i.e., music, visual arts, media, design) and depending upon the range of students. The objective was to define a group of approximately 100 subjects to contact for the next stage.

Step 1: Determining the Data Sample

Beginning with the data sampling provided by the college for the period from 2007-2013, an initial sampling of 1009 students was identified. The data included courses taken in particular programs (studio art/design, music, theatre, media, and photography), gender, number of credits completed at the college, age, program, degree, and transfer status when available. GPA, race, and ethnicity were not included. To further reduce the sample, students who had not taken any practice-based visual or performing arts courses were eliminated. This meant that students who had only taken primarily lecture courses such as art appreciation or introduction to theatre were eliminated. In addition, the list was further limited to students who had taken practice-based courses in studio art/design, music, and theatre. This resulted in excluding students who had only taken courses in photography or media, courses with a heavy technology emphasis. A total of 109 students were identified for potential contact. The next step was to determine the best method of initial contact. Through my teaching experience, I learned that the preferred mode of communication for students in this age group is through social media, i.e., Facebook. To further identify the student on Facebook, I searched for students who publicly indicated that they attended this community college, or were friends with someone who had. The list was further pared down to 38 candidates who could be confidently identified as being the candidate in

question. Based upon the initial sampling of 38 described here, the next steps were the following steps.

Step 2: Letter of Introduction

Using the most currently available contact information, and following good qualitative research practices, a two-pronged method was employed that included reaching out to students by both social media and regular mail to their last known address. Students were first contacted via Facebook with the letter of introduction being sent through Facebook messaging. After approximately a week, with five responses, the same letter of introduction was sent by regular mail to the remaining 33 potential interviewees *(See Appendix A)*.

The letter introduced the study and its purpose and asked them to consider participating in either a focus group or one-on-one interviews. The letter of introduction also introduced me as the researcher and provided a brief biography. A sample letter of introduction is found in Appendix A.

Step 3: Focus Group Data Collection

Based upon the scattered responses to the letter of introduction by both Facebook and regular mail, data were gathered through recorded personal interviews only, foregoing any focus groups.

Step 4: Brief Phone or Email Contact

For those who indicated an interest in participating in either focus groups or ~~a~~ one-on-one interview, a brief introduction via phone at the telephone number indicated, or by email or Facebook message, as preferred by the subject, was done addressing their current career status and interest in the research study topic. A sample script is attached in the Appendix D. In most cases, however, the dialogues were more direct

with candidates asking questions about the study, confidentiality, and to arrange a time for an interview. A total of 15 students responded to the invitation and nine said that they were interested in participating.

Those who indicated their interest in the study were invited to participate in a one-on-one interview since responses were scattered over a four-week period. Audio and video recordings were utilized during the interviews with written consent of participants. A research assistant proved to be unnecessary, but contingencies were made to ensure confidentiality should one be needed. A sample of the Letter of Invitation/Consent Form, and, although not used, a Focus Group Questions Guide are included in Appendices B and C. A Research Assistant Confidentiality Agreement is also included in Appendix G.

Step 5: Comprehensive One-on-One Interviews

Based upon the subjects' indications, deeper one-on-one interviews were conducted with a total of 7 subjects identified as being good candidates for developing narrative portraits. A neutral location was offered at a date and time agreeable to the subject. However, the participant could also suggest a location of his/her own choosing. Interviews were recorded by audio and video. Participants were invited to share any artifacts that would help improve understanding of their experiences, especially where the arts played any notable role in their current success. However, none took advantage of that offer. The purpose of recording with video — with permission granted by the interviewee — was to enable the researcher to capture the nuances, gestures, and contexts of the interview, and to use data collected from these interviews to create thick descriptive narratives that captured any emotive aspects that could be shared. While the Portraiture method can be done over longer periods of time as recommended by Lawrence-Lightfoot and Hoffman (1997), the shorter timespan of the planned interviews

in this study indicated that video would be useful in capturing the impact of the subject's art experience more clearly than a transcript alone could provide. The intention was that with enough video stories gathered, these could become part of a web-based version of the dissertation, as long as permission has been granted in writing by any participants whose video has been included. If not, this will remain a print-only dissertation.

Interviews averaged about 60-90 minutes each with follow-up questions sent as needed and agreed to by the interviewees. Four of the participants chose to be interviewed in a study room at the college library. The other three chose to be interviewed in a small office of a local art gallery. Participants were offered a neutral location or another of their own choosing, which could include their home. From an ethnographic aspect, the latter could provide a richer understanding of the subject's arts experience. However, none considered holding the interview at their home. For candidates located too far for travel, interviews were offered via online video conferencing, though none took advantage of that offer.

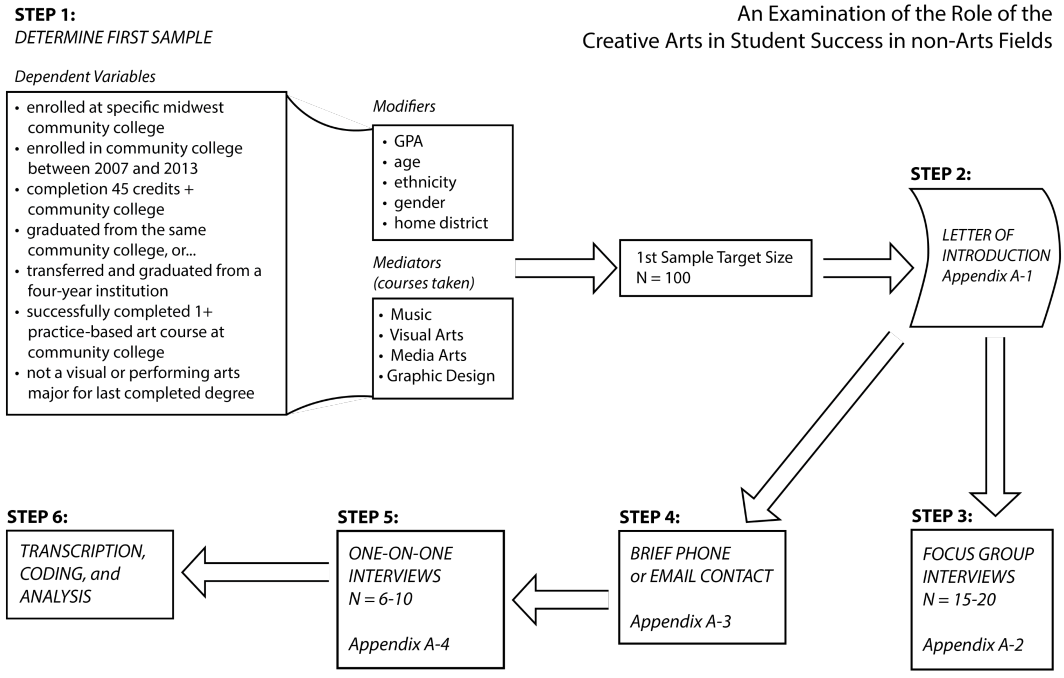
These former community college students were willing to share how their careers have been shaped following their educational and professional experiences. The interviews provided an opportunity for these former community college students to reflect upon any perceived connections they had on the impact of their prior arts experience and trajectory of their personal and professional development. In keeping with good qualitative research practices of confidentiality, the resulting data would be triangulated with student data acquired from the college, and anonymity and confidentiality maintained as preferred by the participant. The subject was also given the option of opting out of being anonymous and therefore allow their name and/or image to be attached to their story. An Individual Interview Letter and Statement of Confidentiality, along with an Interview Guide are included in the Appendices E and F. In the case of the

seven interviewed, only one chose to keep both his name and image confidential. The other six gave permission to use both their names and their video images. However, in light of the conversations, I have chosen to give them all pseudonyms.

Step 6: Transcription, Coding and Analysis

All data were coded and analyzed for themes and patterns. Interviews were transcribed and synthesized for further analysis. All seven individuals interviewed were invited to review their transcripts for further clarifications and accuracy. Their additional input would be included in the final data for further examination. However, no corrections or further clarifications were offered. All confidential data collected have been kept on password-protected digital storage devices and all confidential identifying information will be destroyed after a period of three years.

Figure 1: Research Methodology Flow-Chart



DATA COLLECTION METHODS

A selected literature review found in Chapter 2 preceded this study. While the literature review is not actual data used for this study, it does inform the direction this study has taken. Studies, such as the Catterall (2009, 2012) 12-year longitudinal research, demonstrate the strength of quantitative methods in determining how the arts may impact student success based on the exposure to the arts in K-12. As comprehensive as this study may be, it is limited by its lack of a narrative and examination of the role the arts may play at the college level in later success. It is the intent of the current study to lay the groundwork for understanding the potential value of the arts, especially for former community college students, many of whom may have had little or no exposure to the arts before college.

Another study, such as Adobe's report (2012) described in Chapter 1, and cited examples in *Fast Company*, *Huffington Post* (Wilson, 2011, Fast Company Staff, 2013) and others in Chapter 2 relating the importance of art and design to business and STEM fields, begin to address the perceptions of business and the general public regarding the role of creativity in economic growth. But as helpful as this may be in establishing a baseline of understanding on the general angst regarding a perceived lack in their own creativity, these studies fail to provide a human and relatable narrative.

Another issue with the previous studies is that they are mostly focused on arts education in the K-12 system. They have been successful in demonstrating the value of the arts in student success in a very transformative way (CCSESA Arts Initiative, 2010). Very few, if any, studies were found addressing college students, the exception being studies of medical students at major universities (Naghshineh, S., Hafler, J. P., Miller, A. R., Blanco, M. A., Lipsitz, S. R., Dubroff, R. P., & Khoshbin, S., 2008). However, none of

these prior studies begins to address the potential value of the arts for community college students who are most often the more underprepared for college success.

Previous pilot studies conducted by this researcher were tested in the form of surveys of a small sampling of current STEM students at a community college on their perceptions of the role of creativity in success in their field. Initial results indicated that these students valued creativity even more than initial technical skills. Another pilot study used available data from a graphic design program at a community college and indicated that students who had participated in a specialized experiential course open to all majors had higher graduation rates regardless of their major than students in the graphic design program who had not taken this course.

For the current research, the data collection method was primarily one-on-one interviews in order to create rich narrative portraits. Interview questions asked of these community college students have been designed to flow around how their careers have been shaped following their educational experiences in the arts and later professional experiences. Consistent with good portraiture and qualitative research methods, the interview process remained emergent and flexible, allowing the process to adapt as the conversations developed.

Using digital recording methods, the interviews were captured on video and audio. Interviewees were encouraged to share anything that would help improve my understanding of their experiences, and especially where the arts played any notable role in their current success. Issues of confidentiality played a role in what is included in the final research report.

DATA ANALYSIS AND SYNTHESIS

After the interviews were completed, the data, manifested as narrative portraits, were triangulated — or crystallized — for analysis of potential patterns and parallels across the subjects' different experiences.

The resulting report, included in Chapter 4, includes rich descriptive narratives weaving together the stories from each of the subjects interviewed and how their experiences in college courses in visual or performing arts may or may not have shaped the paths to their current careers or areas of study.

From this analysis, several clear patterns emerged that could lead to potential recommendations in future educational policy. A final analysis and interpretation of the study's findings are included in Chapter 5.

ETHICAL CONSIDERATIONS

The main ethical issue that could arise regarding this study is one of confidentiality of the participants in either the focus groups or one-on-one interviews. In all cases regarding participants, steps were taken to ensure confidentiality and anonymity by use of pseudonyms. The option to opt out of anonymous participation was also available; it was potentially feasible that a participant might prefer to have their name attached to their own narrative story. The implications of this were discussed with the participants. In addition, confidentiality of the specific college where the sample was selected for this study has been indicated as a requirement for use of their source data. Beyond the issues of confidentiality, there is minimal risk to participants involved in this study.

ISSUES OF TRUSTWORTHINESS

The trustworthiness of this variation on the qualitative research method of Portraiture is addressed through the following methods. A clear statement of the researcher's biases through reflexivity, whereas the experiences, biases, and predispositions of this researcher are reflectively described, establishes a baseline for the credibility of this study. Described in more detail in Chapter 5, this researcher has considerable experience in the arts, with three prior academic degrees obtained that have a primary focus in some aspect of the visual arts. In addition, this researcher has an established background in the performing arts both in music and theatre. As a full-time faculty in the visual arts for the last 17 years, this researcher has experience observing and assessing students in the context of studio-based visual arts. While the values of this researcher do not eliminate variance, by disclosing their existence the reader may understand how the researcher's prior experiences may influence the conclusions of this study.

Other aspects of trustworthiness are addressed including internal validity which will employ triangulation and crystallization of the data gathered during the interviews. This will occur through observations made by the portraitist researcher, with an examination of the reality as measured by the perceptions of the interviewees and the rigor through which attention has been paid to each detail in the analytical stages. Triangulation may be initiated by crosschecking stories shared by the different interviewees, as recommended by Merriam (2009, p. 216). Crystallization is an alternative approach that may be utilized where multiple data sources are examined in relationship to each other (p. 216).

As Merriam (2009) indicates, "validity and reliability are concerns that can be approached through careful attention to a study's conceptualization and the way in which

the data has been collected, analyzed, and interpreted, and the way in which the findings are presented" (p. 210). Reliability of the data for this portraiture research method will not be achieved in the traditional sense. However, it may be indicated in the form of dependability as achieved through saturation, whereupon stories shared by interviewees begin to develop plausibility through consistency within their stories. Merriam (2009) indicates that "because human beings are the primary instrument of data collection and analysis…interpretations of reality are accessed directly through their observations and interviews" putting us "closer to reality" than other forms of data collection (p. 214). Furthermore, "when rigor is viewed in this manner, internal validity is a definite strength of qualitative research" (p. 214).

Where the subjects interviewed were selected from a range of variables, including geographic origination, age, and gender, transferability may also be addressed. The setting from which the interview candidates are selected is a midwestern community college that serves a wide variety of constituents, a fairly typical range in ages, with an average age of 29 years old, a balanced mix of gender, and races, and arriving at the college from urban, suburban, and rural areas within the college district.

LIMITATIONS AND DELIMITATIONS

Potential limitations incurred from the qualitative methodology began by the identification of potential candidates for interviews, including arranging a schedule and location that was agreeable to the interviewee, and potential challenges with electronic recording equipment. Candidates may also have been predisposed to participate in this study due to a variety of reasons. In addition, the Portraiture method brings limitations vis-à-vis the descriptions of metaphors as defined by the portraiture researcher, thereby

putting the “portraitist’s voice... everywhere” (Lawrence-Lightfoot & Davis, 1997). Other limitations included the accessibility of the participants being interviewed, determining recent contact information, and the extent to which they were interested in sharing their stories. The delimitations involved maintaining careful control over the researcher’s voice so as not to overpower the subject being interviewed. In addition, other delimitations were set through the selection of the candidates interviewed, especially that they all were non-art majors for their last area of study, and attended at least one practice-based visual or performing arts course at the same midwestern community college.

CONCLUSION

In conclusion, the choice of the use of the qualitative research approach of Portraiture has allowed this study to develop partially as an ethnographic and rich narrative study in order to examine the impact of the arts on student success. In determining the sampling, which came from a midwestern urban-based community college, the goal was to find a range of former students who could shed light on the value of their prior college arts experiences on their later career development. This research builds on prior studies that took a more quantitative approach, focusing mainly on the K-12 sector with only limited research for college students, mostly in the medical sciences.

