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Growth mindset and fluency in the art classroom

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GROWTH MINDSET AND FLUENCY IN THE ART CLASSROOM

by

Heather Michele Seibel

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of the requirements for the Master of Arts
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CERTIFICATE OF APPROVAL

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MASTER'S THESIS

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This is to certify that the Master's thesis of

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To my children for their willingness to share their mother with her research.

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ABSTRACT

This research explores the relationship between mindsets and divergent thinking skills. Specifically, the research questions sought to answer whether there was a positive association between a higher presence of divergent thinking skills and a creative growth mindset, as well as the impact environment has on creative growth. A total of 184 second and sixth grade students from a larger urban school district were surveyed. Data collection included: student surveys, two divergent thinking assessments, direct observation of the students and teacher notes. Results indicate most students identify with a creative growth mindset, but are lacking specific strategies to demonstrate creative growth. In addition, reflective survey results revealed the impact environment can have in helping students recognize and apply the specific strategies and characteristics highly creative people possess.

PUBLIC ABSTRACT

Many of the traits associated with a growth mindset, such as curiosity, openness to experience, persistence, and willingness to take risks, are also traits linked with high levels of creativity. Students who believe their abilities can be improved are more likely to persist and take on new challenges. Understanding which classroom atmospheres and instructional strategies nurture these traits optimizes students' chances for creative growth.

The goal of this research was to investigate students' current beliefs regarding their creative ability. This information was then used to design instructional experiences and atmospheres that support student growth. Students in this study completed surveys and creative thinking challenges that were evaluated for creative growth. Overall, this research indicates the need to equip students with specific strategies to identify and overcome challenges they face in the creative process. Helping students recognize and nurture individual creative growth can increase student engagement and ultimately give students autonomy over their learning.

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INTRODUCTION

As an elementary art educator, there are two unspoken duties when hired – make the hallways beautiful and prove all students can be amazing artists. There is pressure to teach hang worthy lessons parents will delight over. Ironically, these are the same lessons I often spoon-feed to my students, bit by bit, step by step, a sure formula for success, eliminating much, if any, risk for failure. When I display artwork, it is these lessons I receive the most positive feedback on from other adults.

"Draw this here, paint that there, mix these colors…" It becomes an intricate dance led by an expert instructor, often with beautiful, frame-worthy results. However, when the music fades, I cannot help but wonder – who will take the lead? Are these same, wonderful works of art, that are praised for their frame-ability, the same ones that also cripple a student's ability to imagine, play, explore… even fail? Does a method that focuses so intently on product and outcome truly teach our students the importance of process and growth – which is integral to all learning? Or does it create a classroom of students codependent on their teacher's judgment and decision making, seeking constant affirmation their work is good?

The importance of independent judgment is one trait identified in creativity development (Gardner, 1982). Other characteristics linked with creativity include problem finding (Dewey, 1920; Wallas, 1926; Csikszentmihalyi, 2014), openness to experience (Starko, 2005), risk taking (Gruber, 1988; MacKinnon, 1978), persistence (Weisburg, 1986; Hetland, Winner, Veenema, & Sheridan, 2013), and curiosity (Starko, 2005). Divergent thinking, another quality associated with higher creativity levels, is the ability to think of many possible outcomes to a given problem or question (Guilford, 1986). Within divergent thinking exist the components of fluency, flexibility, originality and elaboration. Dr. E. Paul Torrance (1990) used these components in the

development of the Torrance Tests of Creative Thinking (TTCT). Although these tests, which measure both verbal and figural creativity, have been widely used as a form of assessment, Torrance intended the TTCT to be a starting point for planning differentiated instruction, thereby nurturing continual creative growth.

This research led me to question the role of environment in creative development. In several interviews done by Starko (2005) of elementary and middle school aged students, children were asked what they would choose to learn about if given a choice. Younger students were eager and quick to respond with a variety of curiosities and problems they would like to explore. Older students were stumped and "could think of no interests, questions, or problems that intrigued them" (p. 118). Starko argues, this is, in part, due to the influence of a school environment that not only tells students what they will be learning, but also the questions they must ask.

When I first began teaching, I witnessed this same phenomenon in my own classroom. I gave sixth grade students complete freedom to choose what they wished to create for their clay project. Knowing students had previously learned a variety of clay hand-building techniques, I imagined this freedom of choice would enable a perfect marriage of skill and individual creativity. Never before have I been so disappointed or frustrated with the results. Several students formed undecipherable lumps of clay that would surely explode once fired, while others reverted back to the simplest forms of pinch pots and flattened slabs embellished with smiley faces. The evidence of creative expression or divergent thinking was highly absent. What went wrong?

Much creativity research identifies choice is an essential component for nourishing creativity (Kohn, 1993; Starko, 2005). Yet my students responded with anxiety and dismay, staring at their lump of clay like deer caught in the headlights of an oncoming car. Despite being

told in advance the criteria and given time to plan their course of action, most students were unprepared and unable to think creatively independently. Indeed, while examining changes in the TTCT Figural scores from 1966 to 2008, Kim (2011) found a decrease in creative thinking scores beginning in 1990, despite increases in overall IQ scores. The greatest slumps in creativity were noted as students entered sixth grade. She attributes this in part due to the development of logical thinking but also cites concerns that home and school environments allow students little time for free exploration and play, a natural outlet to build curiosity. This curiosity, in turn, leads to problem finding, "a starting point for creative products" (p. 293). She argues, like Starko, home and school environments "provide students with problems to solve" (p. 293) rather than teaching them necessary problem finding skills.

Likewise, in biographical studies written by Csikszentmihalyi (2014) of highly creative individuals, schools were rarely mentioned as a source of inspiration in the individual's creative development. Most individuals experienced some sort of deep curiosity, followed by play and experimentation. The role of adults and environment varied, but, when mentioned, teachers showed interest and belief in the student's ability and provided a nurturing, challenging environment for the ability to grow.

As a teacher, this idea of growth intrigues me. Through her research, psychologist Carol Dweck (2006) classifies two mindsets: fixed and growth. Many of the traits associated with a growth mindset, such as curiosity, openness to experience, persistence, and willingness to take risks, are also traits correlated with high levels of creativity. I have noticed a decline in my students' willingness and/or creativity between second grade and sixth grade. Many students begin to believe they are simply not good at art or not a creative person. This led me to question whether I model a growth or fixed mindset in my own classroom practices and what impact this may have on my students' belief in their creative ability.

<u>Purpose and Research Questions</u>

The purpose of this research is to examine how students' mindsets about their creative ability influence their art making process and divergent thinking skills. Specifically, I seek to answer the following questions:

1. Is there a positive association between high fluency levels in art and a growth mindset?

2. If this positive association does exist, what strategies can be implemented within an art classroom to promote a creative growth mindset and improve overall divergent thinking skills?

To answer these questions about fluency and growth mindset, I conducted a study with second and sixth grade students at Riverdale Heights elementary in Bettendorf, Iowa, during the 2016 school year. Both grade levels consist of four class sections each containing 22-24 students, totaling 174 participants in all. The students receive art education from a certified art instructor for 40 minutes every four days. During art class, students completed a creative growth mindset survey, questionnaires and two art challenges. These activities were linked within an abstract art unit. Teacher feedback strategies within the art classroom were also implemented to promote a growth mindset atmosphere.

In the next section, I review the literature on characteristics associated with highly creative people. Specifically, I will discuss the creative components associated with the TTCT and divergent thinking. Next, I will examine the traits linked with a fixed mindset and a growth mindset. Finally, the role of environment and feedback in the development of a creative growth mindset will be discussed. Following the literature review, the methodology will be described. After the methodology section, the results will be presented, followed by the discussion section and implications.

LITERATURE REVIEW

In the literature review, I examine research on the topic of creativity, growth mindset and the role teacher and classroom environment has on the two. This review is separated into three sections: creativity, growth mindset and creativity, and creative growth mindset in the art room. The first section is divided into three sub-sections: definitions of creativity, creative characteristics, and creative assessments. I begin by looking carefully at what researchers believe it means to be creative. I then identify traits associated with creative individuals. In addition, I focus on the creative components associated with divergent thinking and the TTCT figural assessment. The second section is divided into two sub-sections: growth mindset, and creative growth mindset. I will review Carol Dweck's growth mindset research and its implications for the classroom before analyzing how this might impact creativity. In the final major section there are two sub-sections: role of environment and role of feedback. This section focuses on environmental qualities conducive to creativity development and the impact interactions with students can have in the nurturing of a creative growth mindset.

Creativity

The ability to think creatively is essential to human existence. At our very core, we have a strong need to define and express ourselves. It is through creative thought that we are able to find and solve problems, invent, dream and discover. These capabilities allow us to explore our world in wonder, full of curiosity, questioning the peculiarities that surround us. It is this thinking that leads to innovation and progress, but where does this creativity begin? How does it manifest itself? Before we can begin to ask these questions, we must first understand what it means to be creative.

Definitions of Creativity

Early research defines the creative process in terms of problem finding and solving (Dewey, 1920). The Wallas stage model (1926) built upon Dewey's early model, adding an *incubation* period in which the individual unconsciously ponders potential solutions to the perceived problem. Similarly, Torrance (1990) formed his research around specific stages in the creative process. Like earlier researchers, the first three stages involve problem finding followed by the testing and evaluation of ideas. However, the proposal of sharing outcomes was introduced as a fourth stage, touching upon the idea creativity should somehow impact the greater good. Runco (2014) also supports this belief, stating "creative things are always original" (p. 393), but they must also be useful. Furthermore, he adds to this definition, arguing creativity is dependent "on personal interpretations of experience" (p. 394).

In contrast, Maslow (1968) emphasized the role of a psychologically safe environment in the manifestation of one's individual creativity. While Maslow agreed some creativity was the result of creative genius, or Big C creativity, he also argued for the existence of creativity in everyday life. In fact, Maslow believed all people were born inherently creative, but in time, much creativity "is lost or buried or inhibited" (p. 143). Likewise, the role of environment is important in Roger's (1961) theory of creativity. Interactions between the individual and their environment influence creativity which then results in innovative products.

Equally important, Vygotsky's (as cited in Starko, 2005) studies examined how both creative children and adults interact with their environments. He thought children's creativity was more spontaneous and the result of play. Whereas, creative adults act consciously in their area of expertise with the intention of making an impact on their environment. Underlying both of these theories is the idea creativity does not stand alone, rather "emerges through interactions with other individuals" (Starko, 2005, p. 60).

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In support of this, the systems theorists, such as Csikszentmihalyi (2014), stress people do not create in a vacuum. On the contrary, an act cannot be considered creative unless the field, or those people who have influence within that creator's domain, accepts the act as creative. A domain is a subject or area in which the creator has developed expertise. Expanding further on Csikszentmihalyi's research, Gardner (1982) rejected the notion of creativity as a general characteristic of a person, declaring creativity to be domain-specific. Despite the varying beliefs regarding creativity, two themes consistently emerge. For an act to be creative it must be novel and it must be appropriate (Starko, 2005).