CHAPTER 4: FINDINGS AND RESULTS

INTRODUCTION

In this chapter, the results and outcomes of the study conducted on the role of creative arts for non-arts fields are discussed based upon the data that was collected from a series of interviews. The research approach intended for use was qualitative using a variation of the Portraiture method, as described by Lawrence-Lightfoot and Hoffman (1997), and which is "framed by the traditions and values of the phenomenological paradigm" (p. 13). Due to the shorter timespans spent with each of the participants, ranging from about 60 to 90 minutes each, video and audio recordings were made to ensure accuracy and also capture non-verbal cues that could assist in understanding the meanings intended by the interview subject. In keeping with the Portraiture method, however, a dialogue ensued between the researcher and subject, which led to a richer description "conveying the perspectives of the people who are negotiating those [human] experiences" (p. 3). The interviews revealed three overarching themes shared by the participants as they described their paths through their studies and beginning careers. An overview of the data collected is described and then followed by a more in-depth presentation of the data for each of the three main thematic categories and the eight sub-themes that emerged. Although not strictly applied, in reviewing the interview transcripts several times, a loose application of the newer version of Bloom's Taxonomy (R.C. Overbaugh & L. Schultz, n.d.) was useful in determining key words or phrases. These words were highlighted in different colors in

the printed transcript depending on their subject being expressed, or storyline. Using a spreadsheet program, a grid was developed to record these key words and phrases, organized by similar meanings, and thus determine potential patterns *(See Table 3 for Summary of Themes).* The themes that resulted were the following:

- **Structural**
  - Understanding Complex Systems
  - Bridging Interests
- **Emotional**
  - Patience & Persistence
  - Collaboration & Teamwork
  - Personal & Professional Communications
- **Transitional**
  - Disillusionment
  - Inspiration
  - Transformation

Original Research Questions

The original research question that formed the basis for this study asked: *How important is creativity, which has been inspired by a practice-based arts experience, to students' success in their educational experience and career development as perceived by STEM or non-arts-majors and graduates?* A related secondary research question asked: *Do graduates from STEM or non-arts fields at a community college who have taken one or more practice-based visual or performing arts courses, believe that their prior arts experience gives them an edge on their non-art colleagues?* In the case of the first research question, the results indicated that most of the interviewees considered

creativity, or some creative activity, to be important in their success or satisfaction in their work or daily life. As for the second research question, there was less of a definitive response. Many of the participants felt they had not yet reached a point in their careers — or even begun their new careers based on their non-arts majors — where they could make that judgment. In two cases, students who had completed art degrees mentioned, with a tone of good-natured sarcasm, that their arts training may have caused them to take much longer on assignments in the courses for their non-arts major that they pursued later compared to their classmates with little to no arts background.

Contacting Potential Participants

Facebook became the primary medium of contact for 38 students who were invited to participate from a midwestern urban community college, having been selected based on the criteria described earlier in Chapter Three. In addition, most of these students were sent a written letter by traditional mail to their last known address. Fifteen students responded to the invitation, with nine indicating they would be interested in participating, and a final total of seven respondents scheduling an interview. Once contact was established, respondents were split between Facebook and email communication in their preference for communications before and after the interviews. These contacts mostly addressed basic questions from the participants related to scheduling, questions on confidentiality, and then after the interview when the researcher requested that they review the interview transcript and their confidentiality agreement.

PARTICIPANT DEMOGRAPHICS

The seven participants who were interviewed represented a mix of different races, ages, non-arts majors, and levels of and subject area exposure to the arts.

However, all seven were either currently pursuing, or had completed as their last major, a STEM or other non-arts major, either from the community college, or after transfer to a four-year institution.

The participants were made up of three females and four males, ranging in age from 25 to 39 years old. All seven had completed at least one associate degree at their community college. The subjects mostly identified themselves as white, with two African American students, and one participant who identified himself as "mixed Anglo-Asian." Four participants came from what are known as mostly suburban areas. Two others came from urban areas, and one identified herself as coming from a mostly rural region. *(See Table 1. Basic Demographics.)*

TABLE 1. Basic Demographics

	Name/ID	Gender	Age	Race	School District
1	**Ray**	M	25	White	Suburban
2	**Traci**	F	30	White	Suburban
3	**Ralph**	M	39	Black	Urban
4	**James**	M	36	Black	Urban
5	**Brea**	F	31	White	Rural
6	**Hannah**	F	34	White	Suburban
7	**Zeke**	M	25	Mixed Anglo-Asian	Suburban

Note: Age, Race, and School District were self-identified at time of interview. All names are pseudonyms.

The educational backgrounds for all seven participants also varied. Although all seven participants had earned an associate degree, two of them had received two associate degrees, and one student had also completed a bachelor's degree, which was in a STEM field. Two more participants were enrolled in a bachelor's degree program

with one of them indicating that he was “taking a break” from his studies. Among the seven participants, three completed associate degrees in a visual arts field but had since switched their interests to STEM areas. In addition, one participant had made major progress towards a theatre degree before completing his associate degree in criminal justice. Another participant had begun an associate degree in music before switching to and completing his associate degree in electronics. One participant recently completed an associate degree in business management, while another participant who completed two simultaneous associate degrees, an AA and AS, said he set his final focus on computer science. The majority of students (about five out of seven) stated their intentions, in one form or another, to continue their studies towards another credential, while all of them expressed a desire to combine their interests in the arts with their non-arts training *(See Table 2. Education & Career Data).*

Table 2. Education & Career Data

	Name	Completed College Degrees	Current Student	Educational Plan	Current Employment	Career Plan	Art Courses at Community College
1	**Ray**	AAS in Electronics	N	none	Electronics Technician in auto industry	Electronics Technician and Musician /Composer; Interest in Music Technology	Music Theory, guitar class, Vocal course.
2	**Traci**	AAS in Graphic Design	Y	AAS in Nursing	Freelance Comics, occasional retail.	Nursing. Interest in medical communications or illustration.	Foundation Art Studios, upper level studios in Graphic Design & Illustration
3	**Ralph**	AAS in Criminal Justice	Y	Bachelor's in Criminal Justice or Bachelor's in Theatre. Currently "taking a break"	Assembly Line for auto industry	Full-time actor	Theatre, Acting
4	**James**	AA and AS (no major)	Y	BS in Information Technology minor computer science	Computer Technician in auto industry	Interest in owning his own computer repair business.	Piano class. Describes also having taken drawing and theatre courses.
5	**Brea**	AAS in Business Management	N	Bachelor's, possibly combining arts and management	Waitress	Own her own Internet business selling up-cycled fashion products	Basic Drawing I and II, Basic 2D Design
6	**Hannah**	AAS in Graphic Design BS in Information Technology	N	Nothing specific	None stay-at-home mom Previously worked for tech industry as designer/data entry	Interest in working in Forensics in IT	Foundation Art Studios, upper level studios in Graphic Design
7	**Zeke**	AAS in Graphic Design AS in Science	Y	BS in Chemistry	Library Communications and personal small vinyl business	Chemist, educator. Work in chemistry area that uses his arts training.	Foundation Art Studios, upper level studios in Graphic Design

EMERGING THEMES

Consistencies emerged during the interviews in the form of three over-arching themes and eight sub-themes when reviewing the data from the conversations with each of the participants. The interviews began with a series of questions about their perceptions of the impact of their arts experience on their continuing studies and careers. However, these questions served as prompts for a more organic dialogue that ensued. For the three participants who were prior design majors, they were eager to share their experiences with the researcher about their lives since leaving their studies in that field. For the four participants who had completed non-arts majors, the conversations began with friendly banter that helped to create confidence in the researcher and build a willingness for them to share their stories.

As indicated earlier, key words or phrases were identified and used to develop codes that would help categorize the responses. Included were phrases from the different dialogues that carried similar meanings or intentions. From the coding and analysis of these interviews, the resulting overarching themes fell into three categories: 1) Structural, 2) Emotional, and 3) Transitional.

In the case of the Structural category, several sub-themes became apparent but were eventually combined into two sub-themes including 1a) Understanding Complex Systems and 1b) Bridging Interests. Based on the coding seen in *Table 3 — Summary of Themes,* the words began to describe elements of choice, decision-making, and making connections across complex systems and elements. Respondents consistently mentioned issues relating their arts experience to increased understanding of organizations and complex systems. All of them described ways that they could bridge their interests in the arts and their current work or field of study, with most expressing a keen desire to do so. In her interview, study participant Traci, for instance, described how she wanted to use her design and illustration skills to improve patient/doctor

communications. She sees opportunities to create illustrated and educational materials that could help not only patients but also her fellow nursing students.

For the Emotional category, addressing elements of productivity and effectiveness, three sub-themes emerged from the dialogues with all respondents. These sub-themes included elements of 2a) Patience and Persistence, 2b) Collaboration and Teamwork, and also 2c) Personal and/or Professional Communications. Nearly all participants mentioned aspects of one or more of these three sub-themes as being an important and transferable skill from their arts training. Study participant James said his theatre class was the most influential in this regard. Besides confidence, he said, "Actually, [theatre] taught me teamwork...because everybody needs to be on cue" (James, recorded personal interview, July 9, 2013).

A third major category that emerged, Transitional, is based upon narratives where many of the respondents described either a positive or negative experience to a period of transition in their lives and/or careers. Where the first two major themes were anticipated based upon the literature review, this third category emerged from the interviews more emphatically than expected. The connection of their arts experiences to their personal transitions were very pronounced for several of the interviewees. For some of the participants, these were described as "ah-hah!" moments; but for others it was tied more to economic reality checks. Some of the works examined in the literature did touch on the value of the arts in addressing human conditions (Catterall, 2009; Eisner, 2002; DeBotton, 2013, November 2). Pink indicated two areas in what he listed Empathy and Meaning as two of the six senses involved in creative work (2006). The narratives gathered in this research were consistent with this literature, and offered strong connections between practice-based arts and navigating challenging transitional human experiences.

Three sub-themes were identified in the Transitional category, including 3a) Disillusionment, 3b) Inspiration, and 3c) Transformation. For study participant, Brea, one aspect of her transitional experience was inspired by seeing her mother struggle while Brea was growing up. Her mother passed away from cancer shortly before Brea began her college studies. “She barely had a GED [and] she always worked in a nasty shop,” says Brea about her mother; “I don’t mind working. I come from a long line of people who would die on the job! ...But...If I can create things for other people that makes them happy, it makes me happy. And that’s my ultimate goal!” (Brea, recorded personal interview, June 24, 2013). *(See Table 3. Summary of Themes.)*

TABLE 3. Summary of Themes

Major Thematic Categories, Sub Themes and Key Words or Phrases

Major Theme	**STRUCTURAL**		
Sub Themes	Understanding Complex Systems		Bridging Interests
Key Words or Phrases	structure, order, broken down, built up, possible choices, complex system, simplify, details, grey area, variability, process, parameters, time management, [to look at] code, unwrap, extrapolate, foresight		[in context of art and career] mix, work together, bridge, combining, transition
Major Theme	**EMOTIONAL**		
Sub Themes	Patience & Persistence	Collaboration & Teamwork	Personal & Professional Communications
Key Words or Phrases	patience, learn, move on, mistake, cope, [to] handle, emotions, how to deal, balance, stress relief, get it done, problem-solving, think, conscious, discipline	teamwork, different perspective, confidence, together, we [were], different ways, peer	verbal/talking, communicate, clear, concise, to the point, talk, asking questions, convey
Major Theme	**TRANSITIONAL**		
Sub Themes	Disillusionment	Inspiration	Transformation
Key Words or Phrases	shady, final straw, questioning [self-doubt], phase, just a [job], pay cut, want to/have to, exhausting, know better, paycheck job, too hard, discouraged, mind-numbing, robot, rough	family, paying attention, realize, decision, faculty [name], reward, creativity, soothe, break the mold, wanting to know, discover, interesting, interact,	awakening, maturing, goal, surprising, appreciation, enjoy, possibilities, appealing, discover

Note: The keywords listed do not include the many synonyms that might have been used by different respondents.

1) THE STRUCTURAL THEME

As described above, in analyzing the coded conversations from the participant interviews, three major thematic categories emerged. The Structural theme came from repeated statements by participants that demonstrated their belief that there were aspects of their arts and non-arts education and experiences that enhanced their understandings of connections across both areas, or within their current field. This theme was then coded into sub-themes with participants addressing two major areas: 1a) Understanding Complex Systems and 1b) Bridging Interests. Overlaps can also be found in the examples from each of these sub-themes and become apparent when reviewed in the context of the full conversation. See *Table 3 Summary of Themes* for the key words and phrases associated with these sub-themes. Examples that demonstrate each of these sub-themes from the interviews follow.

1a) Understanding Complex Systems

This was a sub-theme that nearly all of the participants described in one form or another using phrases with similar meaning or intent that highlighted a connection between their arts experiences and recognizing complex systems. In the case of the two female respondents who had completed arts degrees, they expressed some concern that their prior arts training might cause them to "over-think" a subject in their new STEM field. However, most described a positive connection between their prior arts training and their ability to understand complex systems.

Ray — Metaphors Between Music and Circuit Boards

Ray, an electronics technician for an automotive supplier, has his associate degree in electronics with no immediate plans for another degree. A guitar player who had a brief career playing in a small band with some friends, he said that he originally

intended to complete a music major in order to compose better music for his band. But he later switched his major to electronics, an area he knew from his family business, after he had difficulty with a vocal music course. Undaunted, he continues to play and compose music with another former member of his band. In his job as an electronics technician, he described how he applied lessons from his studies in music to the way he approached testing the circuit boards at his job.

> ...[I] took away from music theory...the basic way that a song is structured...[with] small parts all coming together. Most prefer that it be done in a certain order... [W]hen I'm at work opening up a circuit board, or [software] program, I'm thinking kind of along the same lines... They can be broken down or built up pretty similarly once you get right down to it... Instead of notes of music, you have wires on a circuit board, or lines of code in a program. (Ray, recorded personal interview, June 16, 2013)

Ray was able to not only find parallels between writing music and building a circuit board or software program, but he saw them as metaphors which helped him to apply the lessons learned from his music composition training to this STEM industry.

Hannah —The Creative versus the Technical Mindset

For Hannah, who earned a degree in art and design, she expressed frustration trying to get beyond her "creative mind" and into her "technical mind." Having just completed a Bachelor of Science in Information Systems, Hannah is currently a stay-at-home mother who is considering a career in computer forensics. Prior to completing her degree in information systems, Hannah had worked in design and data entry for an automotive supplier that published service and owners' manuals. As for her most recent studies, she says, "Just getting away from the creative mind and getting into the

technical mind... was a hard transition... and still *is*. And it's going to [continue to] be a big challenge for me" (Hannah, recorded personal interview, June 23, 2013).

When it came to her classes, compared to her classmates, Hannah thought that her prior design training sometimes caused problems. "I would be over-thinking it too much," Hannah said. "And (I'm) thinking 'Why is this *taking* me so long?' ...I can't really say that it's necessarily a bad thing." She further expressed that, compared to other people in her field without arts training, "I don't know if it [art/design] might be a curse. It might take me longer because I'm thinking more" (Hannah, recorded personal interview). However, she also described seeing "problem-solving" as having positive benefits and a strong commonality between her design studies and potential future career in forensics, as well as "asking questions" in order to come to a solution (Hannah, recorded personal interview).

Traci —Complex Systems and Multiple Choices

In yet another example, Traci, a nursing student with an associates degree in art and design, excitedly described why she believed that her prior art and design training that involved working around a problem might actually hinder her success in her nursing program, especially when it comes to test-taking. As she describes her study habits, "You're trying to take a very complex system, like your body, and simplify it so people can understand it... and it's not easy for [any] student to do" (Traci, recorded personal interview, June 27, 2013).

> That's why I'm screwing up [on tests]... [W]e're given four possible choices for what we should do [in a given] situation. And I'm like, they're all possible choices! ...I'm gonna do all those things! A, B, C, D, and E... [A]nd I'm going to explain to

you why I chose them! [And] I will draw you a diagram!" (Traci, recorded personal interview)

Traci's design training had taught her to look at problems from a variety of different angles, a process taught as "design thinking" (Wallace, L., 2010, January 10). However, Traci found it difficult to set aside this now-ingrained approach in order to follow the stricter step-by-step processes required in her nursing program.

Ralph — Becoming a Better Observer of Small Details

For Ralph, who has an Associates degree in Applied Science in Criminal Justice, and who had also made significant progress towards a degree in theatre, the training he received in the latter helped him understand aspects of his criminal justice program. For example, Ralph described, "We might have a minute to look at a scene, but then answer 50 questions... And you're trying to remember little details..." For Ralph, he believed that his training in theatre helped him with understanding some elements of his criminal justice studies (Ralph, recorded personal interview, June 17, 2013).

Brea —The Iterative Process and Creative Discovery

In her interview, business management major, Brea shared how she came to recognize the value of process, failure, and discovery as she moved between what she called her more "book intensive" business courses and her studio art courses. She described how she could easily take tests in most of her business courses successfully without much worry. But with her art courses, which required many practice and planning iterations, she would procrastinate and try and produce a final product at the end without the interim stages of development.

> It was always stupid things that were where I knew better! Like thumbnails [small drawings of ideas and planning]. Those are important! Me? I was like, 'Why? Isn't the finished product the most important thing?' No. Having a plan was equally important... [Doing thumbnail drawings] is part of the process. And the process is just as important. (Brea, recorded personal interview)

Brea also described not wanting to settle on an idea that was not perfect in her view. "[T]hat was where I got stuck a lot. And so [my art instructor] was really helpful with that, and having those parameters set" such as iterative due dates (Brea, recorded personal interview). Learning the iterative process helped Brea begin to open up to different ideas that could be explored without fear of it not being perfect from the beginning.

James — The Grey Area Between the Arts and Computer Science

Another participant, James, offered his perspective on both the connection and contrast between his training in several different arts courses and his career in computer technology and programming. Working for an automotive manufacturer, James had earned both an Associates in Arts (AA) and an Associates in Science (AS) simultaneously. He recalls taking several classes in piano, along with a theatre and visual arts course while eventually focusing his studies in computer science. Currently, he is pursuing a bachelor's degree in information technology.

"[W]ith science and math... there's always a right answer," he says; "There's always a method of getting to the right answer. But with the arts, there is never a right answer.... You can push the truth... the perception" (James, recorded personal interview).

James describes his art classes as sometimes being a struggle due to the variability of the process. "I had trouble with it...[In science and math] there's no grey

area. And arts just blew that out of the water. It's always a grey area. That *is* art, the grey area in life." But James further describes his own philosophical interpretation of the contrasts between his understanding of the arts and computer sciences.

> ...The arts [are] so particularly fascinating because I could never write a computer program that takes the human perception of art. Like, I could write a computer program that tells the computer all the laws, if you do this, this is breaking the law, and you get this much time, blah, blah, blah. Over time, there's going to come to a point where there's got to be that grey area and the computer cannot see the grey area unless I tell it to see the grey area. But... if I tell it to see that grey area, it's not really there!" (James, recorded personal interview)

Embracing uncertainty, as James describes in the "grey area" that he gained from his arts experiences, has allowed him to see both the different modes of thinking between the two sides, but also where he can push the limits of his computer programming and explore potentially new approaches.

Zeke — Visually Unpacking Chemistry Shorthand

Zeke, who earned an Associates in Applied Science in Art and Design, and an Associates in Science in Chemistry expressed how he found his training in the former extremely helpful in the latter. Planning to transfer to a regional technical university to pursue a bachelor's degree in chemistry, Zeke said he has always had to balance his interests between the arts and sciences. He described the usefulness of his visual training as follows:

> I'd say that with chemistry, being able to visualize things in your head [is useful]. I can picture [the element's structure]. I can rotate it in my head, and I can really manipulate...to get an understanding of the shapes. Because when chemistry started adding some shorthand... I have to unwrap it back into something that makes sense to me. (Zeke, recorded personal interview, June 12, 2013)

Zeke indicated that his ability to reinterpret the chemical symbols both visually, and 3-dimensionally in his imagination has provided him with a key skill that he attributes to his success in his chemistry studies.

1b) Bridging Interests

The sub-theme of Bridging Interests between their arts training and non-arts fields was expressed in a variety of ways by the interview participants. In several cases, there was an expressed desire to create a crossover career that actively utilized training from both areas. In other cases, there was an expressed preference of keeping the arts as a separate entity from their main career.

For Ray, having graduated just before the community college launched a Music Technology degree, he can still envision the possibility of going into the technical side of music. “It’s always a possibility,” he said. “It’s the perfect mix of what I do for a living, and what I do for a hobby” (Ray, recorded personal interview). However, at the time of the interview he said he did not have any plans to return to college to pursue another degree.

Traci — Using her Illustration Skills for Communicating in Nursing

The option of combining her prior career in design and illustration with her current studies in nursing is clear to Traci who said “I meant that was my goal going in that I would find a way for [art and nursing to] work together” (Traci, recorded personal interview). Expressing frustration for the obscure terminology and description of medical concepts in her nursing textbooks, Traci continues:

> ...[I]t might start happening. Because, like I said, when she [the instructor] was explaining [a lesson], I thought I could just go home... and make a quick animation of exactly what she's talking about. I'll send it to her, make sure it was cool [accurate], and share it with everybody [fellow students] so that they would understand it. (Traci, recorded personal interview)

Traci provided another example of the value of potentially bridging her arts experience in communicating with patients.

> I have considered it [patient communication/illustration as a next career step]. [T]here are times, like I said, when I was at the nursing home, there were clients there who couldn't speak. And who couldn't hear. But they could see. And they couldn't see well, though. So to write little words was difficult for them. But, if you drew a picture, they understood it. You know, you draw a picture with a plate, and a fork and spoon on it, and a question "do you want to eat?" they understand that. They would answer you. That was how we bridged communication a lot of the times. (Traci, recorded personal interview)

Traci, as with Zeke, could see visual interpretations of more scientific biological processes and even basic healthcare concepts, allowing for a potential opportunity to bridge her career interests.

James — A Potential Future Creating Apps for Piano

For James, who continues to play piano and take formal lessons when he can fit it into his schedule, he learned from an uncle that members of older generations from his family had also played the piano. James described how his uncle suggested that he bridge his hobby and profession by creating an app that teaches others how to play the piano. "...And I've thought about it a lot. So using that creative, along with the technology, and bridging it." He continues on "...It's unlimited, just combining what I do, and what I love" (James, recorded personal interview).

Brea — A Business Plan Involving the Arts

The idea of creating an entirely new enterprise that bridges her degree in business management, and her hobby in the arts, is becoming a reality for Brea who has already begun steps to launch an online business in up-cycled fashion accessories. Dressing up old purses and ties with designs she created, she began to sell them to friends, family, and workmates.

> I guess I kind of realized that having my own business, whatever it ended up being, was my ultimate goal. But... going to art classes, and seeing that there are so many different areas that you can use art in, and own a business... I can take these management skills and I can translate them into using what is something I've always enjoyed, which is art and designing things, and just sitting down and working with my hands and creating something that someone else says 'That's awesome!' (Brea, recorded personal interview).

Brea's excitement was apparent in how she saw the value of applying her arts training to any kind of business she started. But she was especially enthusiastic about being both the creative person and having the business training to get her started on a successful venture.

Zeke — Seeing New Potential Careers Bridging Arts and Chemistry

In the interview with Zeke, who is looking forward to a career in chemistry, he discussed how he learned about some crossover career opportunities that would bridge his arts and chemistry interests. He told the story of meeting a chemist who was involved in developing pigment colors for well-known consumer products. This led him to realize that, in addition to his chemistry degree, he might have an advantage: "There are not many chemists who have an understanding of art... I have this understanding of art AND

I have the degree in graphic design... That's kind of what I've been considering. That would be a really good marriage of art and science" (Zeke, recorded personal interview).

2) THE EMOTIONAL THEME

A second major category, the Emotional Theme, also resulted from the interviews with participants, including three sub-themes: 2a) Patience & Persistence, 2b) Collaboration & Teamwork, and 2c) Personal & Professional Communication. See *Chart 3 Summary of Themes* for the key words and phrases associated with these sub-themes. While there are potential overlaps with the Structural Theme, some details from the discussions made these more appropriate for inclusion under the Emotional theme, as will become apparent in the material that follows.

2a) Patience & Persistence

As alluded to by several participants in their stories included under the Structural Theme's sub-theme Understanding Complex Systems, lessons from their arts experience often included iterative practices towards an outcome. Learning patience, and the need to persist, was mentioned in one aspect or another by every one of the participants. For several of them, this was described as a growth experience where they learned to accept that a moment failure in the process is not the same as being a failure. Instead, by persisting one can go on and learn from those experiences.

Ray —Learning from Experiences

For Ray, an Electronics Technician, he described his experience in music as helping him when things go wrong on his job.

> ...One of the things I quickly learned was that you can't let any of those things get to you.... Learn from it, don't let it get to you. Just keep going... So, in Electronics,

> if I fry a circuit board, or completely destroy something, break a tool. Okay, I didn't see that coming, and I know I'm not going to make this mistake again. I move on. (Ray, recorded personal interview)

Ray sees these so-called failures as learning opportunities from which he can grow and improve his understanding of his field.

Ralph — Conflicts, Character,s and Patience

For Ralph, a single father of two teenagers, his theatre training also helped him deal with conflict. "Talk about it. Have your moment, and keep it moving," was his philosophy for dealing with conflict at home or among the "characters" he would encounter both on and off the job.

> I think it's about how to cope, how to deal, how to (long pause) handle experiences. Because, at least for me, in the performing arts, you deal with a lot of different emotions. Sad, or happy, or energetic, or empathetic... I think I took a lot from that... how and when to feel certain things... [P]ersonally, that helped me, those [theatre] classes. (Ralph, recorded personal interview, June 17, 2013)

For him, it was also about learning to cope, as Ralph puts it, with the monotony of a factory job: "I think my performing arts is, you know, how to deal with certain situations. When I'm at work, ...I know I'm there. [pause] I *have* to be there. It's a job, not a career. So, it's just the thing. Theatre, it teaches you good coping skills" (Ralph, recorded personal interview).

James — Practice Makes Patience

In a similar manner, James describes how learning to play piano taught him patience and confidence:

> [Be]cause my fingers, and it's just like this [pause] muscle memory. So the more you do it, even though it doesn't look like you're making any progress, you really are... In life, it's always good to have patience. Like when you're stuck at a traffic light. Or [pause], there's a deadline coming in, [and] no one's done their part, their share. [laughing] That patience kicks in. (James, recorded personal interview)

By way of example, James described how he handled a recent situation at his job as a computer technician:

> ...[W]e had this deadline. And the deadline kept changing. So, I remember coming home... I was practicing my fingering [on the piano]... and, time just flew by... I didn't even feel the time. And it made me feel better; I got a better rest when I went to sleep that night. I had a better perspective on it the next morning. And we did actually beat that deadline, so everything worked out! (James, recorded personal interview)

James has found a positive connection between the patience he has developed from his hours practicing piano and his ability to navigate the stressful challenges of his career.

Brea — Learning Persistence and Finding Structure

For Brea, patience came in the form of learning how to pace herself so she could work through the stages of an assignment: "The thing I had the hardest time [with] was... time management. And those (art) classes... you can't just take two weeks to bang out an assignment. You have to have this thumb nailed, and done, and then [pause] do it again!" She described this as "really hard for me." But, she said, "I also think it was one of those necessary evils in my life. I needed to find a way to make my own structure." Her persistence also taught her "to kind of decide quickly what my idea is that I need to

roll with and get it done. And then I'd have more time to maybe get it to be the best it can be" (Brea, recorded personal interview).

Hannah & Zeke — Different Approaches to Developing Patience

Persistence was an important element learned from her arts training as described by Hannah when she took on a challenging project while working for her former employer. Without the proper software, she was asked to design an owners manual in Arabic, saying she had to try a lot of different approaches, testing each option until she could make it work: "We were trying to find a whole lot of different ways to do something before we tried [a graphic software]." Although she was able to persist in working towards a solution, she said "...there were a lot of problems, even before we got started on the project" (Hannah, recorded personal interview).

In a similar fashion, Zeke attributed his art and design experience to teaching him patience. "When I am going to draw a picture, or any composition on the computer, it takes a lot of foresight, a lot of patience," Zeke shared. He offered advice to others, saying "[i]f you apply yourself to art, it's a fun way to learn a virtue like patience, and foresight" (Zeke, recorded personal interview, June 12, 2013).

2b) Collaboration & Teamwork

Although not mentioned quite as often, collaboration and teamwork were either mentioned directly, or inferred by many of the participants as attributes gained from their arts experiences. Sometimes one or both of these attributes were described in conjunction with the earlier sub-theme of patience and persistence. Ray, for instance, said "...[T]wo big things I've picked up just from being in music were teamwork, which is

essential for music, and patience" (Ray, recorded personal interview). For Hannah, she found that her design training taught her about collaboration, especially from the standpoint of problem solving. In her work for the automotive supplier/publisher, she said that by asking questions, she could work with her manager and others to "try and problem solve before [reaching] the end result" (Hannah, recorded personal interview).

James — Finding Confidence in Collaboration

For James, he said that his arts exposure helped him gain confidence to first apply for jobs and then collaborate with others at work.

> ...[W]ith technology right now with computer programming, it's never just somebody sitting at their desk all by themself now. It's not like that no more. Three or four people might get together and it's a team effort. You do the first part, I do all the calculations, you do the intro, you do the arts and graphics, and then we all get together... I was more confident, and I wasn't as shy. (James, recorded personal interview)

James attributed his ability to obtain his current job because his arts experience, which included having to perform in front of others — even if it was just other classmates, helped to boost his confidence to work with others.

Brea — Confident Collaboration and Vision

In developing her own business, Brea described her success in collaborating with her brother to design her new website after waiting months for him to do it on his own: "We got together [and finished it]...in 20 minutes. I said 'this is what I want, this, this and this. Make it happen!' And he's like 'What if we, oh hey, how about this?' And that's all it took. He's like 'I don't know why it made such a difference!'" (Brea, recorded personal

interview). For Brea, that ability to collaborate was born from her ability to persist through her art courses.

2c) Personal & Professional Communication

Communication, or the ability to express their ideas to others, was mentioned by many of the participants as being an important skill learned through their prior arts training. This included communication in both personal and professional situations.

Traci — Keeping Communications Concise

Traci, the nursing student with a degree in art and design, indicated that communication was a particularly valuable lesson for her on a number of different levels. Whether communicating with her employers or the nursing faculty, she described the importance of being concise and direct:

> Communication is a big one. Because I've never spoken with my (freelance) bosses... [E]verything is through email communication, and if you look at the way my current [nursing] program is set up... they'll set up a meeting with you, but you have 15 minutes and you have to get to the point of what you need to say. And anything else, you have to email them. You have to be clear, concise, and straight to the point... So, I've learned with that communication, [when] I can't verbally communicate with them, like, physically talking to them, if they don't understand my typing, then... I would draw them a picture of what I don't understand... That was the hardest thing to learn was how to communicate with people. (Traci, recorded personal interview)

In Traci's situation, she found that she could literally and figuratively draw upon her arts training to be better understood by her supervisors or nursing instructors.