The majority of creativity research has been undertaken with adults who have had major impacts on their societies, or Big-C creativity. As an elementary art educator, I am more interested in little-c creativity and the eventual impact it could have in the development of Big-C creativity. For the purpose of this research, I will reference Starko's (2005) definition of creativity as follows:

> If students successfully communicate an idea or endeavor to solve a problem, their efforts can be considered appropriate. If they do so in a way that is original, at least to them, we can consider the efforts creative (p. 7).

Creative Characteristics

Qualities linked with creativity through research are numerous, and to list all characteristics here would be quite lengthy. I will touch briefly upon commonly researched traits, such as problem finding, openness to experience, independence of judgment, risk-taking, and persistence, before focusing more intently upon those associated with divergent thinking.

As previously mentioned, early creativity research was driven by the process of problem finding (Csikszentmihalyi, 2014; Dewey, 1920; Gardner, 1982; Wallas, 1926). For the creative process to exist, a person must first be aware of a perceived problem they wish to remedy. Often this problem is identified through play and a willingness to be open to new experiences (MacKinnon, 1978; Rogers, 1961; Starko, 2005). This trait "implies that an individual is willing to view experiences outside of traditional categories, to consider new ideas, and to tolerate ambiguity if ambiguity exists" (Starko, 2005, p. 58). Indeed, they are not afraid to "play with ideas … and to generate wild hypotheses" (p. 58). This ability to play and experience the unfamiliar allows the human brain to make new connections, and escape entrenchment.

Creative individuals are also portrayed as actively persistent and willing to take risks (Gruber, 1988; MacKinnon, 1978). Moreover, they continually seek out new challenges and questions, even as one comes to an end. Weisburg (1986) believed creativity could be increased through persistence. In fact, Big-C creativity does not happen in a moment, but rather is the product of years of experience, learning and even failure. Gardner (1982) also noted these traits in highly creative people. Risk taking creates the potential for criticism and ridicule. Not only is a highly creative person willing to take risks, but they recognize and accept the risk might end in failure. Often they will pursue their goal even if its achievement comes at great cost personally or professionally.

With this in mind, creative people must exhibit independence of judgment (MacKinnon, 1978; Runco, 2014; Starko, 2005). This includes being an independent thinker as well as having the ability to analyze creations with specific individual standards. They understand "that judgment is based on criteria, not whim" (Starko, 2005, p. 108) and are able to classify good ideas from bad ones. If students are not given the opportunity to develop independent judgments, they are at risk of being needy and dependent solely on their teacher's judgment. As referenced

earlier in Starko's research, this could be one contributing factor to older students' lack of curiosity and questions when presented with choice in the learning process.

As previously defined by Guilford's (1986) Structure of Intellect (SOI) model, divergent thinking is the ability to think of many possible outcomes to a given problem or question. Many strategies designed to improve creative thinking target this characteristic of creativity. In MacKinnon's (1978) research, divergent thinking strategies were linked with more creative outputs. Within divergent thinking are four sub-categories: fluency, flexibility, originality and elaboration.

Fluency is the ability to generate multiple outcomes or ideas (Guilford, 1986). While being fluent does not guarantee all produced ideas will be creative, it stands to reason with more options there is a greater likelihood for creative possibilities (Starko, 2005). In one study, MacKinnon (1978) found while some individuals could list many ideas, they were not always original. Interestingly, some of the most original ideas came from individuals who only had a few listed. Furthermore, Runco (2014) cautions that the purpose of a fluency activity should be clearly defined or there is a risk the ideas generated will lack purpose.

The second component of divergent thinking is flexibility, or the ability to generate diverse ideas (Guilford, 1986). Flexible people can "look at a situation from many points of view" (Starko, 2005, p. 106). Fluency, without flexibility, is likely to lack quality ideas. Although this may be true, it is not enough to be flexible in one's thought process. The individual must also be able to use independence of judgment to apply specific criteria in the selection process as they narrow their options.

The third component, originality, is the ability to generate unique ideas (Guilford, 1986). Creative individuals who show strong fluency and flexibility are likely to produce more original ideas. In one problem finding study, Csikszentmihalyi (2014) found a strong correlation between

problem finding and originality. College students were given still life materials and asked to create potential still life problems. One factor recorded by researchers was the uniqueness of the objects used and how those objects contributed to the overall originality of the composition.

The final component of divergent thinking is elaboration, or the ability to improve or expand upon an idea (Guilford, 1986). Like flexibility, this trait also involves the use of independent judgment. During the examination of previously conceived ideas, it is important to be able to identify any weaknesses or flaws so they can be revised or improved. When using divergent thinking strategies in a classroom, fluency, flexibility, originality and elaboration "can provide valuable tools as long as students understand the situations in which the tools are useful" (Starko, 2005, p. 191).

Creative Assessment

Many strategies have been devised to increase creative thinking, but the only method to know if these strategies are truly successful is to develop an instrument to measure creativity. Before choosing an assessment method, the general purpose of the assessment needs to be considered. Starko (2005) identifies six purposes for assessing creativity:

1. Helping to recognize and support the strengths of individuals as well as helping individuals to recognize their own strengths.

2. Expanding our understanding of human abilities.

3. Providing baseline data that may be used to diagnose student needs and plan instruction.

4. Evaluating efforts to enhance creativity.

5. Providing common language for professionals wishing to discuss various aspects of creativity.

6. Removing the concept of creativity from "the realm of mystery and superstition" (pp. 421-422).

Obviously not all of these assessment purposes are necessary for every situation. For the purpose of my research, I will consider the function most appropriate for a school setting. Primarily, I will focus on assessments to help students recognize and expand upon their personal strengths and for the use of planning future lessons that meet individual students' needs.

One of the most widely used assessments in creativity research has been the Torrance Tests of Creative Thinking (TTCT; Torrance, 1990). Certainly, when developing the TTCT, Torrance had to decide both the purpose for his assessment and what specific area of creativity he wished to assess. His "main focus was in understanding and nurturing qualities that help people express their creativity" (Kim, 2006, p. 4). The resulting TTCT was designed to measure both verbal and figural creativity by examining specifically the characteristics associated with divergent thinking. Each of these tests present the test taker with a series of open ended tasks from creating lists to completing pictures. Ten minutes are allowed for the completion of each task. Torrance recommended the tests be presented as a fun challenge or in a game-like atmosphere.

For scoring purposes, fluency, flexibility, originality and elaboration are measured. For example, fluency is simply the number of ideas or drawings completed while flexibility is scored by calculating the number of categories from the total ideas represented. The TTCT has been renormed four times (Kim, 2006). As a result, the category of flexibility was eliminated and the categories of abstractness of titles and resistance to premature closure were added. When scored professionally, this test has shown good reliability or agreement between scores given for the various categories.

Despite the wide use of the TTCT in schools and by researchers, Torrance (1990) did not mean for the TTCT to be the only measure of creativity. Nor did he believe scoring well on the TTCT automatically guaranteed high creativity in adulthood. In fact, at least two assessments are recommended in the measurement of creativity (Kim, 2006). When used with the right intention, "the TTCT provides a physical measure and groundwork for the idea that creative levels can be scaled and then increased through practice" (p. 11). Indeed, Torrance intended the TTCT to be a starting point for planning differentiated instruction, thereby nurturing continual creative growth.

<div align="center">Growth Mindset and Creativity</div>

As previously discussed, a common characteristic researchers associate with creativity is persistence (Gardner, 1982; Gruber, 1988; MacKinnon, 1978; Weisburg, 1986). Persistence in creativity leads individuals to ask questions, seek new challenges, push past failures and ultimately grow in their creative strengths. However, these actions suggest more is in play than simply a character trait. Rather, one might question the very mindset of such intensely motivated individuals.

Growth Mindset

Carol Dweck (2006), a professor of psychology at Stanford University, has spent much of her career examining mindsets, specifically within an educational setting. Her discoveries have led her to identify two mindsets: fixed and growth. While people with a fixed mindset "see strengths and skills as innate traits" (Dweck, 2016, p. 6), people with a growth mindset believe their brain can continually improve and grow through both effort and failure. This "ability of the brain to change, adapt, and 'rewire' itself" (Ricci, 2013, p. 5) is neuroplasticity. Both mindsets come with "rules" (Dweck, 2007). For the fixed mindset, mistakes are equivalent to lack of

ability; hard work or effort equals low intelligence; and mistakes aren't repairable. On the contrary, for a growth mindset, effort increases ability; challenging tasks stretch abilities; and deficiencies can be improved by implementing new strategies.

As can be imagined, a fixed mindset does not provide a student with much room for growth. Either one is good at something or smart in a subject or they are not. Through her research, Dweck (2007) found when she presented students with a choice between easier tasks and more challenging tasks, the students who held a fixed mindset were more likely to choose the easy task. She believes this is because students with this mindset feel "an urgency to prove themselves over and over" (Dweck, 2006, p. 6). The danger to this behavior is that students will only seek tasks that prove how intelligent they are while avoiding any task that might end in failure.

In contrast, those who identified with a growth mindset, when presented the same tasks, progressively chose harder and harder tasks to do. People with a growth mindset believe the full extent of their abilities is unknown and can be improved through effort and persistence (Dweck, 2006). For them, failure is a good thing – it becomes a method for identifying weak areas and developing strategies to overcome them. This mindset firmly believes intelligence is malleable (Ricci, 2013). Therefore, the focus is placed on learning. Similar to a highly creative person, someone who identifies with a growth mindset believes they will eventually reach their goals by being persistent.

Creative Growth Mindset

Jackson Pollock was an artist who had persistence. He decided early in his life that he wanted to be an artist; however he had very little natural ability (Landau, 2010). Despite this, Pollock continually surrounded himself with art, creating every chance he had. He was able to

learn from other artists, such as Thomas Hart Bentley and Mexican muralist David Siqueiros, learning new strategies and building his skill. After years of effort and persistence, he finally began to master his domain and create truly original non-objective paintings. Did Pollock have a growth mindset as Dweck describes above or was he a creative individual? Is it possible he was actually a mix of both?

In support of this, Karwowski (2014) tested the theory of a creative mindset. In agreement with Dweck's (2006) descriptions of fixed and growth mindsets, a creative mindset is defined "as beliefs about the stable-versus-malleable character and nature of creativity" (p. 62). While much research has been done to answer what creativity is and how it presents itself (Csikszentmihalyi, 2014; Gardner, 1982; Guilford, 1986; MacKinnon, 1978; Starko, 2005; Torrance, 1990), very little has been produced regarding the mindsets creative people embrace.