Ralph —Seeing Through the Masks People Wear

Ralph, the criminal justice major who also had extensive coursework in theatre, aspects of communication emerged in the form of recognizing the characters he saw others playing, or masks that people wear in their daily lives:

> I think we all wear a different 'mask' or give performances. [pause] Depending on where we are, you may be different here than you are at home, or at work, or with your girlfriends or friends... Everyone's a character. You have some quiet students, happy students, talkative... [I]t's the same thing at any manufacturing, or any place.... People have their quirks, and qualms. (Ralph, recorded personal interview)

By recognizing that people present themselves differently in different contexts, Ralph became more confident in recognizing how to present himself in different situations.

James — Recognizing Different Approaches

Making a connection between creativity, his experience as a computer technician and programmer, James said "...You just look at things... from a different perspective." James provides an example related to his work:

> Just in the wordplay of any program.... Let's say I want to write a program that will tell if the number that's inputted is odd or even. Now, there's a lot of ways to go about that. ...Some people may take 20 steps. Others might take 5 steps. And that's about the creativity and how you look at it. And...thinking outside the box. (James, recorded personal interview)

James realized he was recognizing that one can communicate the same idea or instructions in a variety of ways.

Hannah — Applying Visual Clarifications in Coding

For Hannah, a former designer turned information systems graduate, she found it necessary to address her programming both visually and functionally so that it would be more professional on both fronts:

> ...I was using the split screen [in Dreamweaver] instead of just using Design [view], or just Code [view in designing a website]... I had to look at how it was being designed, and flipping from how it was looking in the browser versus [waiting until] after I was done writing the code. (Hannah, recorded personal interview)

As she moved more heavily into coding and programming in her information systems degree studies, Hannah found herself designing those assignments, too:

> ...I had to make sure [the practice program] was perfected to the way I wanted to visually see it, even though I know that other students... just wanted to get the program right and make sure that it's running. Me? I had to be, like, visually right! ...It had to be visually appealing for me to look at! (Hannah, recorded personal interview)

Hannah found that while it might slow her down to make her code more "visually right," she also found that her work could communicate more clearly once completed.

Zeke — Making Sense of an Idea

In a crossover example with the sub-theme of Complex Systems, Zeke described his perspective on transferring his art, design and communications skills to his new career path in chemistry:

> ...I guess that's the big part of art [and design], making something sort of make sense. Making something that must convey an idea and in a compact transparent way to somebody. [In chemistry], I have to take someone else's information and extrapolate out what they're trying to convey. (Zeke, recorded personal interview, June 12, 2013)

When it came to describing more complex communications, Zeke described what he felt were the major differences in how he approached his math and science subjects versus his design courses:

> If you do a math problem, you only need to show that the numbers come out right. You don't need to defend why you used the angle/angle/side theorem. You used it because that's what you had to use... [With art and design] it was very much learning about how to think about what you're doing consciously... I got to think critically about why I was choosing to do something. If I chose to do [a design with] a bamboo sprout, it was because it represented youth and vitality and strength, conveying that symbol to the people of Viet Nam, rather than, well [saying] ...bamboo is just a plant that grows in Asia. (Zeke, recorded personal interview, June 12, 2013)

Zeke made it clear during his interview that he felt there was a difference between learning software in his former design field, and the design thinking and confidence in communicating that he also learned in those classes:

> ...Out of everything I learned, it was the thinking parts that were the most important. I mean, anybody can figure out how to learn Photoshop. You can get books and you can do that. But it's more difficult to talk to people on your own. Getting up there and sharing your art with other people, saying this is why I did this campaign, having the peer reviews. That sort of stuff was really useful. (Zeke, recorded personal interview)

In making the distinction between his creative training and learning the software tools in the design field, Zeke indicated that he recognized that his arts training impacted the way he approached problem-solving and communicating more esoteric concepts.

3) THE TRANSITIONAL THEME

This third major thematic category was not immediately anticipated to be as strong as it emerged in the preparation for this research study. However, through the

organic nature of the dialogues with the study participants, strong thematic elements of transitional life experiences developed. The interviewees were eager to share their personal stories. In nearly all cases, their educational and career transitions were inspired by either economic or life events which helped precipitate their change in direction. Within this category, three sub-themes parallel three stages of human development including: 3a) Disillusionment, 3b) Inspiration, and 3c) Transformation. See *Table 3 Summary of Themes* for the key words and phrases associated with these sub-themes. For some participants, the transition was more pronounced than others. Some participants were still in the process of transitioning. But in all cases, there was a shift from their original direction or thinking towards a new goal. In this section, a brief description of each of the sub-themes is described first.

3a) Disillusionment Sub-theme

The Disillusionment sub-theme was described as a turning point for many of the study participants and often involved a change in focus for their major or career direction. In some cases, it was precipitated by economics. The Great Recession (2007-2009) was cited by several as a key factor. In at least one case, the death of a close relative led to a shift in direction from the usual family expectations. For another participant, finding it too difficult to satisfactorily pass a required class in his original major, forced a rethinking in his direction. And for yet another participant, the economic pressures that came with parenthood forced what he felt was a more practical direction.

3b) Inspiration Sub-theme

The Inspiration sub-theme often overlapped with disillusionment when the precipitating event also served as a positive inspiration for a new direction. In several cases, the inspiration came from external influencers such as an instructor, relative,

friend, or an acquaintance. In another case, inspiration came from what she described as an “awakening” to national and world events. For another participant, inspiration came from an intense desire to understand the function of the tools she used in her job. And in several cases, inspiration came through a process of discovery in unexpected places.

3a) Transformation Sub-theme

The Transformation sub-theme was not apparent in all of the interviews, but emerged as an area of continuing development and the beginning of new opportunities in their future, as described by several of the participants. Since the majority of these participants have not spent very long in employment, if at all, in a field related to their latest degree pursuits, the period of transformation may still be ongoing. It is included here because, for some of the study participants, it was more pronounced and shared with enthusiasm as part of their personal story.

Since the three sub-themes parallel stages of human development that often flow without clear markers between them, this section is organized by the individual study participants’ narratives to maintain the continuity of their story and provides examples of the subthemes included within the narratives.

Ray, Musician/Composer and Electronics Technician

For Ray, the band guitarist now working as an electronics technician, his disillusionment began with what he describes as a reality check: “I thought, okay, if I take these music theory classes, I would get better at writing [songs], and, well, [the band would] become international superstars!” Ray continues, “...You know, in my 18-year-old mind that was the perfect idea. [laughing] Nothing could possibly go wrong!”

Reality for Ray set in when, originally a music major, he received a barely passing grade in a required vocal music and sight-singing course: “That was kind of the final straw... I was kind of realizing that, unless I was going to become a superstar, or uh, a music teacher... At the time, I didn’t see too many possibilities with my music degree if I was to go and pursue it... [laughing sarcastically] I couldn’t just submit my resume [for a job as a superstar] and have it go through.” Ray also expressed his disillusionment with what he described as shady practices by music promoters and agents he had read about and even encountered occasionally with his band. During the interview, however, Ray expressed curiosity about the community college’s music technology degree that was just being developed when he graduated with his associate degree in electronics.

Ray’s inspiration for his career shift came from his family who had run a business in computers and electronics in another state when he was growing up. Electronics, he said, was a natural transition for him to move to once he realized that a full-time career as a musician might not be a viable option. While Ray said that he was happy with his job as an electronics technician, as mentioned in an earlier sub-theme, he said he does not rule out exploring the idea of bridging his interests in music and electronics. For now, Ray says that music continues to provide what he describes as “emotional fulfillment” providing balance to his current job in electronics (Ray, recorded personal interview).

Traci, Designer/Illustrator and Nursing Student

For Traci, a designer/illustrator who recently began her nursing degree, her disillusionment came from her work in a niche area of the publishing industry that she had been so keen to pursue. When the opportunity came to actually work in her desired field of illustration after graduation, Traci excitedly said, “Yes! This is the thing I wanted to do! This is God’s plan for me. He’s pushing me in this direction... Things were great! I

was making money. I was doing what I loved... It was like a dream come true, really! It sounds silly to say it this way, but that was literally what I thought!" (Traci, recorded personal interview)

"What ended up happening was the economy... It tossed a wrench right in there," Traci said. After enjoying several years of success, she was having increasing difficulty with her freelance employers who were asking her to perform more and more work for less pay, and often delaying the pay, at one point for as long as eight months. Having always thought of herself as a successful professional, Traci began to experience self-doubt: "I started questioning myself, you know. Am I really as good as I thought I was? Or am I really just a bad employee? Do I have a terrible work ethic? It was 'No!' to all of that!" (Traci, recorded personal interview).

Traci's inspiration came in the form of what she calls "an awakening" when she started to go to church and pay more attention to news of the world around her during the worst period of the Great Recession. "When you're concerned about paying the bills, you do things like watch the news," she said. "I always had a predisposition to wanting to go into nursing. I really did. I just was raised with the mentality of "take care of yourself [and] don't worry about other people." She said that she came to realize that not only did she care about what other people thought of her professional work, she realized *she* cared about *other* people in general.

> I want to say I grew up! (excited) …and out of that selfish phase of doing exactly what I wanted to do, because 'Hey! I make comics! I'm boss!' Well, at some point you realize that you have to start taking care of other people, too. You have to extend... Because your [personal] world is tiny and insignificant. You start to look around and you start to see there's a lot of people who need help. And there's a lot of people who need help giving help, as well as, you know, doing good things. And that's, I don't know, it clicked! (Traci, recorded personal interview)

Traci said she did not make the decision to give up on her career in publishing without do her research: "...I did a lot of talking around. [I spent time] just asking myself, is this [nursing] what I really want to do? 'Cause it's not an easy decision to make to leave the career you've established." Calling it part of her maturing as an adult, Traci continued describing her frustration with her former persona:

> ...I just wanted to go back and punch myself in the face. [speaking very excitedly] Why are you so greedy?! Why are you acting like this?! There are bigger things in the world besides you! And you're one little insignificant goal and (even with) that you're not really that happy with it any more (Traci, recorded personal interview).

Ralph, Actor and Criminal Justice Major

For Ralph, an actor making his living on an automotive assembly line and a single father, his first step away from either a career in criminal justice or theatre came from what he describes as a commitment to his son in order to gain custody: "...Having kids generally changes your perspective on life. The things that I want to do, you know, don't always coincide with the things I have to do..." Describing himself as a very proud father of a son who will soon be heading off to college himself, Ralph continued, "I didn't want [my son] to feel the things that I felt not having my father around. And wonder, and everything that comes with having, you know [pause], I guess, emptiness."

Ralph also described a period of disillusionment in the form of a quandary as to whether he would continue pursuing a bachelor's degree in criminal justice. "I started working on my bachelor's. Now I'm just undecided. 'Cause I can make great money at [the auto factory], or I can make decent money. And some of the things that I was

looking into as far as criminal justice, that would be like a pay cut... So that's three or four years of starting over [with the pay scale] which I can't see myself doing." Ralph described a concern for whether he would enjoy his work in criminal justice, especially with the low pay, saying, "You have to have a love. Which is what I found out. That's why it had me rethinking on whether [or] when I come back to finish my bachelors. Will it be in criminal justice? or will it change to something else?" Ralph admitted his preference, saying "...I think if I come back, I'll probably go for a degree in the performing arts. I mean; that's where my heart is" (Ralph, recorded personal interview).

Working third shift at the automotive factory has allowed Ralph to continue to seek out acting jobs, especially now that his children are nearly grown and heading off to college. He has been able to audition for commercials, and movie spots due to the state's film credit, and proudly describes having acted in a pilot for a new sitcom:

> Theatre, for me, [pause] sometimes it's a way of escape... It's the possibility of, well, doing something you love. You'd do it for free, because you love doing it. Punching a clock for someone else you do because you have to... especially for my line of work [in the automotive factory]... The money [in theatre] is phenomenal if you get into acting, and get jobs... when you can get it. So definitely the reward [for me] outweighs the means (Ralph, recorded personal interview).

James, Piano Player and Computer Technician

For James, there was less of an issue of disillusionment, but rather a transition from uncertainty to what he finally decided he wanted to focus on for a degree. He described himself finding that his arts experience provided a much-needed balance to the more technical work in his job as a computer technician.

James said that his exposure to different art forms offered some benefits in the way he thinks about things: “I think it’s positive, too... You just look at things different, from a different perspective.” For James, “the piano is just different” compared to his usual work, which is “so technical all the time, it’s exhausting” (James, recorded personal interview). Describing it as something that “soothes” and “relaxes” him, James says the piano helps take his mind away from the stresses of his job.

James also described an early resistance to taking the arts classes while in college, and later finding balance between his career choice and music. “I believe [the piano classes] created balance. I think there are people who only want to take a certain type of class [in their non-arts major]... I think everybody has it in them, this creativity. But I think certain classes kind of pick that up and hone in on it. And, I think that surprisingly shocks people... because it did me.” James describes his own transformation saying, “I wasn’t [prepared]. I was like ‘I don’t want to take this... It has nothing to do with my curriculum! ...But, after I took it, I took another [arts] class just like it!” He said he got hooked.

Brea, Up-cycled Fashion Entrepreneur and Business Management Major

Brea’s choice to pursue a business management degree came from her intention to manage a restaurant. However, disillusionment came for Brea while working as a waitress and occasionally as temporary manager for the restaurant: “I know that if I didn’t take art classes, I would have ended up managing a restaurant,” which, she now describes as being “...just a job.” Brea shared how while growing up in a farming family she was discouraged from pursuing any kind of art-related career. “You can’t make a career out of art,” Brea says she was told, continuing “that’s kind of what you get drilled

into your head." But for Brea, whose mother passed away from cancer just as Brea was starting her college studies; she took on the responsibilities of caring for her younger brother while also raising her infant son. She also awakened her to her mother's advice, finishing her degree five years after she started, saying she was inspired by her mother's words. "There's a world full of possibilities!" Brea said, very excited. "And I don't think I would have had such an appreciation for that if I wouldn't have listened to my mom...to find something that [I] like [to do]!"

Brea sees herself as breaking new ground in her family: "I showed my grandpa the previews of my website, and he was like 'Oh, this is really amazing!'" Brea responded telling her grandfather that he "could have been encouraging when my mom was a little younger so we wouldn't have been so driven to do a paycheck job." As far as Brea's shift from her family's preference towards the factory jobs her mother and other family members had taken over the years, she said "...I'm trying to break that mold for myself and my brother, and other people in my family... You know, I don't have to keep it [art] as just a hobby. It can be something I can use to make me money, and *enjoy* what I'm doing" (Brea, recorded personal interview).

Hannah, Designer and Information Systems Major

Even before she graduated with her Associates in Applied Science in Art & Design, Hannah indicated she was interested in knowing more about the technical side of the software: "Well, why can't we look at the code [in web design]? That's what got me started [pause] wanting to *first* know what the heck this computer I'm using is all about! And then, second, especially with web design. [pause] There's *got* to be an easier way!"

However, Hannah's disillusionment came from the challenge of graduating with her design degree during the early years of the Great Recession: "...It was too hard for me, I guess. I just wasn't really up for the challenge... I was getting discouraged trying to find a job." When she finally did get a job for the automotive supplier laying out the service and owners' manuals, she called it as "just mind-numbing work." She described her inspiration to make a change as coming from a very difficult project producing one of the 400-plus-page manuals in Arabic: "Needless to say, I worked a lot of overtime... That was a rough start [to her career]. [long pause] But it was good because it got me thinking … that there was a whole other language." Her decision to start pursuing a different direction that led her to information systems came when she and her fiancé discussed starting a family. After their first child was born, Hannah pursued her new interest by finishing her bachelor's degree in early 2014.

Zeke, Designer and Chemistry Major

Zeke has been working for the county district library even before he began his studies in art and design. Rather than seeking a job in the design field, he continued his studies completing a second Associate's degree in chemistry. He described his transition as follows:

> For a while, I knew that graphic design wasn't where I wanted to end my career. I wanted [long pause], I found myself still doing math problems for fun, and still studying my chemistry books because I enjoyed it. And I thought to myself, there are so many more people who wanted to do graphic design rather than chemistry. So if I liked doing something that has a field that... a lot of people actually loathe math and science, math more so, I think...There are a lot better graphic designers than I am. Can I offer something to that field that would improve that field? or affect a lot of people in that field in a good way? I thought I

> could bring more to the chemical field, just because it's more exclusive because people don't do it as much (Zeke, recorded personal interview).

Zeke said he came to the conclusion that he could make a bigger difference in the sciences than he could in his art-based field. He expressed a keen desire to pursue an area of chemistry that had a relationship to the arts so that he could capitalize on his arts training.

ANALYSES OF FINDINGS

Presented in this chapter were the findings and results of a qualitative study that included interviews of the seven study participants who had all pursued STEM or non-arts studies. Most importantly, the participants also had differing degrees of exposure to studies in the visual and performing arts while at a community college. For these participants, their STEM or other non-arts field of study was either already, or would possibly become, their primary career direction.

After applying keyword coding, a series of primary themes from the interview conversations emerged, including 1) Structural, 2) Emotional, and 3) Transitional. Another eight sub-themes emerged under these categories and were described in more detail in the preceding text. Consistent with this kind of phenomenological study approach, extensive use of narrative from the interviews was used to convey the subject's experiences and perspectives.

To offer further analysis of the results, revisiting the first research question under study is important. This research question asked: *How important is creativity, which has been inspired by a practice-based arts experience, to students' success in their educational experience and career development as perceived by STEM or non-arts-majors and graduates?* An analysis of the findings from this study revealed that the

majority of subjects felt that their arts training had benefited them in one way or another, either by directly or indirectly enhancing their ability to address complex systems on the job. This finding was determined based on the responses from nearly all study participants sharing stories which referenced the process, planning, and ambiguity that came from their arts experience and how they applied the lessons they learned from those aspects to their non-arts field of study or employment.

Regarding the perceptions of the value of creativity raised in the research question, a second major finding indicated that creativity emerged most often in the area of bridging interests. Most of the study participants described with intentionality, a desire to seek opportunities to connect their arts and non-arts career training with the potential of building a new career. In several cases, the arts training was seen as playing a major role in shaping their future plans.

The research question also addressed the participants' perceptions on the role of the arts in their ability to be successful, either in their studies or career aspirations. The study findings indicate that nearly all of the participants identified their arts experience as preparing them to persist in spite of failure or difficult personal or professional challenges. Patience, persistence, or both, were described by most as being important to their current success in their career or current studies, and as having been derived from their training in the arts.

Perceptions of success for many of the participants also were connected to their ability to collaborate or work in teams, and with different people. Attributed to their prior arts training, especially in music or theatre, but also in design, study participants described the collaborative nature of much of the visual or performing arts as benefiting their non-arts studies and work.

Another major finding indicated that the majority of participants perceived that success came in the form of improved communications skills, due in part to their prior arts experiences. This was especially true when working under limited time constraints, dealing with different personalities, or conveying complex ideas in simpler terms. The majority of respondents indicated that this was a valuable and transferable skill, especially for those with prior degrees or extensive studies in the arts.

In an area of research results that were less anticipated in its strength, three additional findings emerged which were consistent with stages of human development, and have been included under the Transitional thematic category. This theme can be seen in the context of the participants' perceptions of their own personal journeys to overcome life challenges. Whether the arts played a positive or negative role seemed to depend upon whether the study participant had originally made a career in the arts or not. For two former arts majors, Hannah and Traci, the Great Recession undermined both their careers and their confidence and led to their decision to head in a different direction, returning to college to pursue another degree. Changes in family brought about personal challenges to two other study participants, Brea and Ralph.

Another stage in the Transitional Theme, inspiration, was found in the stories from many of the study participants, albeit at different levels. For instance, two of the participants, Brea and James, both found their arts experience inspired them, but in different ways. Brea discovered an intense desire inspired by her late mother to forge a new path that would allow her to use both her creativity as nurtured by her arts training and her business management training. James found the arts inspired a way of creating balance between his personal life and work. The last stage that completed the Transitional theme was transformation where nearly all of the participants in the study

described some period of change in their direction that, for good or for bad, was precipitated or mitigated by their arts experience and, quite often, was still in progress.

The findings were somewhat more ambiguous in addressing the second research question which asked: *Do graduates from STEM or non-arts fields at a community college who have taken one or more practice-based visual or performing arts courses, believe that their prior arts experience gives them an edge on their non-art colleagues?* Participants like Zeke and James indicated that their prior arts experience may actually give them an edge over their non-art peers. For Zeke, it was directly related to his potential career options, such as building a career in chemistry where his prior arts training could give him an edge in chemistry in certain areas of product development. James believed that his arts training helped him understand programming differently than his non-arts colleague. But for James, Ralph, and even Ray who found parallels to his music composition training, their arts experiences also provided a balance when addressing stressful situations.

In the next chapter, potential conclusions will be drawn from the findings and placed in the context of the broader literature on the research subject with potential implications and recommendations made for further discussion and research.

CHAPTER 5: INTERPRETATIONS, CONCLUSIONS, & RECOMMENDATIONS

INTRODUCTION

In this final chapter, the results from the research described in the previous chapter are discussed in the context of the larger body of scholarly work. The coding and analysis of data that was described in Chapter 4 that resulted in the thematic categories will be discussed, and interpretations offered. Conclusions will be offered as to the data's support of the original research questions and implications will be discussed. Finally, as appropriate, recommendations will be made for future research and potential actions at institutional levels.

REVISITING THE RESEARCH QUESTIONS

The original research questions that this study was based upon asked about student perceptions of the importance of arts-based creativity on their success in their studies or careers in non-arts areas. The findings, based on interviews of seven current and former community college students, indicated a generally positive connection. Research question #1 asked about student perception of their success in their non-arts majors: *How important is creativity, which has been inspired by a practice-based arts experience, to students' success in their educational experience and career development as perceived by STEM or non-Arts-majors and graduates?* In Chapter 3, a potential outcome for future recommendations was made based on the possibility that one might see improved success levels among students who were not college-ready as they started their careers. However, since data were not provided on student GPAs nor

on their developmental placement, this part of the hypothesis cannot be addressed directly. A quantitative study, as recommended later in this chapter, could address this aspect of student success and the arts.

The second research question then asked if the students perceived that their arts training offered any advantage to them over their peers with little to no prior arts studies: *Do graduates from STEM or non-arts fields at a community college who have taken one or more practice-based visual or performing arts courses, believe that their prior arts experience gives them an edge on their non-art colleagues?* In Chapter 3, a potential outcome was suggested that if these students expressed a perceived value for their experience in practice-based arts courses, then there may be an opportunity to consider the arts for inclusion in core graduation requirements. Since the interviewees did indicate a strong perceived value under a variety of areas as outlined in Chapter 4, this hypothesis is addressed later in this chapter in recommendations on curriculum, programs and general education.

An analysis of the data revealed patterns that were then systemized into three over-arching thematic categories and eight sub-themes *(See Chapter 4, Chart 3. Summary of Themes).* In examining the participant responses, the results show strong consistencies to the larger body of literature. When asking the question of "why" participant responded as they did, I come to a number of conclusions that are built upon other theories and studies of creative arts and student success. This chapter is organized generally around the major themes identified in Chapter 4, in the context of larger theories as presented by other studies in the literature.

UNANTICIPATED ALIGNMENTS

When I was undertaking this study, there were aspects of the findings that I did not anticipate would emerge as strongly as they did. For instance, the results from this

study indicate a strong alignment with findings from the cognitive research found in the literature as discussed below. In addition, the impact derived from these participants' arts experience would emerge in such a consistent range of themes. While I understood that collaboration and bridging interests might emerge as important themes, to the extent that the participants identified areas of patience, persistence, organization, and understanding complexity, the results were stronger than expected. The larger Transitional theme that emerged demonstrates that the role of the arts in the transitional experiences of the participants is consistent with the transformational potential described in a recent social identity study in Scientific American MIND addressing creativity and social groups (Haslam, Adarves-Yorno, & Postmes, 2014). The findings from my own study also show that the arts provided either a catalyst for change in a harsh economy, or an escape from the mundane work of factory settings. These and other points are discussed further below.

DISCUSSIONS BASED ON THE STRUCTURAL THEME

From the study findings, a conclusion can be drawn that the arts nurture forms of creative thinking that create a necessary balance to critical thinking and improve understanding of complex relationships and systems. The Structural Theme identified in this study was determined from a variety of references by all the respondents about their stated improvements in areas of organization, time management, and/or increased understanding of potential connections of otherwise complex systems.

Logical vs. Creative Thinking

Sir Ken Robinson, who writes about creativity in education, indicates that "Creative insights often occur by making unusual connections: seeing analogies between ideas that have not previously been related" (Robinson, K., 2001, p. 158). He

suggests that creativity “involves breaching the boundaries between different frames of reference” (Robinson, 2001, p. 158-159). Described as “bisociation” where one learns to think and see potential connections across unrelated planes rather than in a linear way, Koestler also suggests that “disciplined routines of thought ...may become an impediment to the creative leap” and that “the temporary relinquishing of conscious controls liberates the mind from certain constraints” (Koestler, 1989, p.169). Similarly, study participants often described their arts experiences as contributing to aspects of their non-arts work or studies by seeing connections that may not be traditionally accepted. The interviewees who came from non-arts majors backgrounds, such as James and Brea, described overcoming a creative hurdle in their thinking that is akin to Koestler’s “disciplined routines of thought” (Koestler, 1989, p.169).

The reverse could also be true. For example, study participant Traci, the designer/illustrator who was back in college pursuing a nursing degree, expressed an excited frustration because she saw potential applications in all of the answers offered in multiple choice questions for course exams in her nursing program. She believed she could not only explain the different ways that each of the answers might be appropriate, but that she was even willing to illustrate those connections visually. Another study participant, Hannah, who also was a designer who had gone back to study in a STEM field, she said she found herself taking longer with some of her Information Science assignments in part because she believed she was “over-thinking” the problems. In some ways, Hannah demonstrated that she was practicing the same problem-solving design thinking approach she had been taught as a visual artist. However, she perceived this as distracting her from seeing the more direct answer being sought by her instructors. While her prior training involved iterative processes to generate ideas, she may not have been comfortable enough to make judgments on the value of the ideas

she was generating, thus taking her longer to commit to a particular direction than her classmates who may have approached the problems in a more linear fashion.

This ability to see hidden or non-traditional connections within complex systems is consistent with the experiences of others in the study who expressed it as a positive aspect of their arts training. Study participants Ray and James, both of whom studied music, found metaphors to connect their music training to their current work in computer technology and programming. The application of visualization and metaphor was well developed both by Zeke, the designer-turned-science student, and Ralph, a criminal justice graduate and theatre student. These two participants provided examples of how they could recall elements from their field of study in a visual manner that helped them improve their understanding of challenging situations.

There may be a connection between the intensity of prior arts training and the level of immersion in the STEM or non-arts field of study that impacts their ability to critically assess how to apply the structural connections. The use of visualization and metaphor can be seen as increasing in value as the participants increase their understanding of the non-arts field of study. For Hannah and Traci, they had not yet worked in their new STEM fields, since only Hannah had recently graduated with her new degree and had chosen not to return to the workforce right away. Traci, who was still enrolled in her nursing degree program, had just begun the more practical clinical portion of her studies.

Often attributed to split-brain theories of right versus left-brain attributes pioneered by Roger Sperry (Wolman, March 15, 2012), where the left hemisphere was considered to control more logical thinking and the right hemisphere more holistic or emotive thought, the participants in this study demonstrated an ability to use the “left-brain interpreter” that Gazzaniga (Wolman, 2012) says assists in sorting the maelstrom of information, such as the swirling of more imaginative thinking that the participants in

this study allude to experiencing. Carl Sagan said that one could not tell “whether the patterns extracted by the right hemisphere are real or imagined without subjecting them to left hemisphere scrutiny.” Saying that critical thinking must be done in conjunction with creative and intuitive thinking, Sagan indicated that both hemispheres are crucial to addressing complex problems (Sagan, 1977). He goes on saying that “the brilliance of our most recent evolutionary accretion, the verbal abilities of the left hemisphere, obscures our awareness of the functions of the intuitive right hemisphere, which in our ancestors must have been the principal means of perceiving the world” (Sagan, 1977, p. 168-169). Based upon responses from the participants in this study, conclusions can be drawn that experience in practice-based arts may improve both critical and creative thinking and the ability to practice what Sagan called “simultaneous” and “parallel” right-brain thinking (p. 169) in how one approaches the challenges in their personal or professional lives.

Balance vs. Bridging Interests

When considering the sub-theme of bridging the arts with other professional interests, some conclusions can be drawn from the manner in which the participants proposed to accomplish this. While all participants expressed recognition of the potential opportunities to bridge their interests, not all of them expressed a strong desire to do so. In several cases, the participants stated a preference for using their arts experience to provide a parallel relief from the stresses of their non-arts jobs or careers. In the case of Ralph, for example, the criminal justice graduate focused on theatre in his life outside of the automotive factory, his work as an actor enables him to relieve himself from the mind-numbing work he endures on the assembly line. Stifled from nurturing his ability to innovate at his job, Ralph uses his acting work to overcome what Ritzer describes as the

irrational nature of the “dehumanizing setting” (2008, p. 32) of the highly rational factory. Often stated in terms of providing balance to their lives, it may be concluded that the arts provide an opportunity to recharge akin to dreaming that Sagan suggested as the strongest period when right-brain thinking is unfettered by left-brain logic (Sagan, 1977, p. 170).

Structural Theme Summary Conclusions

In light of the theories of Koestler, Robinson, Sagan, and others, conclusions can be drawn for this study that participating in experiential art courses has allowed these participants to strengthen their intuitive and creative thinking, and has also increased their awareness of the potential connections in complex systems. It has done so by nurturing the symbolic right-brain thinking that allows them to manage information from a variety of different inputs. This may be due to their having learned to approach a problem in a multi-associative manner as taught through their music, art and design courses, thereby improving both critical and creative thinking, and offering the potential opportunities for more innovation to occur.

DISCUSSIONS BASED ON THE EMOTIONAL THEME

For the Emotional theme, it can be concluded that the ability to stay engaged and persist through challenging and complex problems in work or studies has a direct relationship to participation in practice-based arts courses. Patience and persistence, identified as a sub-theme *(See Chapter 4, Table 3. Summary of Themes)* in the current study, are attributes described by nearly all of the study participants as having been learned and reinforced in their arts training.