Through his research, Karwowski (2014) found people often held both fixed and growth mindsets regarding creativity. For instance, they may believe they have fixed creative abilities in terms of Big-C potential, but can continually grow their little-c creativity. He found people who believed their creativity could be improved through effort "perceive themselves as more creative" (p. 66). Karwowski's results also indicate stronger creative problem solving skills are correlated with creative growth mindsets. This is attributed to higher levels of engagement and persistence. In effect, a fixed creative mindset may rationalize why a difficult creative task is not worth the effort.

While many creativity researchers have not explicitly investigated this theory, several theorists' work correlates with these findings. For example, Perkins (1981) emphasized the key to creativity was to be purposeful. In other words, creative people intentionally choose creative activities and consistently strive to be creative. Likewise, Weisburg (1986) cited two methods for increasing creativity: commitment and persistence. Comparatively, Gardner's (1982) concept of

fruitful asynchrony highlights the notion that while highly creative people often face adversity within their field, they thrive on these challenges instead of admitting defeat. In fact, highly creative people know there is a risk of failure. Yet they accept that risk and persist. This perseverance is incredibly important in the creative process. Despite failure, creative individuals are able to "continue in the face of obstacles, to maintain motivation without immediate reward, and to stay focused on a task for long periods" (Starko, 2005, p. 116).

This description of the creative effort is very similar to Dweck's (2006) definition of a growth mindset and agrees with Karwowski's (2014) findings. Indeed, when comparing current methods used to promote a creative atmosphere in the art room, such as studio habits of the mind (SHoM; Hetland et al., 2013), or Getting's (2016) artistic design aesthetics, overall concepts align with a creative growth mindset and teach students strategies to improve their creativity. Most notably, both methods have elements that encourage students to "envision" possible outcomes, "stretch and explore" beyond their current abilities, learn from mistakes, and reflect on technique and progress. The overarching philosophy for both of these methods is to help students recognize and grow in their creative thinking capabilities.

<div align="center">Creative Growth Mindset in the Art Room</div>

The SHoM (Hetland et al., 2013) are attractive to art educators because they provide a clear framework for nurturing continual creative growth and developing autonomous learners. When implemented purposefully, they are clear-cut tools students can use to get from point A to point B, thereby increasing students' creative abilities. However, whether one is implementing Dweck's (2006) growth mindset strategies or the SHoM, the impact environment and feedback can have on creativity must also be considered.

Role of Environment

Both Maslow (1968) and Rogers (1961) believed creativity is the by-product of psychological well-being. The interaction between environment and individual plays a vital role in an individual's ability to take risks and freely express themselves. Vygotsky (as cited in Starko, 2005) mirrored this view, portraying the creative person as "a plant growing in a certain time and environment" (p. 60). Similarly, Weisburg (1986) hypothesized that immersion in a specific field was essential for creative growth. He further claimed that if everyone had access to the knowledge and environment of that specific creator, they may too begin to understand how that creativity manifested. Furthermore, Csikszentmihalyi (2014) considered the role of the specific field in creative development. Not only does the field judge and assign value to the creative endeavor, but they also provide valuable mentors that can suppress or nurture creative growth.

Unfortunately, the traits often associated with creative growth, such as willingness to take risks and independence of judgment, are often viewed in a negative light in the classroom atmosphere (Csikszentmihalyi, 2014; Kim, 2008; Ricci, 2013). In her study of creative underachievers, Kim found potentially up to 30 percent of high school dropouts may be gifted students. These students "exhibited independence of thought and judgment, willingness to take risks, perseverance, above-average ability, creative ability, and an intense love for what they were doing" (p. 235). However, these same students often ask challenging questions, resist conformity and authority, and may not fit in with their peers due to these creative behaviors.

In contrast, teachers described their model student as exhibiting "unquestioning acceptance of authority, conformity, logical thinking, and responsibility" (Kim, 2008, p. 237). Reinforcing these behaviors, and punishing the creative ones, may completely discourage creative behavior. In fact, by suppressing creative behavior, we risk creating students who are "likely to

grow up with a lack of confidence in their own thinking and be overly dependent upon others in making decisions" (p. 238). These findings support the lack of interests, problems and questions Starko (2005) encountered when she gave older students choice in their learning.

In the same fashion, a study done by Aljughaiman and Mowrer-Reynolds (2005) asked teachers to describe and rank creative qualities in their students. Teachers confused creative characteristics with those of gifted high achievers, eliminating students with lower achievement levels as being creative, and important traits like problem finding and divergent thinking were completely absent on their lists. Even more concerning, teachers only listed likeable traits as being associated with creativity. Other traits, such as independent judgment, were listed as misbehaviors. Furthermore, they believed the "majority of regular classroom teachers were not responsible for helping students develop their creativity" (p. 13). Kim (2008) argues against this, stating both creativity and intelligence are needed for success in the sciences and arts.

To counteract these classroom atmospheres that stifle creative growth and potentially lead to creative underachievers, Kim (2008) recommends school settings be less restrictive. She suggests hands-on, challenging tasks that allow students to move and be active participants in their own learning. When possible, parents and teachers can support children by allowing them to pursue areas of interest. Likewise, students should be encouraged to self-evaluate and take internal pride in their work. Kim also stresses the role of teacher as mentor both in and out of the classroom. It is vital teachers encourage varying views, and model creative behaviors themselves. "A creative adult can help the highly creative student navigate the bridge between autonomy and conformity" (p. 240).

Other researchers are in agreement with these methods (Dweck, 2006; Esquivel, 1995; Ricci, 2013). Researchers found teachers who value individual student growth and whose classroom atmosphere is more "flexible and democratic", produce students who are more creative

(Esquivel, 1995). Ricci (2013) also emphasizes the importance of setting high expectations, while slowing down the overall pace content is covered in, to allow for individual effort and persistence. Finally, Dweck (2006) believes in building a whole school culture focused on growth. By helping students identify strategies that meet their needs, teachers allow students to go beyond effort and build autonomy in learning.

Role of Feedback

In one interesting study, Ricci (2013) observed elementary aged students for growth mindset qualities. Kindergarten students entered the school year excited, believing they could learn anything. Indeed, she found no evidence of a fixed mindset present. By third grade an alarming 42% of students demonstrated a fixed mindset. Certainly this could be due to many of the environmental factors previously discussed, but one important tool teachers use daily to help students monitor their learning is feedback. Effective feedback places the focus on learning, not intelligence, and helps students recognize the effort and persistence necessary for growth (Dweck, 2006).

Praise is one type of feedback commonly employed by educators. Many teachers use praise to build a student's confidence and motivation to learn (Dweck, 2007). In a study of preschool students, the effects of generic and nongeneric praise were evaluated (Cimpian, Arce, Markman, & Dweck, 2007). Researchers gave students generic praise that focused on character traits and more specific praise that focused on action or process. The results showed preschoolers who were praised generically displayed helplessness when they encountered a mistake or were presented with increasingly challenging tasks.

Dweck's (2007) research found similar results. Surprisingly, students who were praised for their intelligence later lied about how well they scored on the more challenging tasks. They

equated failure with lack of intelligence. While praising intelligence or ability might raise a student's self-esteem temporarily, the long term impact has been correlated with students adopting a fixed mindset. It may send the message to students that the teacher is judging their overall intelligence or ability and that their value as a student in the classroom is dependent on success. For praise to be helpful for students, it must be specific to "their effort, strategies, concentration, choices, and persistence" (p. 9).

Other forms of feedback could include clear standards or criteria by which the student can measure their progress (Masters, 2013; Runco, 2014; Starko, 2005). By giving students an "internal locus of evaluation" (Csikszentmihalyi, 2014), students spend more time focusing on the learning process and less time trying to prove their creativity or intelligence. Students should also be allowed to interact and provide feedback to each other. In his study of highly creatively adults, Csiksentmihalyi identified a social aspect to creativity. As previously discussed, creative growth does not happen in a vacuum, but is dependent on interaction between mentors and peers within the field. Ultimately, these types of feedback allow students to take ownership over their learning and teachers to assume the role of facilitator instead of ultimate judge.

SUMMARY

In the literature review, I first described theories of creativity and sought to define what it means to be creative. Early theories, including Dewey's (1920) problem solving model and the Wallas (1926) Stage Model, had foundations in problem finding. Other creative theories emphasized the role psychological safety has in creative development (Maslow, 1968), how interactions between individual and environment impact creativity (Csikszentmihalyi, 2014; Rogers, 1961), the differences in how children and adults experience creativity (Vygotsky, 1930, cited in Starko, 2005) and the idea that creativity can be domain specific (Gardner, 1982).

I then defined specific characteristics associated with creativity. These traits included problem finding (Csikszentmihalyi, 2014; Dewey, 1920; Gardner, 1982; Wallas, 1926), openness to experience (MacKinnon, 1978; Rogers, 1961; Vygotsky, 1930, cited in Starko, 2005), persistence and willingness to take risks (MacKinnon, 1978; Weisburg, 1986), independence of judgment (Runco, 2014; Starko, 2005), and divergent thinking (Guilford, 1986; Torrance, 1990). Torrance's research emphasized the importance of divergent thinking skills in the problem finding process. These creative thinking skills, which include fluency, flexibility, originality and elaboration, are important in an educational setting because they teach students to brainstorm many possible ideas, from a variety of views, before choosing and elaborating on their more original concepts. As Starko (2005) has found through her research, older students struggle to identify problems they would like to investigate. With so much emphasis on testing, it is important students learn to think for themselves and understand that, in many cases, there is more than one correct answer to a perceived problem.

As a result of his studies, Torrance (1990) created the TTCT to assess divergent thinking. While these tests have been widely used to identify gifted students, Torrance recommended at

least two creativity assessments be used. Torrance's purposes for the assessments were not exclusion, but rather to understand and nurture creative qualities in individuals.

The second section in the literature review examined growth mindsets and creative growth mindsets. Specifically, the research of Dweck (2006; 2007) demonstrated that students who believe their abilities can be improved are more likely to persist and take on challenge. Equally important, Karwowski's (2014) study correlated stronger problem solving skills with a creative growth mindset. Certainly, educators need to be aware of the beliefs students hold regarding their abilities and the impact these beliefs can have on learning. They will need to examine what learning environment they provide for students and how they can guide students to place the focus on learning and growth.

The final section of the literature review questioned the role environment and feedback has on creative growth. Many researchers have demonstrated optimal creative growth is dependent on environment (Maslow, 1968; Rogers, 1961; Weisburg, 1986). Specifically, Csikszentmihalyi (2014) emphasized that creative individuals are immersed in a domain-specific field that can either suppress or nurture growth. As part of this field for students, teachers have a duty to mentor and help students grow. On the other hand, Kim's (2008) study of gifted underachievers cautions that many of the traits needed for creative growth are not considered desirable in classrooms. Educators will need to devise strategies that allow students to express creative traits in appropriate and safe ways.