The Iterative Process and Engagement

Through many of the examples provided by the study participants in Chapter 4, the ability to persevere, and patiently work through complex challenges show parallels to well-established approaches to training in the visual and performing arts. In this manner, the practice of iteration shares a strong relationship with aspects of the Structural Theme and the ability to understand complex systems described earlier. Different from approaches used in lecture-based art history or appreciation courses, the iterative process is identified as a vital aspect of "studio thinking" in a study by Hetland, Winner, Veenema, & Sheridan (2013). The authors believe the skills derived from studio thinking and its related processes have positive benefits that are directly transferable to other fields of study. In describing the "Engage and Persist" disposition, for instance, Hetland, et al. emphasize the direct relationship between persistence in the arts and engagement in other areas saying "When one is engaged, one is intrinsically motivated to persist" (p. 52). Continuing, the authors explain that "[p]ersonal engagement means that one gets pleasure out of the work itself, rather than simply working at something for some future goal" (p. 52). In terms of the current research, the research participants all agreed that they were able to transfer their skills gained from the iterative process in the arts, namely persistence and patience, to their current work in STEM or other non-arts fields.

There is potential innovation that comes from persisting through the process of trial, practice, failure and discovery. Hetland et al., describe another of their dispositions, called "Stretch and Explore" as involving a willingness to combine exploration and risk-taking. The authors say that artists "play, take risks, explore novel associations, and make mistakes, not deliberately, but routinely and inevitably" (Hetland, et al., 2013, p. 91). Eisner agrees, suggesting that the ability to persist can lead to new discoveries (Eisner, 2002). He indicates that "the act of expression is also an occasion for revising,

even discovering and altering purposes" (p. 99). Eisner also describes the arts as providing iterations in the form of "sequential opportunities to work on problems..., time to get a feel for that material, and time to learn how to cope with problems engendered by the material..." (p. 96).

Putting the iterative process in the context of a work environment that could benefit from innovation gained from risk-taking, Rosamund Stone Zander writes in *The Art of Possibility,* "If we include mistakes in our definition of performance, we are likely to glide through them and appreciate the beauty of the longer run" (2000, p. 102). By way of example, she goes on to describe how composers such as Mahler and Stravinsky created passages in several works that were intended to truly challenge the soloist, even intending the passage to sound strained as played by the musician. Acknowledging that this attitude can be frowned upon in a modern competitive culture, Zander nonetheless finds value in the risk of failure, stating "The risk the music invites us to take becomes a joyous adventure only when we stretch beyond our known capacities, while gladly affirming that we may fail. And if we make a mistake, we can mentally raise our arms and say, 'How fascinating!' and reroute our attention to the higher purpose at hand" (p. 103). For study participants such as Zeke and Ray, this process of learning from mistakes and moving forward, rather than meeting them with frustration, is described as a direct outcome of their experiences in music and visual arts.

Metaphor and Communication

This issue of risk-taking also involves a certain element of vulnerability, especially in the context of the ability to successfully communicate ideas that may be outside the norm. The study participants indicated that they gained valuable communication skills from their visual and performing arts courses, such as the ability to

present, defend, and share ideas that were outside the norms. Some examples are described in Chapter 4.

In order to communicate the results of experimentation and the iterative process, a more metaphorical approach may be needed in order to capture the meaning of the distilled ideas. To prepare for these ambiguities, practice-based arts training involves many critiques, performances, and continuous feedback, eventually developing the ability to express the creative thinking behind ideas being presented in the form of metaphor. Writing about her theory of presentational symbolism and metaphor and her philosophy in the arts, Susanne Langer wrote “Whatever resists projection into the discursive form of language is, indeed, hard to hold in conception, and perhaps impossible to communicate... [and therefore] we resort to metaphor, ...something analogous” (1979, p. 23). For study participants such as Zeke, metaphor and distillation were described in his example of his ability to communicate ideas about his design project. Based on the responses from study participants like Zeke and others, a conclusion can be drawn that the ability to visualize and interpret metaphors can enhance understanding and communication of the symbolic meanings behind concepts applied in STEM fields, or what study participant Zeke called the “thinking parts” of his art training (Zeke, recorded personal interview).

Collaboration and Social Identity

While not identified specifically by all of the participants, confidence was often alluded to in the conversations with study participants, especially in the context of collaborating with others. Thematic findings from this study on teamwork and collaboration are also consistent with recently published research on personal and social identity and the role of creativity. The study shared in *Scientific American MIND* indicated that the collaborative spirit may actually nurture creativity if a strong social

identity for the group has been formed. The authors believed that “social — but not personal — identity bolstered enthusiasm and encouraged people to stay with the creative task in the face of challenges” (Haslam, Adarves-Yorno, & Postmes, 2014). That sense of “shared social identity” is necessary for the group to persist, regardless of the topic. Based on this theory, the social identity of the study participants as members of a non-arts community, but with a personal identity as an artist, puts the individual in the position of becoming a potential transformer. In keeping with the Haslam study that in one example had subjects write statements to present to a group, “the more the participants identified with the group, the more their statements involved creative challenges to that group norm, possibly because...[they] feel the greatest responsibility to the group or the most able to effect a transformation” (Haslam, et al., 2014). The authors believed that “to be celebrated rather than vilified, innovators need to know the norms they are departing from” (Haslam, et al., 2014). A conclusion can be made that as an accepted member of a STEM group, the study participants with arts training also understand the agreed-upon norms of their non-arts group and have the confidence needed to challenge them.

Emotional Theme Summary Conclusions

Based upon the responses from the participants, a conclusion can be drawn that the ability to communicate using visual and verbal metaphor is a direct outcome of practice-based arts training but that it also provides an ability to bridge the creation of new ideas with the more analytical applications of them. In addition, the ability to work collaboratively can lead to innovation, especially if the team includes members who have arts-based training giving them a personal identity outside of the group's social identity. As innovation is one of the key ingredients to a growing economy as discussed in

Chapter 1, this crossover of social and personal identities can be a valuable asset to student development and success.

DISCUSSIONS ON THE TRANSITIONAL THEME

Although emerging far stronger than anticipated, this theme clearly is connected to outcomes of human development that occurred due to individual personal or professional challenges. Conclusions on the role of the arts can be drawn based upon the parallels to theories on student development from Chickering and Reisser (1993). As they faced their economic or personal challenges, which were described in sub-themes of Disillusionment, Inspiration, and Transformation in Chapter 4, the study participants described points in time where the arts were identified at the point of transition leading to future growth. Consistent with the larger body of research, a conclusion can be drawn that their arts experiences serve to mitigate the transition that students face in and out of their college life, providing a point of initiation, a foundation to build from, or a balance that may counter the challenges at hand.

Disillusionment and Vectors of Identity and Purpose

For nearly all of the study participants, their transition began with some moment of disillusionment that predicated a change in direction. Advocating heavily for collaborative and experiential learning opportunities, Chickering and Reisser identified what they referred to as “The Seven Vectors” for student development (1993, p. 38). As already discussed in this and earlier chapters, collaboration is an important transferable skill gained from experiential training in the practice arts.

Consistent with the “Vector #5 Establishing Identity” described by Chickering and Reisser (p. 175), some element of crisis usually precipitates a shift in direction. Building on theories from J. Marcia (1966, in Chickering & Reisser, 1993, p. 175), “two

psychosocial tasks" occur and begin with some kind of crisis. The authors indicate that this crisis does not necessarily have to be an emergency, but could be any kind of challenge or stimulus that sets off a change in direction. The next task involves "commitment" to that change which could involve anything from one's occupational direction, or it could be more value-related (p. 175). For the study participants, the transitional crisis impacted their sense of personal identity leading to a disillusionment with their current status, whether it was their current employment area of design or publishing as was the case with two of the design majors, or a challenge to their established identity as both a musician and good student that forced a rethinking of direction for another participant.

A commitment to a new direction also parallels the sixth vector identified by Chickering and Reisser as "Developing Purpose" (1993). According to the authors, "[d]eveloping purpose entails an increasing ability to be intentional, to assess interests and options, to clarify goals, to make plans, and to persist despite obstacles" (p. 209). Although authors like De Botton argued for the artistic product as a medium that helped humans address their "troubles of inner life" (November 2, 2013), for the participants interviewed in this study, it was the process of *creating* art as described in many of their narratives that helped them through the process of creating purpose, direction, and balance in their lives.

Transitional Theme Summary Conclusions

In a moment of interesting coincidence, Chickering and Reisser use the performing arts as a metaphor for how education needs to transition in its support of student identity development: "With a firm sense of self as [an] artist...tomorrow's graduates will not be bound to a single instrument" (Chickering & Reisser, 1993, p. 208).

They continue, “[r]egardless of the roles they assume or the demands of the performance, they will know how to bring forth their best talents and contribute to the greater whole” (p. 208). For the participants in this study, I can only conclude that how the arts helped or hindered the study participant’s development of identity or purpose is entirely dependent upon the individual’s own story. While some conclusions can be drawn that an educational arts experiences may help provide a foundation to build upon in overcoming personal or professional challenges while also providing an opportunity for balance, for nearly all of the participants interviewed for this study, the transformation is ongoing with stories of their future development yet to be told.

OVERALL CONCLUSIONS & IMPLICATIONS

The respondents’ narratives have generally supported the original research questions, which focused heavily on student perceptions. The first research question focused on whether the participants believed their STEM or non-arts studies and careers benefited from their studies in the practice-based arts. After an analysis and coding of the data, the findings were consistent with the other theories and research from the literature. While not all of the participants intended to be art majors when beginning their studies, they all indicated that creativity, in the form of elements they identified as transferable from their arts training, was important to various aspects of their success in their non-arts fields of study or careers. James, who indicated his skepticism about taking his first art course at all, was pleasantly surprised by what it brought to the rest of his studies in terms of creative thinking, patience, and collaboration. Student development theories, such as those from Chickering and Reisser, are consistent with the perceptions of this group of study participants, and would seem to support a move

from STEM to STEAM by adding in a practice-based arts component to community college education.

Regarding the second research question that asked whether the study participants perceived an advantage over their peers who may not have taken any prior practice-based arts courses, the results were less conclusive. Most of the respondents had not worked very long, if at all, in their STEM or non-arts field. During their studies in these non-arts areas, the respondents indicated that they were unfamiliar with how their work measured up compared to their peers in terms of grades, and most were unwilling to make speculations in that regard.

When further considering the findings from this study, conclusions can be drawn that the iterative process learned in their visual or performing arts courses maintain engagement in challenging tasks through practice, failure, and discovery. It does so by instilling in students what the respondents described as increased levels of patience, persistence, improved communications, confidence, and collaboration. As well, the participants indicated their belief that these elements have been beneficial to their work in their non-arts fields. The results, when reviewed in the context of the larger body of literature, indicate that engagement and confidence have increased as a result of their exposure in the participatory arts courses. Engagement especially has been connected to persistence and patience that are recognized by educators as key factors in student success.

Innovation can be the result of a variety of factors, and the findings from this study indicate that the combination of an increased understanding of complex systems, as well as increased confidence derived from the process of critique or performance, is conducive to working in collaborative teams. Indications are that there may be increased opportunities for innovation and success when social identity theories are considered. Implications for building a strong social identity with a group in a STEM field, for

example, while having a personal identity that diverges, such as a musician or artist, may create increased opportunities for innovation.

When we consider the perceptions of the study participants in strict alignment to the research questions, the results suggest important implications for how we value the role of the arts in STEM fields. This applies specifically to participation in practice-based arts courses such as music, theatre or studio arts and design, rather than lecture-based courses alone. While it is difficult to extend the results of this study due to the limited participation of only seven respondents, if we were to consider the thematic categories that resulted from an analysis of the data, the findings indicate strong consistencies with the larger body of literature on the role of the creative arts in education. While not definitive due to the small sampling, the study indicates that these current and former community college students believe that their prior arts experiences give them the ability to visualize or verbally describe in metaphor elements of complexity. Far from being unchallenged by their arts courses, the respondents transferred their persistence through an increased engagement in their non-arts fields, also described by many of the study participants as increased patience and ability to cope in the face of challenges.

RECOMMENDATIONS FOR FUTURE ACTIONS

The recommendations from this research fall into two main areas. First, several recommendations are made for continuing this line of research in future studies. Additional qualitative studies can be done at a larger scale in order to determine whether the results of the current research can be independently verified. Furthermore, community colleges should take an active role in researching this area at an institutional level, determining not only student perceptions, but also determining the potential feasibility of longitudinal quantitative studies.

Secondly, recommendations are also offered regarding potential changes to curriculum, program design, and educational policies for community college. Educational leaders should keep in mind issues of feasibility, student impact, institutional costs, and anticipated results as they explore options for operationalizing the results of this and future studies.

Recommendations for Future Studies

Recommendations for further studies include addressing clear indicators of success as defined by the community colleges. This has been a strongly debated area especially since community colleges have a variety of ways of defining student success in light of the multiple missions of these open-door institutions. While success was rarely defined specifically by the study participants, community colleges generally identify student success as follows: a) graduation, b) persistence (from one semester to another), c) transfer, d) GPA, and e) career. When examining the data set from the midwestern urban community college that provided the initial sampling, student GPA was unavailable due to restrictions in confidentiality. Because the names of students were included in this initial data-set, good qualitative research practices from the college would not allow information as specific as GPA, as well as race/ethnicity, to be provided to this researcher. With institutional cooperation, this study could be replicated at a much larger level using focus groups or questionnaires that build upon the thematic framework developed in the current study.

If a larger qualitative study were undertaken, it could also inform a quantitative study that could be undertaken by the college and then aggregated by field of study, GPA, and transfer. In addition, issues of race/ethnicity and remediation should be considered in any future studies. The data could also be examined by major in the STEM or other non-arts fields. Based upon the limitations of this research, and potential

biases of the researcher, future studies could be done in the form of surveys, building from the responses and thematic framework of the current study. If the focus is to remain on the economic value that comes with improving student success, future studies on the value of the arts could be done with an emphasis on workforce development and tied into key areas of need in the soft skills identified by industry.

Recommendations on Curriculum, Programs, & General Education

When considering potential changes in curriculum, educators in STEM or other non-arts fields could consider incorporating collaborative activities with arts programs in a more formal manner. Another opportunity to consider could have STEM or non-arts faculty working with arts faculty to create a series of modular courses that create short-term deep immersions in theatre, music, or the visual arts. Professional Development opportunities should be created in order to help create an interdisciplinary bridge for faculty to connect learning between the arts and STEM fields. Modular approaches to the arts might be an effective way of allowing students to do quick immersions. Often cited in the literature was the importance of going beyond a cursory introduction to the visual or performing arts by emphasizing the value of time spent in practice. Students could then be allowed to choose one or more of the immersive arts modules to fulfill program requirements in their non-arts program of study.

Another recommendation is that general education requirements could be adjusted to allow students the option of taking a practice-based arts course in music, theatre, studio art, or design rather than limiting choices to lecture-only visual or performing arts lecture courses. Program limitations may not allow the addition of one more required General Education course in an already crowded two-year program of study. However, giving the option of a more experiential arts course to fulfill a General Education requirement may increase engagement in college studies at a critical stage,

especially for students requiring remediation in academic areas of math, reading, or writing. Adjustments along organizational lines could allow for more interdisciplinary work between faculty and disciplines opening up new ways to integrate the arts into other fields, and vice versa.

RESEARCHER REFLECTIONS

> Students must be grounded in the basics... These basics include the ability to allocate resources; to work successfully with others; to find, analyze, and communicate information; to operate increasingly complex systems of seemingly unrelated parts; and, finally, to use technology. The arts provide an unparalleled opportunity to teach these higher-level basics that are increasingly critical, not only to tomorrow's workforce, but also today's. (Eisner, 2002, p. 34)

The quotation above, while attributed to an anonymous "chief executive officer of a large corporation" (Eisner, 2002, p. 34), illustrates many of the points addressed in the findings from this study. The community college students interviewed in this study perceive value derived from their arts training when entering non-arts careers. The above quote is but one example of how leaders in business and industry recognize the relationship between arts experience and workforce development. As one of the primary missions of community colleges, it is incumbent upon us to pay attention as we move forward in determining new approaches for improving student success, especially in light of pressures from government and our communities for increased accountability.