Similarly, feedback plays an important role in helping students grow and build autonomy. Dweck (2007) warned against the use of generic, whole person praise when giving feedback. This resulted in students adopting a fixed mindset towards learning. Her study is significant for educators of all areas because it highlights the importance of recognizing students' specific efforts and strategies in the learning process. Feedback can take many forms, including self-

evaluating criteria and peer collaboration (Csikszentmihalyi, 2014). With specific purpose, feedback can allow students to take ownership of their learning process.

The purpose of this study was to examine how students' mindsets regarding their creative ability influence their art making process and divergent thinking skills. I also sought to explore what environmental and instructional factors are optimal for nurturing a growth mindset. While there is much literature regarding growth mindset, research is limited on the study of creative growth mindset. This research will aid art educators and other content areas seeking to understand and improve creative growth. This information can be used to design instructional experiences and atmospheres that support student growth. Helping students recognize and nurture individual creative growth can increase student engagement and give students autonomy over their learning.

METHODOLOGY

Design

I used both qualitative and quantitative methods in my research design. I felt this would allow an in-depth look at connections between fluency and a creative mindset. Data was collected through observation, student surveys and daily art warm-ups. Students completed a survey to measure initial starting mindset. I collected data by observing students' art making process during their daily warm-ups. Students were required to complete daily warm-ups at the beginning of each art class. Student fluency, flexibility and originality were measured from daily warm-ups with a rating scale. Additionally, I examined student surveys for common themes in mindset.

Sample

Setting

My observations took place over a five week period during the regularly scheduled second and sixth grade art class periods at Riverdale Heights Elementary. This is one of five elementary schools in the Pleasant Valley School District. The observations occurred over a five week period during August and September 2016. Students attended art class once every four school days for forty minutes as part of their regular art program. Over the course of four weeks this equated to five class periods within an abstract art unit.

I am the primary art educator for the Riverdale Heights Elementary. All students, kindergarten through sixth grade, receive 40 minutes of art every four days. The elementary art program is well-funded by the school district. This allows for a quality space to create with appropriate materials for the students. The curriculum is aligned to the state and national

standards with emphasis on visual culture and finding stories within art (Keifer-Boyd &

Maitland-Gholson, 2010).

Sample Characteristics and Size

The sample population consisted of second and sixth grade students at Riverdale Heights

Elementary. In the second grade there were 84 students total who participated in this unit. The

sixth grade population consisted of 90 students. Each grade level is separated into four classes

between 22-24 students each. Of the 174 participants, 84 are female and 90 are male. For the

purpose of this study, I am considering the participants as a whole and looking at generalized

commonalities and differences. No student identities will be revealed.

Generalizability

This sample may be generalized to elementary aged students aged between 8 and 12 with

varying levels of artistic ability. The elementary is in an urban setting and part of a school district

that ranks among the top ten districts in the state of Iowa. Students primarily come from middle-

class homes. According to district student survey responses, 91% of students believe the schools

challenge them to do their best work, and 88% believe their teachers will help them if needed

(Annual Progress Report, 2016). Art is required for all students in the elementary schools. The

majority of students appear to be motivated and excited in art class.

One limitation of the sample is that the racial composition of students is primarily White.

For Riverdale Heights Elementary, 25% of the student population is Asian, Hispanic, African

American or Native American. While research does not distinguish divergent thinking or mindset

based on racial factors, differing cultural norms could impact the way creativity itself is

experienced and expressed (Starko, 2005).

Data Collection Procedure

Prior to beginning the study, I spoke with the administrator of my building to obtain permission to conduct a study during my class. This was a minimal risk study as all students were participating in a normally occurring unit within their regular art curriculum. The human subjects research approval (IRB) board granted exempt status with two conditions: student identity was kept anonymous, and student guardians were informed of the purpose of the study while given the option to exclude their child's data if desired. This information was collected by a third party who then organized the data so student participation would remain anonymous. Data was also aggregated to further protect children's identities.

Students currently partake in daily sketchbook work to promote creativity and fluency. They also answer reflective survey questionnaires at the beginning and end of each unit that tie into common themes or art work being discussed. These are learning activities currently in use within the art room. The main difference was in how the results of these labors were analyzed. Instead of looking at individual student's growth, I compared overall group percentages searching for common threads between growth mindsets and fluency. For the purposes of this research, a third party collected student surveys and warm-up activities at the completion of each task so participant's work could be sorted out, analyzed and the data aggregated. I was then able to access the aggregated data to look for themes.

Prior to starting the abstract art unit for second and sixth grade, I monitored my own responses to student questions and art work for one week, tallying how often I gave fixed mindset feedback compared to growth feedback. I also tallied how often students sought validation from me by asking, "Is this good?" This served as my initial data to evaluate my current practices towards building a classroom focused on growth. Throughout the abstract art unit, I implemented strategies within my own teaching to help promote a growth mindset classroom using language

that specifically addressed and recognized effort and growth versus using simple words of praise. Class discussion regarding artists and the students' work was also framed to focus on how growth was occurring through persistence and effort.

Four classes of each grade level completed an Art Mindset Survey and initial fluency warm-up activity lasting ten minutes prior to the introduction of the abstract art unit. This warm-up activity was inspired by the TTCT (Torrance, 1990) and asked students to complete a series of abstract lines. This unit takes roughly five classes to complete with the focus on the elements of line, shape and color. After completing the survey, each class examined abstract art work while discussing the questions of, "What is art?", and "Who can make art?"

The second warm-up activity consisted of a color mixing challenge. Torrance (1990) recommended presenting divergent thinking assessments as a challenge or game-like activity. Students were told they were color scientists and it was their job to invent as many color formulas as possible. They were given the primary colors, plus black and white. This activity is used to build students' color theory before they begin painting their actual abstract art creation for the art unit. Due to the nature of painting materials this activity spanned a class period. At the start of the next class, students shared insights into their strategies for devising new colors, what went well and what color mixtures failed in their opinion. The idea that failure is a normal part of the artistic process, and can be a useful tool to learn from, is not something we had specifically discussed in prior art classes. Students then applied their new color theories to their abstract art projects, creating layers of colors, lines and shapes, to create an interesting composition they thought would meet the criteria of abstract art.

The fourth portion of the unit revisited abstract artists and each class discussed challenges artists faced within their art work. The students focused on the failures, effort and learning process of each artist while taking the focus off the idea of being born an artist. Students also

contemplated activities outside of art that they show evidence of persistence in. Many biographies written for children serve as models of good character instead of portraying the real-life struggles and failures the individual may have faced. These portrayals can be damaging to a student's mindset if it leads them to believe success is easily attained and not something a person must work hard for (Starko, 2005). Likewise, Dweck (2007) emphasized the importance of helping students understand effort does not equate with a lack of ability.

The final class of the abstract art unit students completed their art work using markers, oil pastels, paint or other medium they felt would best emphasize their abstract design. They were given freedom to matte and title their artwork in a way they thought would best present the piece of art. Students were given a final reflective survey asking what makes someone a great artist and asked to give advice to someone who might be struggling with their art. At the end of the unit students could look back through their abstract art work for evidence of personal learning and growth before setting goals for their next project.

<div align="center">Measures</div>

For one week prior to the start of the study, I kept simple tally marks based on how I responded to student art work. Whenever I gave generic feedback, I marked a tally under *Fixed*. Whenever I responded to students' work with a comment that was specific and recognized student effort or process, I marked a tally under *Growth*. Initially, this was easy to do, but as the week progressed I became increasingly aware of how I was responding to students' work. To ensure reliability, I marked a tally at this point based on what my instinct was to say at that moment, even if I was able to stop myself before I gave generic praise.

The other initial data I tracked measured student autonomy. I was curious to see if students asked me questions related to process and growth or if they were seeking my validation

as an authority of art. Every time a student asked me, "Is this good?", or anything related to that concept, I marked a tally under *Validation*. For each growth or process related question I also kept tallies under *Process.*

To gain insight into students' beliefs about their creative ability, I devised a creative growth mindset survey made up of four questions. I adapted this survey from Dweck's (2006) growth mindset survey in *Mindset: The New Psychology of Success*. Four questions were used instead of one basic question to see if students identified completely with a creative growth or creative fixed mindset or held a mixture of both mindsets. Students could choose to agree or disagree with each statement on the survey. Questions 1 and 2 specifically identified fixed mindset qualities while questions 3 and 4 aligned with growth characteristics (see Table 1). Due to varying reading abilities, the questions were read out loud to second grade students. For further reliability, I took time to define any words they might not be familiar with. The responses were then examined by a third party to tabulate how many students identified with creative growth mindsets or creative fixed mindsets.

Table 1. Creative Growth Mindset Survey

**Art Mindset Survey**

Which mindset do you have?
Read each sentence and circle if you agree or disagree with it. There are no right or wrong answers.

1. People are born with the skills that make them an artist.
    a. Agree
    b. Disagree
2. You can learn new things, but you can't really change your artistic skill.
    a. Agree
    b. Disagree
3. No matter where you start in art, you can work to improve your skill.
    a. Agree
    b. Disagree
4. You can always change how artistic you are.
    a. Agree
    b. Disagree

For measuring initial fluency, students had ten minutes to complete a series of eighteen abstract lines (see Table 2). This line activity was inspired by the TTCT (1990) Figural assessment. Students were not allowed to interact during this activity. Each class was asked to think of as many different ideas as possible. Students were told the goal was to see how many different drawings the class could create from the same set of lines. This line challenge was given to students along with the creative mindset survey. After the drawings were rated for fluency, originality and elaboration, I then looked for associations between these initial scores and overall mindsets.