Throughout the development and implementation of this study, I have attempted to set aside my own biases on what role the arts may play in student success. As someone who has had a lifelong connection to the arts, I found it puzzling when calls for educational reform were often met with a two-prong approach; first, to increase standardized testing, and second, to cut arts programs in favor of a stronger focus on

more “academic” subjects. Research already indicates that music studies have strong connections to improved performance in math scores. Yet cash-strapped public K-12 schools quickly eliminate music and art teachers when budgetary axes are dropped in favor of increasing standardized tests.

Today in community colleges, we face the consequences of this narrow-minded focus on *academics only* in the form of a tidal wave of students who cannot read, write, or do math at the college level. Once enrolled, these newly enrolled community college students then face several semesters revisiting the same material they failed to grasp while in high school. Often dropping out before they ever successfully pass through this remediation, students find themselves separated from their goals, unengaged in their studies, and often demoralized by the delay in starting their intended program of study.

Can the arts help in this regard? Possibly. The answer is not definitive. However, studies indicate that experiential courses can indeed increase student engagement, especially if students are challenged in ways that build confidence. If we were to then extend the issue of engagement further, based upon this study and the larger body of literature, then a case can be made that making the arts available to students in the form of a general education option (or even requirement) may improve overall persistence. At the very least, students who do not need remediation would experience opportunities to build these “higher-level basics” and creative thinking that industry leaders indicate is so important to workforce development.

As I reflect upon the outcomes of this study, I am struck by the number of times the study participants indicated that they continued to gain intrinsic rewards from their work in the arts, even when it was not their primary occupation. Many described it as a means of creating balance in their lives. For quite a few, there was an expressed desire to try and create a new career that bridged both their arts and non-arts training. Eisner reminds us that “intrinsic satisfaction...is the only reasonable predictor that the activity

will be pursued by the individual voluntarily...” (p. 203). Again, engagement appears to be a key factor in their interest in persisting in their arts experience. Further research and implementation of pilot initiatives that would examine the relationship between the practice-based arts experience and elements of student success —such as persistence —may help reveal new opportunities to create the graduate of tomorrow, one who is prepared for the variability of a future where change is the only constant. As Eisner writes, “One lesson the arts teach is that there can be more than one answer to a question, and more than one solution to a problem...” (p. 196). A lesson for education is that “in the arts diversity and variability are made central” (p. 197). To prepare our students for the variability of an uncertain world, the arts may provide an important educational tool in their future success.

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APPENDIX
A: SAMPLE LETTER OF INTRODUCTION

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates

RECRUITMENT LETTER

(This may be distributed via email, regular mail, or social media as deemed appropriate.)

Date

Dear ____(Name of former community college student),

My name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student with Ferris State University's Community College Leadership program. In the latter capacity, I am the principle research investigator conducting a study on creativity.

I am writing to invite you to participate in a study examining the role of the creative arts for former students in non-arts careers. These students may have taken one or more practice-based visual or performing arts courses while attending a community college.

As a former student at Mott Community College, sharing your experiences may be a very valuable learning opportunity for others. I am particularly interested in learning more about your prior experience in the arts and how that experience may or may not have played a role in your current career development.

The main objectives of this research are (a) to understand the relationship, if any, of prior college coursework in visual and/or performing arts on success in other fields of study; and (b) to explore how any prior coursework in the arts may have contributed to success in one's career development for STEM (Science, Technology, Engineering or Math) or other non-Arts majors.

Your participation and identity will be kept confidential. However, some participants in this study may elect to have their identity made public.

I am looking for participants to take part in a one-hour focus group interview to be held at the Mott Community College library. And, if you are interested, one-on-one interviews will be conducted with those wishing to participate further.

Participation in this study is completely voluntary with no known risks. While there may be no direct benefits to participating, your contributions will add to the body of knowledge of how the arts may impact success in other career areas.

Please confirm your interest in participating in this study by calling me at 810-813-0466 or emailing me at fulmerm@ferris.edu. Thank you in advance for your kind reply.

Sincerely,

Mara Jevera Fulmer
Doctoral Candidate, Ferris State University

Note: For questions regarding the conduct of this study or your rights as a research participant, you may contact the Office of Academic Research Institutional Review Board at the Ferris State University tel: (231) 591-2553 or IRB@ferris.edu. You may also contact the chair of my dissertation committee, Dr. Noreen Thomas, at ***nthomas@ferris.edu****.*

Mara Jevera Fulmer
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APPENDIX
B: FOCUS GROUP LETTER, CONFIDENTIALITY, & CONSENT FORM

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The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates

FOCUS GROUP LETTER
STATEMENT OF CONFIDENTIALITY & CONSENT FORM

Introduction

Thank you for agreeing to participate in this research project. My name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student with Ferris State University's Community College Leadership Program. In the latter capacity, I am conducting a study on the role that the creative arts may play for non-Art majors who have taken one or more visual or performing arts courses while attending Mott Community College.

Purpose of the Study: The aims of this research are (a) to understand the relationship, if any, of prior college coursework in visual and/or performing arts on success in other fields of study; and (b) to explore how any prior coursework in the arts may have contributed to success in one's career development for STEM (Science, Technology, Engineering or Math) or other non-Arts majors.

Confidentiality: Unless given written permission by you to do otherwise, your identity will be kept confidential and specific details that might lead to your identification will be changed and pseudonyms (false names) used.

The information collected here will be used for research purposes only. Any confidential data will be kept secured by storing it on password-protected external hard-drives and will be destroyed when analyses are completed. Interview transcripts will be maintained for future extensions of this research. Results of this study may be published in a dissertation, an academic journal, on a website, and as a conference paper and may include quotations from your interview. While a pseudonym will be used instead of your name, it may be helpful for readers to understand which quotations or narratives came from different individuals. Because you may have achieved success in a field with limited participation, this amount of detail means that your anonymity cannot be guaranteed.

The form below confirms your preference on confidentiality and how you may opt out. It also asks you to provide additional information for background purposes.

Study Procedures: If you agree to participate you will be asked to take part in a one-hour focus group interview in a private room at the local college library. Follow-up calls may be made in order to clarify any questions that might arise. This may require an additional half-hour of your time.

Recording equipment will be used to capture our discussion for accuracy's sake and may include a digital video recorder that captures audio as well. Unless written permission is granted, your image, audio, or video recording will not be made public.

Voluntary Participation: Participation in this study is voluntary. You may refuse to participate, refuse to be photographed, audio recorded, or videotaped, refuse to answer any questions, or withdraw from this research at any time with no effect on your personal status.

Risks: Risks include potential breach of confidentiality and questions of a sensitive nature being asked. You have the right not to answer any or all of the questions.

Benefits: There may or may not be direct benefit to you from participating in this study. When the research is completed, it will help the researcher to understand what relationship(s) there may be between student success in their careers and their prior studies in the visual or performing arts at a community college.

Questions: If you have any questions about the conduct of the study or your rights as a research participant you may contact the Office of Academic Research Institutional Review Board at the Ferris State University tel: (231) 591-2553 or IRB@ferris.edu. If you have any questions about this research, or any comments to make now or at a later date, or if you would like a copy of the published results of this study, please contact me, Mara Jevera Fulmer, at fulmerm@ferris.edu, or this study's supervisor, Dr. Noreen Thomas, at nthomas@ferris.edu.

This letter is yours to keep for future reference.

Statement of Consent

Do not sign this consent form unless you have had a chance to ask questions and have received satisfactory answers to all of your questions.

Participant: *I have read this consent form. I have had the opportunity to discuss this research study with the investigator for this research study. I have had my questions answered by her and the risks and benefits have been explained to me. I understand that I will be given a copy of this consent form after signing it. I understand that my participation in this study is voluntary and that I may choose to end my participation at any time. I freely agree to participate in this research.*

I understand that information regarding my personal identity will be kept confidential, but that confidentiality is not guaranteed.

- _____ *I consent to participate in the research study "The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates."*

- _____ *I consent to participate in (check one or more):*
  _____ *1) an individual interview;*
  _____ *2) a focus group;*
  _____ *3) both*

- _____ *I consent*
  _____ *I do not consent*
  to being contacted at a later time for any clarification required on the focus group or interview responses. (check one only)

- _____ *I consent*
  _____ *I do not consent*
  to being photographed and audio/video-recorded, whether it is during a focus group or individual interview. (check one only)

Statement of Confidentiality:

- *I _____ waive my right to confidentiality and thereby allow my name to be associated with my responses made during these research activities including focus groups and interview.*
- *I _____ do not waive my right to confidentiality and want my identity to be protected by the use of a pseudonym and adjusting personal identity details as much as practical. (check one only)*

Participant Basic Demographic Information: (if consented to provide)

Age: _____ Gender: _____ Racial or Ethnic Identity: _____
School District (at time of attendance at Mott Community College):
_____

By signing this consent form, I have not waived any of the legal rights that I have as a participant in a research study.

Participant Signature: _____

Date: _____ Participant Printed Name: _____

For the purpose of future debriefing and potential follow-up questions for clarification, you are invited to provide your preferred contact information. However, providing this information is entirely voluntary on your part.

Participant Address: (if consented to provide) _____
_____

Participant Email & Telephone: (if consented to provide)
Email: _____ Tel: _____

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believed that the participant has understood and has knowingly given their consent.

Printed Name: MARA JEVERA FULMER Date: _____

Signature: _____ Role in the Study: Investigator

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

APPENDIX
C: FOCUS GROUP INTERVIEW GUIDE

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

The Role of Creative Arts in STEM* and other non-Arts Majors
for Community College Students and Graduates

FOCUS GROUP INTERVIEW GUIDE

Methodology: Using 3-4 small focus groups of 6-10 people, selected from an initial sampling of students from a midwest urban community college, the setting for discussions will be in a library conversation room, 2nd floor. The questions below will guide the discussion.

[The following is presented verbally. Appendix A-2 Focus Group Letter Statement of Confidentiality & Consent Form will have been presented prior to this, but is also referenced during the presentation of the preamble to the actual interview questions and recordings, providing another opportunity to opt out of recording and the focus group in general.]

Introduction: Thank you for joining us today. My name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student with Ferris State University's Community College Leadership Program. In the latter capacity, I am conducting a study on the role that the creative arts may play for non-Art majors who have taken one or more visual or performing arts courses while attending Mott Community College.

*[*STEM - Science, Technology, Engineering or Math]*

Before we begin, I would like to provide you information regarding the confidentiality of your identity. Unless I am given written permission by you, your identity will be kept confidential and specific details that might lead to your identification will be changed and pseudonyms (false names) used. A separate form is provided for you that outlines the details of confidentiality and how you may opt out. It also asks you to provide additional information for background purposes.

In order to assure accuracy in capturing your answers to the questions below, and the discussion that may ensue, I would like to be able to use recording equipment including a digital video recorder that captures audio as well. Again, unless written permission is granted, your image, audio, or video recording will not be made public.

Questions: To begin our discussion, I want to ask you if you could share a little about your current work and then we'll come back to our topic on the arts. We can start by going around the table, but then I encourage you to join in for a more informal discussion.

Q: To get us started, tell me in detail about your current employment and how you came about finding yourself in this work.

Q: I understand that you had some experience in either the visual or performing arts while at the community college. Tell me about that experience.

Q: What motivated you to enroll in any studies in the arts (visual or performing)?

Q: What kinds of things do you think may have changed about your life – personal or professional – due to your studies in the arts?

Q: Tell me about a time when something related to your arts experience seemed to guide your professional work.

Mara Jevera Fulmer

810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

Q: Tell me about how you think your studies in the arts may or may not have impacted your overall success in your professional work. Why do you feel this way?

Q: What else would you like to share about your career and any impact your arts training may have had?

Mara Jevera Fulmer

810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

APPENDIX
D: SAMPLE PHONE SCRIPT OR EMAIL FOR EARLY CONTACT

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates

SAMPLE PHONE SCRIPT OR EMAIL FOR EARLY CONTACT RE FOCUS GROUP OR ONE-ON-ONE INTERVIEW SET-UP

EMAIL SAMPLE:

Dear ___(former Mott student)_____

My name is Mara Jevera Fulmer and I am contacting you in my role as a doctoral student from Ferris State University's Community College Leadership program. I am the principle research investigator conducting a study on creativity. You may also know me in my other capacity as Professor and Program Coordinator in Graphic Design at Mott Community College in Flint, Michigan.

I am writing to invite you to participate in a study examining the role of the creative arts for former students in non-arts careers. These students may have taken one or more practice-based visual or performing arts courses while attending a community college.

As a former student at Mott Community College, sharing your experiences may be a very valuable learning opportunity for others. I am particularly interested in learning more about your prior experience in the arts and how that experience may or may not have played a role in your current career development.

The main objectives of this research are:
(a) to understand the relationship, if any, of prior college coursework in visual and/or performing arts on success in other fields of study; and

(b) to explore how any prior coursework in the arts may have contributed to success in one's career development for STEM (Science, Technology, Engineering or Math) or other non-Arts majors.

Your participation and identity will be kept confidential. However, some participants in this study may elect to have their identity made public.

I am looking for participants to take part in a one-hour focus group interview to be held at the community college library. And, if you are interested, one-on-one interviews will be conducted by those wishing to participate further. Your contributions will add to the body of knowledge of how the arts may impact success in other career areas.

Please confirm your interest in participating in this study by calling me at 810-813-0466 or emailing me at fulmerm@ferris.edu. Thank you in advance for your kind reply.

Sincerely,

Mara Jevera Fulmer
Doctoral Candidate, Ferris State University
fulmerm@ferris.edu
810-813-0466

Professor & Program Coordinator in Graphic Design
Mott Community College
Flint, Michigan

PHONE SCRIPT SAMPLE:

Hello. May I speak to ___(former Mott student)_____?

[If not available…]
Thank you. My name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student with Ferris State University. I'm reaching out to former Mott Community College students who may have taken studio art courses in order to learn how this may have impacted their career development. May I leave my contact information and ask to have _____ return my call?

[If reply is "yes"…]
Thank you. My name again is Mara Jevera Fulmer. My email address is fulmerm@ferris.edu and my telephone contact is 810-813-0466.

[If available…]
My name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student with Ferris State University. I'm reaching out to former Mott Community College students who may have taken studio art courses in order to learn how this may have impacted their career development.

I am calling to invite you to participate in a study examining the role of the creative arts for former students in non-arts careers. These students may have taken one or more visual or performing arts courses while attending a community college.

Sharing your experiences may be a very valuable learning opportunity for others. I am particularly interested in learning more about your prior experience in the arts and how that experience may or may not have played a role in your current career development.

Would you be interested in participating in a focus group? These would be held at the Mott Community College library. They are anticipated to take approximately one hour of your time and refreshments will be provided.

[If yes…]

In addition, for accuracy's sake, I would like to record these focus group sessions using video and audio recording. Will this be okay for you? If not, you may still participate in the focus group but with your name kept confidential. Are you interested in participating?

[If yes…]

Times available for focus group participation include:
Dates_____ Time _____

These will be held at _____ college library on the second floor, room TBD.

[If "No" to Focus Group…]

Also, if you are interested or prefer it, I will also be conducting one-on-one interviews with those wishing to participate further. Would you like to arrange that as well? Or instead of participating in the focus groups? You may choose to do both if you wish.

Since the one-on-one interview times are more flexible, do you have a preference for your dates of availability? These can be arranged at the same location, or elsewhere based on your preference.

[Date_____ Time _____ Place _____]

I want you to understand that participation in this study is completely voluntary and there are no known risks. While there may be no direct benefits to you for participating, your contributions will add to the body of knowledge of how the arts may impact success in other career areas, especially for community college students.

May I reconfirm your email, mailing address and telephone contact?

email _____
telephone _____

Thank you VERY much for your willingness to assist in this study. I will be in touch to reconfirm our meeting times.

In addition, for accuracy's sake, I would like to record these focus group sessions using video and audio recording. Will this be okay for you? If not, you may still participate in the focus group but with your name kept confidential. Are you interested in participating?

[If yes…]

Times available for focus group participation include:
Dates_____ Time _____

These will be held at _____ college library on the second floor, room TBD.

[If "No" to Focus Group…]

Also, if you are interested or prefer it, I will also be conducting one-on-one interviews with those wishing to participate further. Would you like to arrange that as well? Or instead of participating in the focus groups? You may choose to do both if you wish.

Since the one-on-one interview times are more flexible, do you have a preference for your dates of availability? These can be arranged at the same location, or elsewhere based on your preference.

[Date_____ Time _____ Place _____]

I want you to understand that participation in this study is completely voluntary and there are no known risks. While there may be no direct benefits to you for participating, your contributions will add to the body of knowledge of how the arts may impact success in other career areas, especially for community college students.

May I reconfirm your email, mailing address and telephone contact?

email _____
telephone _____

Thank you VERY much for your willingness to assist in this study. I will be in touch to reconfirm our meeting times.

[If "No" to any participation…]

Do you have anything you would like to share briefly now about your prior arts experience at Mott Community College and your current career?

Thank you VERY much for your time.

APPENDIX
E: INDIVIDUAL INTERVIEW LETTER, CONFIDENTIALITY, & CONSENT FORM

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates

INDIVIDUAL INTERVIEW LETTER
STATEMENT OF CONFIDENTIALITY & CONSENT FORM

Introduction

Thank you for agreeing to participate in this research project. As you already know from our previous meeting, my name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student from Ferris State University's Community College Leadership program. In the latter capacity, I am conducting a study on the role the creative arts may play for non-Art majors who have taken one or more visual or performing arts courses while attending a community college. The aims of this research are (a) to understand the relationship, if any, of prior college coursework in visual and/or performing arts on success in other fields of study; and (b) to explore how any prior coursework in the arts may have contributed to success in one's career development for STEM (Science, Technology, Engineering and Math) or other non-Arts majors.

I would like to invite you to share your story and have asked you to meet with me so we may expand upon our earlier focus group discussion. You may address your experience in practice-based visual or performing arts courses at Mott Community College and also share your path towards your current career position.

Confidentiality: Unless given written permission by you to do otherwise, your identity will be kept confidential and specific details that might lead to your identification will be changed and pseudonyms (false names) used. The form below confirms your preference on confidentiality and how you may opt out. It also asks you to provide additional information for background purposes. Following this one-on-one interview, you will be given an opportunity to review the transcript from this interview and will be able to delete, modify, or elaborate on any of your responses, if you so choose. This may require an additional hour of your time.

Recording equipment will be used to capture our discussion for accuracy's sake and may include a digital video recorder that captures audio as well. Unless indicated on the form below with written permission granted, your image, audio and video will not be made public.

The information collected here will be used for research purposes only. Any confidential data will be kept secured by storing it on password-protected external hard-drives and will be destroyed when analyses are completed. Interview transcripts will be maintained for future extensions of this research. Results of this study may be published in a dissertation, an academic journal, and as a conference paper and may include quotations from your interview. While a pseudonym will be used instead of your name, it may be helpful for readers to understand which quotations or narratives came from different individuals. Because you may have achieved success in a field with limited participation, this amount of detail means that your anonymity cannot be guaranteed.

Voluntary Participation: Participation is this study is voluntary. You may refuse to participate, refuse to be photographed, audio recorded, or videotaped, refuse to answer any questions, or withdraw from this research at any time with no effect on your personal status.

Risks: Risks include potential breach of confidentiality and questions of a sensitive nature being asked. You have the right not to answer any or all of the questions.

Benefits: There may or may not be direct benefit to you from participating in this study. When the research is completed, it will help the researcher to understand what relationship(s) there may be between student success in their careers and their prior studies in the visual or performing arts at Mott Community College.

Questions: If you have any questions about the conduct of the study or your rights as a research participant you may contact the Office of Academic Research Institutional Review Board at the Ferris State University tel: (231) 591-2553 or IRB@ferris.edu. If you have any questions about this research, or any comments to make now or at a later date, or if you would like a copy of the published results of this study, please contact me, Mara Jevera Fulmer, at fulmerm@ferris.edu, or this study's supervisor, Dr. Noreen Thomas, at nthomas@ferris.edu.

This letter is yours to keep for future reference.

Participant's Initials _____

Statement of Consent

Do not sign this consent form unless you have had a chance to ask questions and have received satisfactory answers to all of your questions.

Participant: *I have read this consent form. I have had the opportunity to discuss this research study with the investigator for this research study. I have had my questions answered by her and the risks and benefits have been explained to me. I understand that I will be given a copy of this consent form after signing it. I understand that my participation in this study is voluntary and that I may choose to end my participation at any time. I freely agree to participate in this research.*

I understand that information regarding my personal identity will be kept confidential, but that confidentiality is not guaranteed.

- _____ *I consent to participate in the research study "The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates."*
- _____ *I consent to participate in (check one or more):*
  _____ *1) an individual interview;*
  _____ *2) a focus group;*
  _____ *3) both*
- _____ *I consent*
  _____ *I do not consent*
  to being contacted at a later time for any clarification required on the focus group or interview responses. (check one only)
- _____ *I consent*
  _____ *I do not consent*
  to being photographed and audio/video-recorded, whether it is during a focus group or individual interview. (check one only)

Statement of Confidentiality: (check one only)

- *_____ I waive my right to confidentiality and thereby allow my name to be associated with my responses made during these research activities including focus groups and interview.*
- *I _____ do not waive my right to confidentiality and want my identity to be protected by the use of a pseudonym and adjusting personal identity details as much as practical.*

Confidentiality and use of photography, video and audio: (check one only)

- *_____ I waive my right to confidentiality and thereby allow my image, audio and video recording to be used for publications related to this research, whether it be online or in other electronic format.*
- *_____ I do not waive my right to confidentiality and do not wish to have my image, audio or video recording made public except in the form of written transcripts with a pseudonym.*

Participant Basic Demographic Information: (if consented to provide)

Age: _____ Gender: _____

Racial or Ethnic Identity: _____

School District (at time of attendance at local community college): _____
_____

By signing this consent form, I have not waived any of the legal rights that I have as a participant in a research study.

Participant Signature: _____

Date: _____ Participant Printed Name: _____

For the purpose of future debriefing and potential follow-up questions for clarification, you are invited to provide your preferred contact information. However, providing this information is entirely voluntary on your part.

Participant Address: (if consented to provide)

_____

_____

Participant Email & Telephone: (if consented to provide)
Email: _____
Tel: _____

By signing this consent form, I have not waived any of the legal rights that I have as a participant in a research study.

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believed that the participant has understood and has knowingly given their consent.

Printed Name: _____*MARA JEVERA FULMER*_____ *Date:* _____

Signature: _____ *Role in the Study:* ___*Investigator*_____

APPENDIX
F: ONE-ON-ONE INTERVIEW GUIDE

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates

ONE-ON-ONE INTERVIEW GUIDE

Methodology: After participating in a focus group, between 6 to 10 individuals are invited to participate in one-on-one interviews. The setting for these interviews will vary based on the preference of the interviewee. For instance, if they wish to share some artifacts, they may request that the interview be done in their home. Alternatives may be offered including the library conversation room at a local community college, or even a quiet corner of a restaurant. The setting will be flexible and based upon the time and preference of the interview candidate. The questions below will guide the discussion.

[The following is presented verbally. Appendix A-5 Individual Interview Letter Statement of Confidentiality & Consent Form will have been presented prior to this, but is also referenced during the presentation of the preamble to the actual interview questions and recordings, providing another opportunity to opt out of recording and the interview in general.]

Introduction: Thank you for meeting with me today. As you already know from our previous meeting, my name is Mara Jevera Fulmer and I am a doctoral student from Ferris State University's Community College Leadership program. You may also know me in my other capacity as Professor and Program Coordinator in Graphic Design at Mott Community College in Flint, Michigan. As part of my doctoral studies, I am conducting research on the role the creative arts may play for non-Art majors who have taken one or more visual or performing arts courses while attending a community college. The aims of

this research are (a) to understand the relationship, if any, of prior college coursework in visual and/or performing arts on success in other fields of study; and (b) to explore how any prior coursework in the arts may have contributed to success in one's career development for STEM (Science, Technology, Engineering and Math) or other non-Arts majors.

I would like to invite you to share your story and have asked you to meet with me today so that we may expand upon our earlier focus group discussion which addressed your prior experience in practice-based visual or performing arts courses at a local community college.

Confidentiality: Before we begin, I would like to remind you regarding the issue of confidentiality of your identity. Unless I am otherwise given written permission by you in the form provided *[Appendix A-5]*, your identity will be kept confidential and specific details that might lead to your identification will be changed and pseudonyms (false names) used. A separate form is provided for you that outlines the details of confidentiality and how you may opt out. It also asks you to provide additional information for background purposes. Following this one-on-one interview, you will be given an opportunity to review the transcript from this interview and will be able to delete, modify, or elaborate on any of your responses, if you so choose. This may require an additional one hour of your time.

As at our meeting before, in order to assure accuracy in capturing your answer to the questions below, and the discussion that may ensue, I would like to be able to use recording equipment including a digital video recorder that captures audio as well. Unless written permission is granted, your image, audio, or video recording will not be made public.

The information collected will be used for research purposes only. Any confidential data will be kept secured by storing it on password-protected external hard-drives and will be

destroyed when analyses are completed. Interview transcripts will be maintained for future extensions of this research. Results of this study may be published in a dissertation, on a website, an academic journal, and as a conference paper and may include quotations from your interview. A pseudonym will be used instead of your name and efforts will be made not to disclose your identity. However, it may be helpful for readers to understand which quotations came from different individuals, for example. Because you may have achieved success in a field with limited participation, this amount of detail means that your anonymity cannot be guaranteed. If you prefer, and provide written permission, your name may be associated with your quotes and included narrative.

Voluntary Participation: Participation in this study is voluntary. You may refuse to participate, refuse to be photographed, audio recorded, or videotaped, refuse to answer any questions, or withdraw from this research at any time with no effect on your personal status.

Questions: To begin our discussion, I want to ask you if you could expand upon your earlier description about your current work and then I would like us to expand on our earlier discussion on your studies in the arts at the community college.

Q: To get us started, remind me in detail of your current employment and how you came about finding yourself in this line of work.

Q: I understand that you had some experience in either the visual or performing arts while at the community college. Tell me more about that experience.

Q: When you were at the community college, what motivated you to enroll in any studies in the arts (visual or performing)?

Q: What kinds of things do you think may have changed about your life - personal or professional - due to your studies in the arts?

Q: Tell me more specifically about a time when something related to your arts experience seemed to guide your professional work.

Q: Tell me about how you think your studies in the arts may or may not have impacted your overall success in your professional work. Why do you feel this way?

Q: What else would you like to share about your career and any impact your arts training may have had?

APPENDIX
G: RESEARCH ASSISTANT CONFIDENTIALITY AGREEMENT

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

The Role of Creative Arts in STEM and other non-Arts Majors for Community College Students and Graduates

RESEARCH ASSISTANT CONFIDENTIALITY AGREEMENT

Introduction

Thank you for agreeing to assist in this research project. My name is Mara Jevera Fulmer and I am a professor and program coordinator in Graphic Design at Mott Community College. I am also a doctoral student from Ferris State University's Community College Leadership program. In the latter capacity, I am conducting a study on the role the creative arts may play for non-Art majors who have taken one or more visual or performing arts courses while attending a community college. The aims of this research are (a) to understand the relationship, if any, of prior college coursework in visual and/or performing arts on success in other fields of study; and (b) to explore how any prior coursework in the arts may have contributed to success in one's career development for STEM (Science, Technology, Engineering and Math) or other non-Arts majors.

Confidentiality: As an assistant in gathering data in this research, you agree to abide by this confidentiality agreement. Under no circumstances are you to share verbally, in writing, or by digital means, the data, names and identities of any participants without the written permission of myself, as primary researcher. Any material you collect as an assistant in this research is to be turned over to me, the primary researcher, immediately upon collection. No copies or backups are to be kept in your possession.

The form below confirms your agreement to these conditions.

This letter is yours to keep for future reference.

Statement of Confidentiality:

- *I agree to the terms of confidentiality outlined above and will abide by all methods of maintaining confidentiality for the data collection in this research as described above as well as any subsequent instructions from the primary researcher in writing.*
- *I agree not to disclose any of the data collected, or release any data that is gathered in this research that I may have been exposed to or assisted in gathering, without the written permission of the primary researcher, Mara J. Fulmer.*

Research Assistant Signature: _____

Date: _____

Research Assistant Printed Name: _____

Address: _____

Email: _____

Tel: _____

I, the undersigned, have fully explained the relevant details of this research study to the Research Assistant named above and believed that the Research Assistant has understood and has knowingly given their consent to abide by the terms of confidentiality for assisting in this research.

Printed Name: _____*MARA JEVERA FULMER*_____ *Date:* _____

Signature: _____ *Role in the Study:* ___*Investigator*_____

Mara Jevera Fulmer
810-813-0466 fulmerm@ferris.edu 5523 Jerome Lane, Grand Blanc, MI 48439

APPENDIX
H: IRB APPROVAL FORM

Ferris State University

Institutional Review Board (FSU - IRB)
Office of Academic Research
Ferris State University
1201 S. State Street-CSS 310 H
Big Rapids, MI 49307
(231) 591-2553
IRB@ferris.edu

To: Dr. Noreen Thomas and Mara Jevera Fulmer
From: Dr. Stephanie Thomson, IRB Chair
Re: IRB Application #140301 (Title: *An Examination of the Role of Creative Arts in Student Success in Non-Arts Fields*)
Date: May 8, 2014

The Ferris State University Institutional Review Board (IRB) has reviewed your application for using human subjects in the study, "*An Examination of the Role of Creative Arts in Student Success in Non-Arts Fields*" (#140301) and approved it as *expedited –category 2F/2G* from full committee review. This approval has an expiration date of one year from the date of this letter. **As such, you may collect data according to procedures in your application until May 8, 2015**. It is your obligation to inform the IRB of any changes in your research protocol that would substantially alter the methods and procedures reviewed and approved by the IRB in this application. Your application has been assigned a project number (#140301) which you should refer to in future communications involving the same research procedure.

We also wish to inform researchers that the IRB requires follow-up reports for all research protocols as mandated by Title 45 Code of Federal Regulations, Part 46 (45 CFR 46) for using human subjects in research. We will send a one-year reminder to complete the final report or note the continuation of this study. The final-report form is available on the IRB homepage. Thank you for your compliance with these guidelines and best wishes for a successful research endeavor. Please let us know if the IRB can be of any future assistance.

Regards,

Ferris State University Institutional Review Board
Office of Academic Research, Academic Affairs