Table 2. Complete the Line Fluency Builder

Complete the following lines. What can you turn them into?
Try to think of as interesting of an idea as you can.
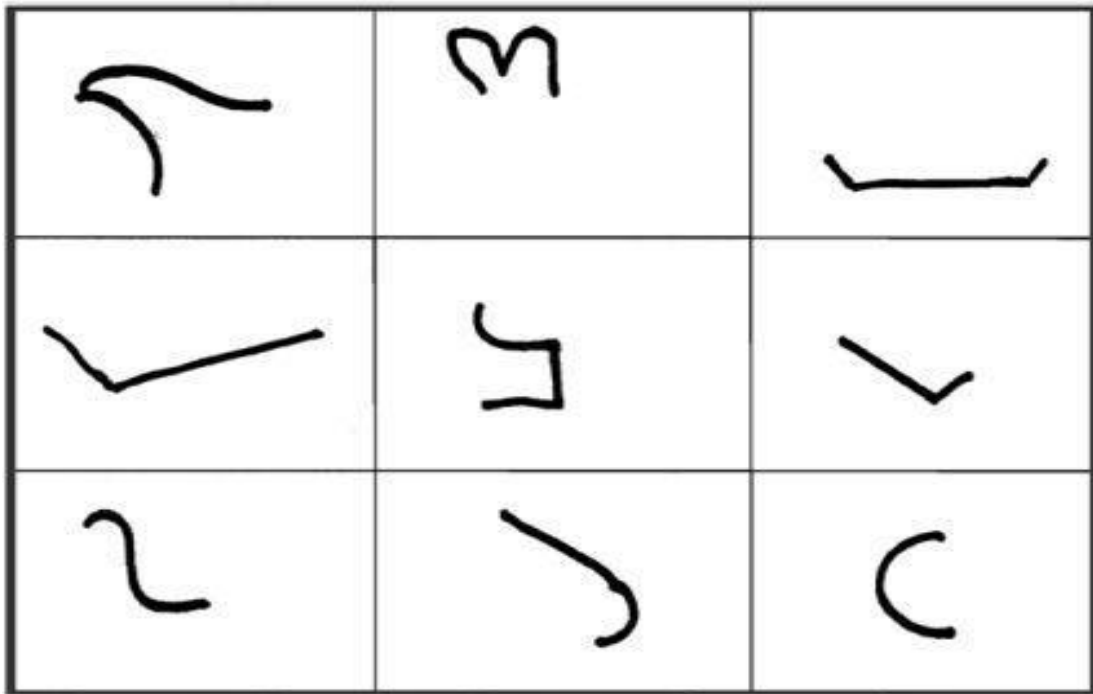
The color mixing challenge was designed to measure student fluency, flexibility, and originality partway through the unit (see Table 3). Students were asked to be color scientists. They were to experiment to create as many new color mixtures as possible using only the primary colors, black and white. For this portion of the unit students could share methods and creations with each other. While student engagement is not usually a problem in the art room, students seemed very excited, autonomous, and engaged in this experimental process. Students were asked to stop painting the last ten minutes of class to allow ample time to name their new colors.

Table 3. Color Mixing Challenge

Mix as many colors as you can in the circles below.
Challenge yourself to come up with as many new colors as you can!
What would you name each color? Write the name underneath each circle.
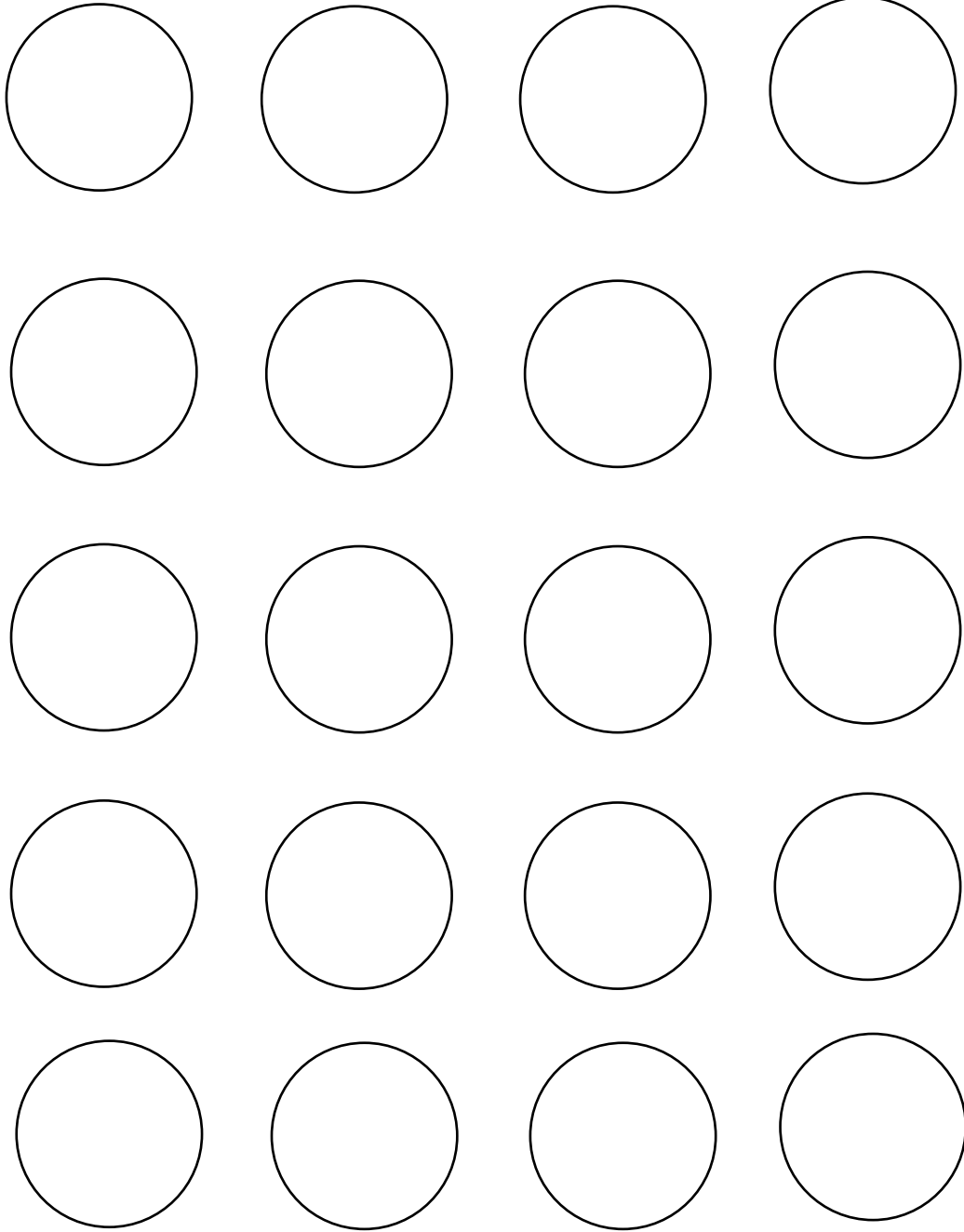
The final measurement consisted of a student reflective survey given at the end of the abstract art unit (see Table 4). The goal of this survey was to see if students recognized the qualities, such as persistence and effort, which most artists need to be successful or equated success with innate ability. I also was curious how these beliefs might impact their advice to a budding artist who is at a challenging spot in their work. These surveys were examined for common themes and overall percentage of students who identified growth or fixed characteristics within their answers.

Question 2 of the survey was inspired through a study conducted by Dweck (2006). Students in her study were asked what advice they would give someone in their class struggling with math. Responses were analyzed to see how students who had been previously identified with a fixed mindset responded compared to those who had been identified as having a growth mindset. I felt this might be a valuable question in art as well because some students decide they simply are not good at art as they progress through sixth grade. It becomes an identity instead of something they could improve upon with practice.

Table 4. Advice to Classmate Reflective Survey

1. Out of the artists we looked at, who do you consider to be a great artist? What makes them such a great artist?

2. What advice would you give a classmate who was struggling with their art?

Throughout the unit I observed student process and engagement through anecdotal notes. I also continued to tally the types of feedback I gave and the types of questions students asked. Through daily class discussion in sixth grade art, students were able to reflect on an additional set of questions (see Table 5). I was curious what activities made students feel confident in themselves and why. I then related the discussion back to art to see if students would associate the effort they put into that activity with the effort they put into learning a new art skill. These questions guided the discussion that day as we examined evidence of artists' struggles and persistence. I wrote down quick observations of common threads in students' discussions to later reflect on for evidence of growth or fixed qualities within our classroom atmosphere.

Table 5. Guiding Questions for Class Discussion

1. What is one thing you are really good at?

2. How did you become so good at it?

3. When especially do you feel good at art?

4. What would the perfect art project look like for you?

Data Analysis Procedures

This study had two research questions:

1. Is there a positive association between high fluency levels in art and a growth mindset?

2. If this positive association does exist, what strategies can be implemented within an art classroom to promote a creative growth mindset and improve overall divergent thinking skills?

Daily data was analyzed through observations and anecdotal notes. I also used qualitative and quantitative methods to analyze daily warm-up activities. Quantitative methods were useful in determining percentages of students exhibiting specific mindsets, as well as the frequency of occurring divergent thinking characteristics. Likewise, qualitative methods allowed me to examine student surveys for common threads or patterns in thinking.

My initial tally data was scored quantitatively using straight percentage comparisons. This gave me a clear assessment of how often I engaged in growth feedback and generic praise feedback. In addition, student question types were also scored in this manner. From this initial data, I determined what mindset was being fostered in the current atmosphere of my classroom. As the unit progressed, I continued to keep track of these tallies by recording percentages for each week of the unit. This helped me identify if there appeared to be any changes in the classroom atmosphere. A quantitative approach was best to analyze responses to the student mindset survey as well. Within the two grade levels, surveys were rated fixed, growth or mixed based on which answers students chose in response to the four mindset questions listed. These were then recorded as straight percentages between the two grade levels.

Divergent thinking traits were measured quantitatively from both the line challenge and the color mixing challenge. Student work was first grouped by mindset and then scored for fluency, flexibility, originality and elaboration using a 3, 2, 1, scale for each category:

3- Student response indicates high level of the trait present.

2- Student response indicates average level of trait present.

1- Student response indicates little to no presence of trait.

Percentages were then tabulated by grade level for the presence of each of these traits within the corresponding mindset. Hence, fluency was first calculated for both assessments by counting the overall number of completed circles or lines. From this, a range for one, two and three was created from the lowest number of items completed to the highest. Flexibility applied to the color mixing challenge only. Among the colors mixed, total numbers of varieties were calculated. For instance, if a student had nine colors mixed, but five of them were all various shades of red and the other four were a type of yellow, gray, orange and blue, the student's flexibility score would be five. From this data, a high, medium and low range was created to correspond with the three, two and one rating.

Originality was calculated on both assessments. For the color mixing challenge, the names chosen for each color were considered. If students chose all unusual names, this ranked a three, a mixture of both normal and unusual names, a two, and finally all normal names, a one (see Figure 1). However, for the line fluency builder, each line was looked at individually to see how many different ideas students had for each line. From this a list of highly occurring to rarely occurring ideas was compiled. The high frequency items were rated a one in originality, while on the other end of the scale, the rarely occurring ideas were given a three. Finally, elaboration was calculated for the line fluency builder by comparing each line prompt across the grade level to see what constituted low, medium and high detail per line (see Figure 2).
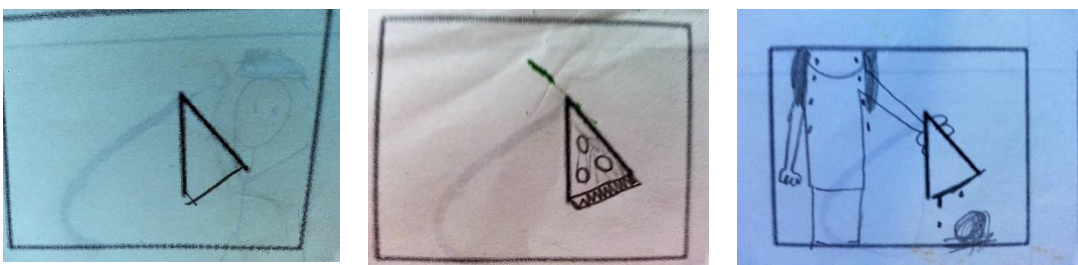
Figure 1. Color Mixing Challenge – Variances in Fluency and Originality

*Example 1: High Fluency/Medium
Flexibility/Low Originality*

Example 2: Lower Fluency/Higher Originality

Figure 2. Line Fluency Builder – Low, Medium and High Elaboration

Qualitative data was gathered from the final student survey, class discussion and anecdotal notes. Within the student advice survey, I looked specifically for evidence of growth or mindset characteristics in the way the student chose to give advice to their struggling classmate. I also looked for overall percentage of students who identified growth or fixed characteristics within their answers. Based on student responses, I tried to identify if students were internalizing

any growth mindset beliefs. This data provided me with a comparison between pre and post mindsets in each grade level. Similarly, through class discussion and my notes I gauged classroom atmosphere, common themes, celebrations and struggles faced by students.

Limitations

Limitations to this study include the length of the study and the possibility of inaccuracies in self-reported data such as observation and anecdotal notes. As both researcher and educator, my role was strained between not only trying to observe student interactions and processes, but also facilitate student learning. It is possible I missed important factors that would further define this study. For future researchers, this could be remedied through recording student interactions and processes. These recordings could later be examined for more accuracy. The length of the study could also impact the reliability of the results. Beliefs and attitudes regarding learning do not change overnight (Dweck, 2006). To truly see what impact student belief and classroom atmosphere have on creativity, it would be interesting to create a longitudinal study by collecting similar data from these same groups over specific time spans. These findings could potentially validate if positive associations between mindset and creativity do exist.

RESULTS

For this next section, I will be summarizing the qualitative and quantitative results of this study. These results will be analyzed to address the following research questions:

1. Is there a positive association between high fluency levels in art and a growth mindset?

2. If this positive association does exist, what strategies can be implemented within an art classroom to promote a creative growth mindset and improve overall divergent thinking skills?

The first section will begin by examining the impact of classroom atmosphere on students' creativity based upon the quantitative data I collected from student question types and teacher feedback. In addition to this, through observational qualitative data, I will consider the role class discussion has on building a growth mindset culture within an art room. Next I will examine the line fluency builder and color mixing challenge. The data from these two divergent thinking assessments will be analyzed for trends between growth mindsets and fixed mindsets. The impact of peer interaction will also be considered on these two activities. Finally, I will examine the final reflective student survey for common themes in student thought and evidence of growth.

Classroom Atmosphere

Before I began this study, it was important that I assess the current learning atmosphere within my classroom. Many important creative traits, such as willingness to take risks and independence of judgment, are nurtured in environments where students feel they can freely

express themselves. I was curious to determine if students viewed my role in the classroom as a facilitator or judge of their creative endeavors.

Student Questions and Teacher Feedback

One week before implementing any growth mindset strategies, I tallied the types of questions second and sixth grade students asked of me and the type of resulting feedback I gave to students. Tallies were marked under *Validation* whenever students' questions asked me to judge their work. If the student asked a question regarding technique, strategy or artistic processes, I put a tally under *Process.* Likewise, I kept track of my own responses. Generic praise was marked under *Fixed*, while specific feedback related to effort or process was tallied under *Growth* (see Figure 3).

While I expected to find that I was engaging in some generic feedback due to the busy nature of an elementary art room, the initial percentages took me by surprise. An astounding 89% of my feedback was generic in nature. I also was aware that students often ask me, "Is this good?", but once again, the actual numbers were staggering. Students overwhelmingly looked to me as an authority of their work with 95% of student questions seeking validation they were doing their art in a way I approved. There exists a very clear positive association between the feedback I give and the questions students ask. I knew over the following weeks I would have to drastically adjust my classroom practices to help students realize my role in the classroom is to help them devise strategies and improve artistic processes so they can learn to trust their own creative judgment.

Figure 3. Types of Feedback Given and Questions Students Asked in Both Grade Levels
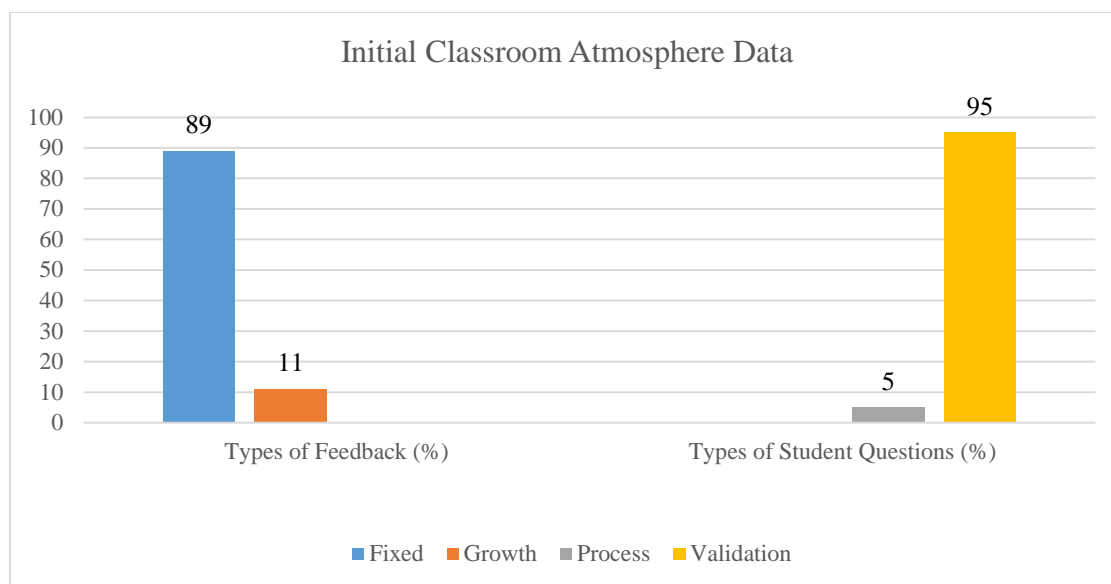
Role of Class Discussion

The first step in transforming our classroom was to address the misconceptions students had of my role as their teacher. We discussed the main question I am asked, "Is this good?" and the implications this had for our art making process. I told students my opinions of art were exactly that, opinions, and banned any further use of the question, "Is this good?" We continued by discussing the questions of, "What is art?" and "Who can make art?" There seemed to be a common belief among students that there is no such thing as bad art or that we are not allowed to say we do not like a type of art. While we certainly must be sensitive to how we phrase criticism of an art style, students must be taught to place value in their own opinions of what makes art successful. This discussion helped us set up guidelines as a class for asking questions and analyzing future art work.

As we continued our discussions of abstract art throughout the unit, I tried to incorporate the themes of risk taking, failure, persistence, and openness to experience. As noted by Starko

(2005), students need to be aware of the struggles and obstacles famous creative people have faced. Otherwise they are apt to associate success with innate talent and ease of effort. In one such discussion, sixth grade students were asked to contemplate an area they felt particularly strong in (see Table 5). Many students identified areas such as sports, the fine arts and school subjects. There were even some more unexpected skills such as chess, baking, communicating, humor and flying drones.

When students were pressed to contemplate what made them excel in that area, the themes identified were overwhelmingly traits associated with growth mindsets. Students talked about practicing, learning new strategies from their mistakes, experimenting with new techniques, and persisting over long periods of time. In a few cases, environment and the role of an adult mentor were even mentioned. Students spoke of gradually increasing the difficulty of what they were doing and how competing in that area drove them. Intrinsic motivators were identified too, such as wanting to be the best, or simply having a deep love for the area. While a few students identified innate talent as a factor, it was usually followed by recognition of the deep commitment and effort they had invested in that talent for it to thrive.

We continued this discussion by turning the focus back to art. While I know not all students feel successful in art, I asked them to think about a time they felt good about their work. Students were not as quick to identify growth characteristics here. A few described characteristics linked to flow (Csikszentmihalyi, 2014), or mentioned when they work hard and persist through a long, detailed project, but other factors such as mood, ideal atmosphere, choice of material or subject matter, time of day and even being praised by peers or the teacher for "good" work were identified.   Others identified even more vague concepts such as when they are creative, or the picture "comes alive" and turns out the way they envisioned.

Students' ideal art projects ranged from specific characteristics, such as messy, colorful, weird and neat, to the size, material and subject matter of the project. Some even said, "My ideal project is one that is not perfect." Few students identified the ideal project as one they had worked hard on or one that would require skill, technique and overall growth to complete. This notion that art should be more spontaneous, while other areas, like sports, required practice and persistence was surprising.

As for my own feedback, I continued to monitor my interactions with students. Over the course of these discussions and our subsequent classes, I continued to keep tally marks regarding my feedback and student questions. The first week I saw the most improvement in my own feedback as I was intensely aware of every interaction I had with students (see Figure 4). I would catch myself starting to give vague feedback, such as, "That looks great!" or "How beautiful!", before I would make myself pick a specific work habit, skill or characteristic of the work to comment on. At first, students seemed surprised that I was giving such specific feedback. However, as the unit progressed I found it easier and easier to recognize specific growth related characteristics.

Figure 4. Types of Feedback Given Throughout Abstract Art Unit in Both Grade Levels
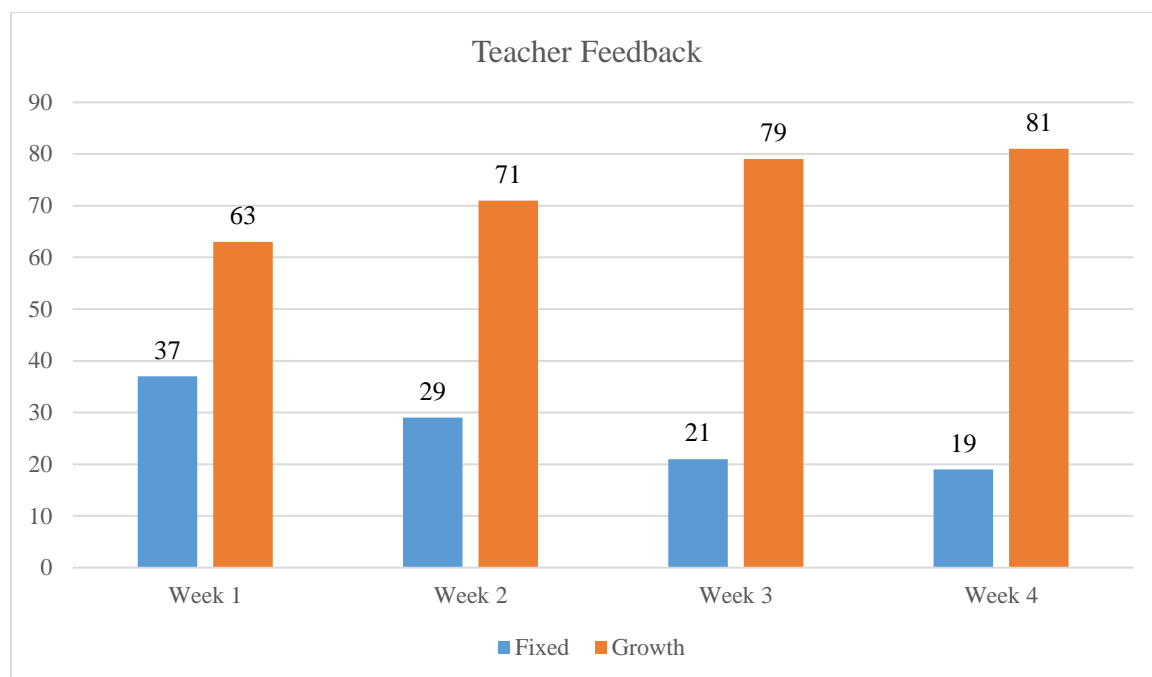
Despite this, students seeking validation from me continued to be a problem (see Figure 5). My sixth graders, with continual reminders, were better able to internalize the guidelines we created for questions, such as asking how to improve a technique. In fact, one student asked, "Is this good?", before catching themselves, smiling, and asking, "I mean, Mrs. Seibel, do you think my choice of color here makes sense?" In contrast, my second graders would look at me wide-eyed when I would put the judgment of their work back on the unit criteria and skills we hoped to improve. Often they would persist with, "Yes, but do YOU like my work?" Creating work that pleased the teacher seemed very important to the younger students.

Figure 5. Types of Student Questions Throughout Abstract Art Unit in Both Grade Levels
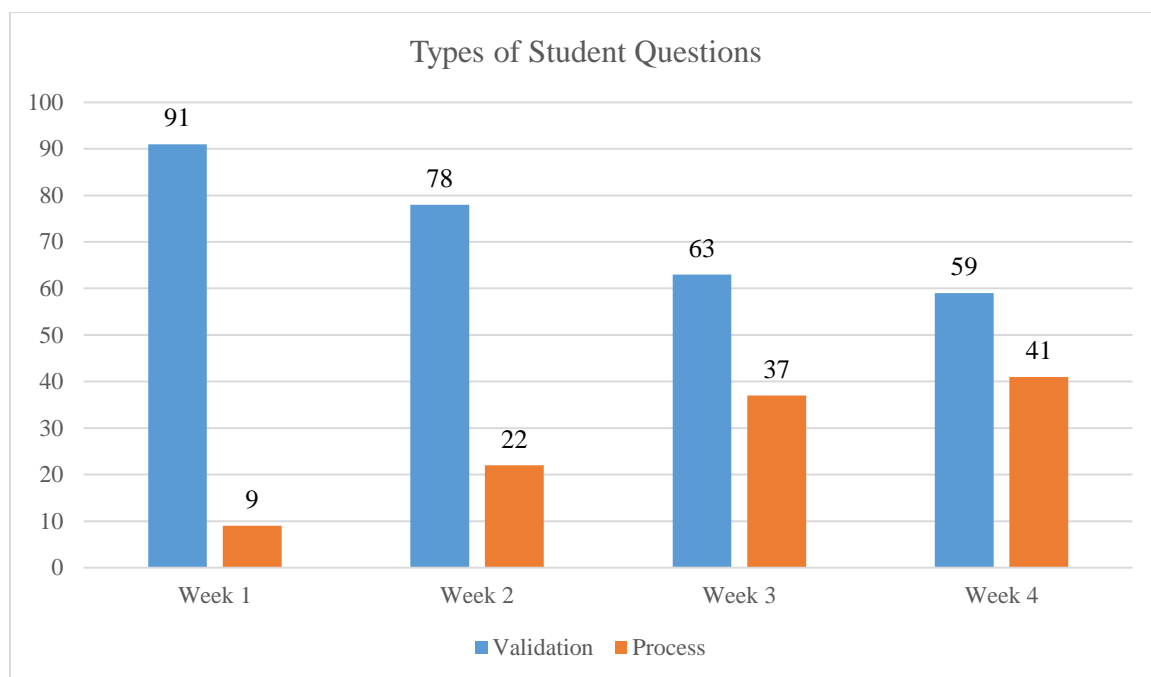

<div align="center">Divergent Thinking Assessments</div>

At the start of our unit, students completed an initial Art Mindset Survey to distinguish which mindset students currently identified with. Based on student responses to four questions, students were grouped into three categories: *Creative Growth Mindset*, *Creative Fixed Mindset* and *Creative Mixed Mindset*. Students also completed two divergent thinking assessments: a line fluency builder and a color mixing challenge. These were scored for fluency, flexibility, originality and elaboration. By comparing mindset with divergent thinking skills, I hoped to identify trends in creativity levels.

I was initially surprised when the percentages came back from the Art Mindset Survey (see Figure 6). Prior research has shown an increasing trend towards a fixed mindset as students progress through grade school (Ricci, 2013). My surveys came back the opposite. Of my second

grade students, 73% identified with a creative growth mindset, 22% with a creative fixed mindset and 5% with a creative mixed mindset. These numbers correspond closely to the percentages of fixed and growth mindsets Ricci found in her study of second graders. However, by third grade these numbers had increased further; 42% of the students she surveyed identified with a fixed mindset and 58% with a growth mindset. If this trend were to continue, it could be assumed the number of students with fixed mindsets would be over 50% by sixth grade. In contrast, 81% of my sixth grade students identified with a creative growth mindset, 10% with a creative fixed mindset, and 9% with a creative mixed mindset. These numbers show an increase in growth mindset, not a decline. Additionally, the presence of a creative mixed mindset correlates with Karwowski's (2014) findings that some individuals see creativity as being both an innate talent and something they can improve.

Figure 6. Results from Creative Growth Mindset Survey
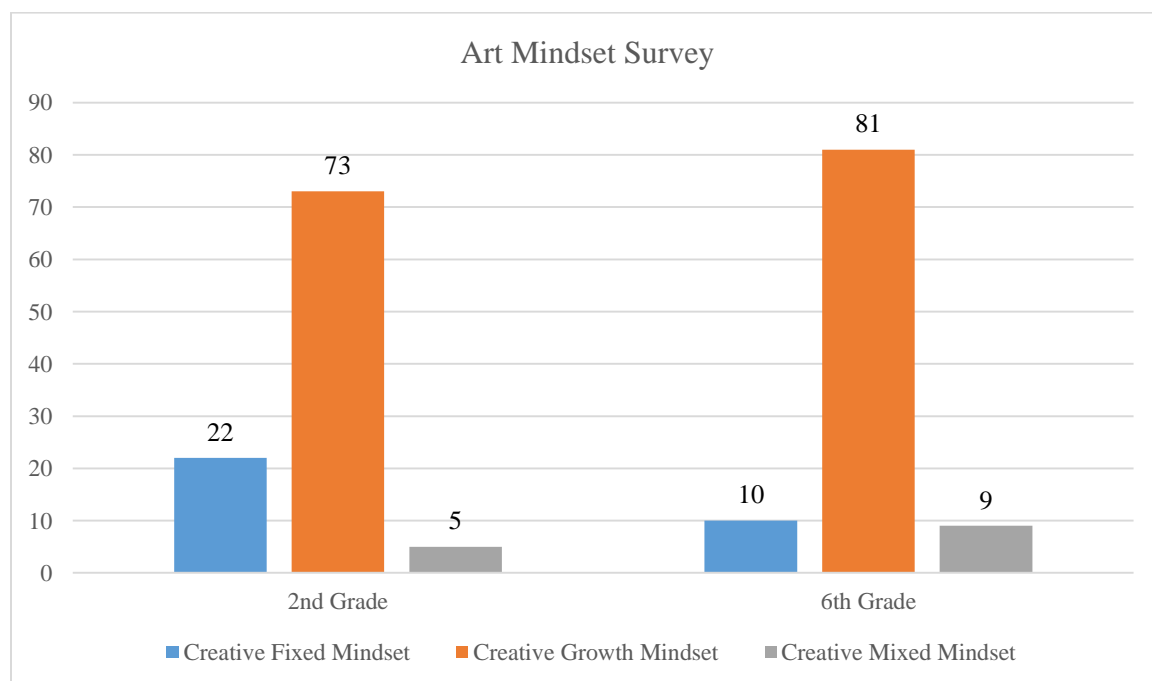
Next, these mindsets were compared with the divergent thinking scores from the line fluency builder and the color mixing challenge. These results were inconclusive overall. Sixth grade scores on the line fluency builder show slight variations between fluency and mindsets (see Table 6). Out of those who scored a 3 on fluency, a 9% gap existed in favor of the creative fixed mindset students. This gap increased to 16% when compared with the creative mixed mindset students. On originality, the creative fixed and creative growth mindset scores were too close to differentiate. Both these mindsets were significantly outscored in originality and elaboration by the creative mixed mindset. However, if the percent of students who scored a 2 or above is calculated for each category, percentages between all three mindsets become almost identical.

Second grade scores showed no significant change in fluency levels between mindsets. The creative growth mindset outscored both the fixed and mixed mindsets in originality and elaboration with a 13% gap on both for those who scored a 3. When compared across grade levels, students with a creative growth mindset scored similarly in all three divergent thinking skills. Fluency levels across grade levels were similar as well. In contrast, sixth grade students with the creative fixed and creative mixed mindset outscored second graders of the same mindsets on originality and elaboration. This could be due to greater skill with mediums and more experiences to draw upon for inspiration.

Table 6. Fluency, Originality and Elaboration Scores from Line Fluency Task

Student Line Fluency Builder Scores (by %)								
	Creative Fixed Mindset			Creative Growth Mindset			Creative Mixed Mindset		
(n=90)	Average Score (n=9)			Average Score (n=73)			Average Score (n=8)		
6th Grade	3	2	1	3	2	1	3	2	1
Fluency	78	11	11	69	27	4	62	38	0
Originality	11	56	33	11	54	35	38	24	38
Elaboration	11	56	33	19	44	37	38	24	38
(n=84)	Average Score (n=19)			Average Score (n=61)			Average Score (n=4)		
2nd Grade	3	2	1	3	2	1	3	2	1
Fluency	74	26	0	74	26	0	75	25	0
Originality	0	26	74	13	47	40	0	25	75
Elaboration	0	11	89	13	33	54	0	25	75

Among sixth grade students, fluency and originality scores were very similar across all three mindsets on the color mixing challenge (see Table 7). The only notable difference occurred in flexibility, or variety of colors created. The creative fixed mindset significantly outscored both the creative growth and creative mixed mindset with 68% of students in this category scoring a 3. This compares to 58% for the creative growth mindset and 38% in the creative mixed mindset. The second grade results provided no marked differences between mindsets and divergent thinking characteristics. Due to the low number of students who identified with a creative mixed mindset and a creative fixed mindset, it is also difficult to generalize these results.

When grade levels are compared on the color mixing challenge, second graders outscored sixth graders in fluency. In contrast, sixth graders significantly outscored second graders in flexibility. This could be due to greater prior experience with color mixing. Indeed, sixth graders generally mixed fewer colors, but those created were more diverse. This agrees with MacKinnon's (1978) findings that greater fluency does not always equal more creative work. Originality scores were slightly higher for sixth graders. Once again, if the percent of students who scored a 2 or above is calculated, differences among fluency become almost nonexistent. Flexibility and originality scores continue to be higher among sixth grade students.

Table 7. Fluency, Flexibility, and Originality Scores from Color Mixing Challenge

Color Mixing Challenge Scores (by %)								
	Creative Fixed Mindset			Creative Growth Mindset			Creative Mixed Mindset		
(n=90)	Average Score (n=9)			Average Score (n=73)			Average Score (n=8)		
6th Grade	3	2	1	3	2	1	3	2	1
Fluency	34	56	10	44	49	7	38	62	0
Flexibility	68	22	10	58	37	5	38	62	0
Originality	44	22	34	55	12	33	50	25	25
(n=84)	Average Score (n=19)			Average Score (n=61)			Average Score (n=4)		
2nd Grade	3	2	1	3	2	1	3	2	1
Fluency	58	42	0	52	48	0	50	25	25
Flexibility	0	89	11	7	82	11	0	75	25
Originality	42	11	47	52	7	41	0	25	75

Role of Peer Interaction

One interesting difference exists between the originality scores on the line fluency builder and the color mixing challenge. Overall, students significantly performed better in this category on the color mixing challenge. This could be due to the experimental nature of mixing paint. Indeed, students were very engaged in this process and some students told me it was their favorite activity. However, another factor that could be impacting this score is the difference in peer interactions. For the line fluency builder, I specifically told students they were not allowed to share ideas. This resulted in many bunnies, trees, kites, fish and ice cream cones. Originality was lacking overall.

In contrast, I allowed students to interact freely during the color mixing challenge. Not only did students excitedly share how they had mixed colors, perhaps increasing fluency and flexibility, but they also were eager to tell each other the names they were choosing for each color. From my observations, once one student chose an unusual name for a color, the rest of the students quickly followed as if it were a competition to create the most original name for their color. While second graders acted more independently, freely choosing names for their colors, sixth grade students were more likely to seek permission before choosing unique names. They seemed surprised that they did not have to be logical names.

<center>Evidence of Growth</center>

The final task students engaged in was an end of the unit reflective survey. One of the prompts students responded to was, "Out of the artists, we looked at, who do you consider to be a great artist? What makes them such a great artist?" These answers were examined for qualities related to fixed traits and growth traits (see Figure 7). Students identified characteristics such as being a lifelong learner, persistence, experimentation or willingness to take risks, ability to

communicate ideas through work, and consistent practice to build a specific skill or style. Other factors listed included nurtured environment and innate talent.

The percentage of sixth grade students who identified the importance of the artist being a lifelong learner and continually experimenting or taking risks in their artwork was 23%. This was closely followed by a nurtured environment at 17% and the development of a specific style at 14%. Persistence as an important trait was noted by 8% of students. Encouragingly, only 5% of sixth grade students identified innate talent as necessary to become a great artist. This is even lower than the original 10% who identified with a creative fixed mindset when initially surveyed.

When these traits are categorized together in terms of growth or fixed nature, 78% of students identified growth characteristics as necessary to an artist's success, 17% believed environmental factors were relevant, and only 5% identified fixed characteristics.

Figure 7. Characteristics of Great Artists as Identified by Sixth Grade Students
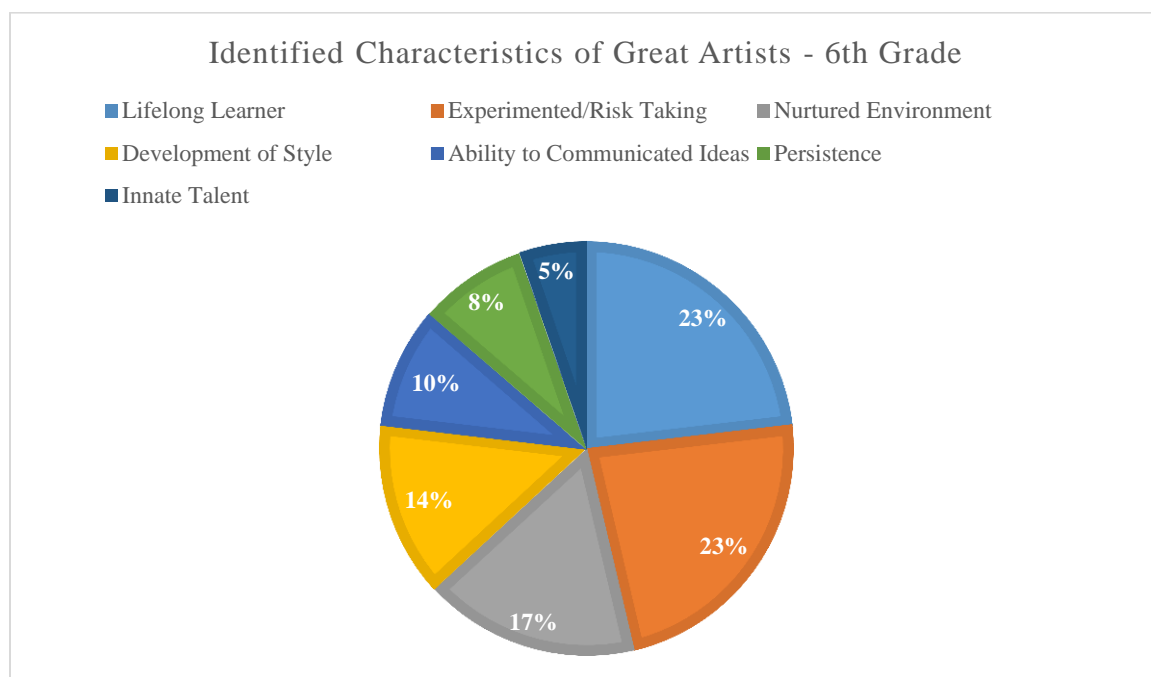
These findings contrasted with second grade responses. Students in this grade were more likely to list vague traits such as the artist had a good imagination or loved art (see Figure 8). Like sixth graders, 27% identified lots of practice or experience (persistence, lifelong learner). At 19%, students at this age had higher responses that the artist was born with a "special" skill. While only 11% of students identified effort as necessary for an artist to be successful. A good imagination ranked the highest at 29%. One trait identified by second graders that was not mentioned by sixth graders was a love for art. When these characteristics are categorized like they were for sixth grade, only 38% identified growth related traits. At 43%, the vague traits, love of art and good imagination, ranked higher, while inborn talent ranked lower at 19%. This number corresponds closely with the original 22% who identified creative fixed mindsets on the initial survey.

Figure 8. Characteristics of Great Artists as Identified by Second Grade Students
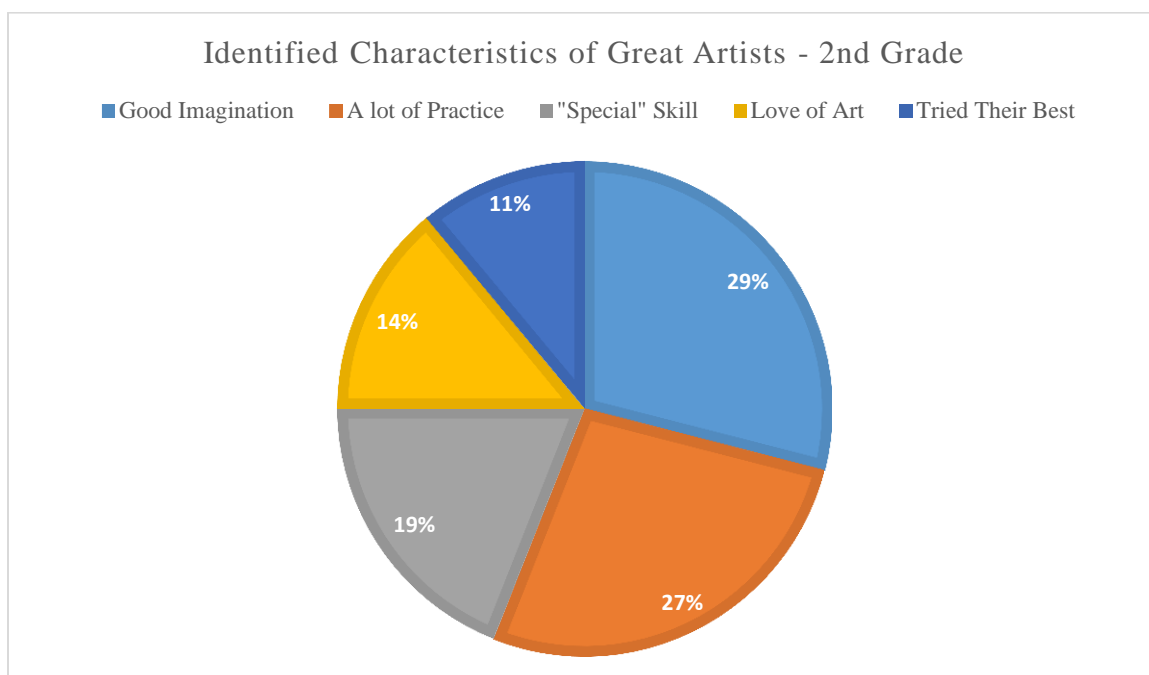
Encouragement or Strategy

The second prompt on the final reflective survey was, "What advice would you give a classmate who is struggling in art?" Two themes presented themselves in students' responses: encouragement and strategies. Common encouragements included, "Its ok.", "There is no such thing as bad art.", "Believe in yourself." and "Keep trying!" Some students even gave the advice of "Just wing it!" or "Do what you want." While students meant to motivate with these encouragements, they notably are lacking any specific strategy the struggling student could use to improve their artwork.

The other type of responses presented gave the struggling student a specific strategy they could use to improve. These included suggestions such as slowing down, starting with smaller areas and working to larger areas, taking a deep breath, asking for help from the teacher, practicing the specific skill more, or telling them to learn new strategies from their mistakes. These students were also more likely to offer to be a mentor if they themselves possessed the needed skill.

When these responses were categorized by the creative mindsets students had initially identified with, differences arose between the mindsets in both second grade and sixth grade students. Among the second grade students who identified with a creative growth mindset, 56% gave encouragement and 44% gave strategies the student could use (see Figure 9). In contrast, of those students in second grade who identified with a creative fixed mindset, 43% offered encouragement, 37% gave strategies and a surprising 18% gave no advice at all.

Figure 9. Student Advice to a Struggling Artist
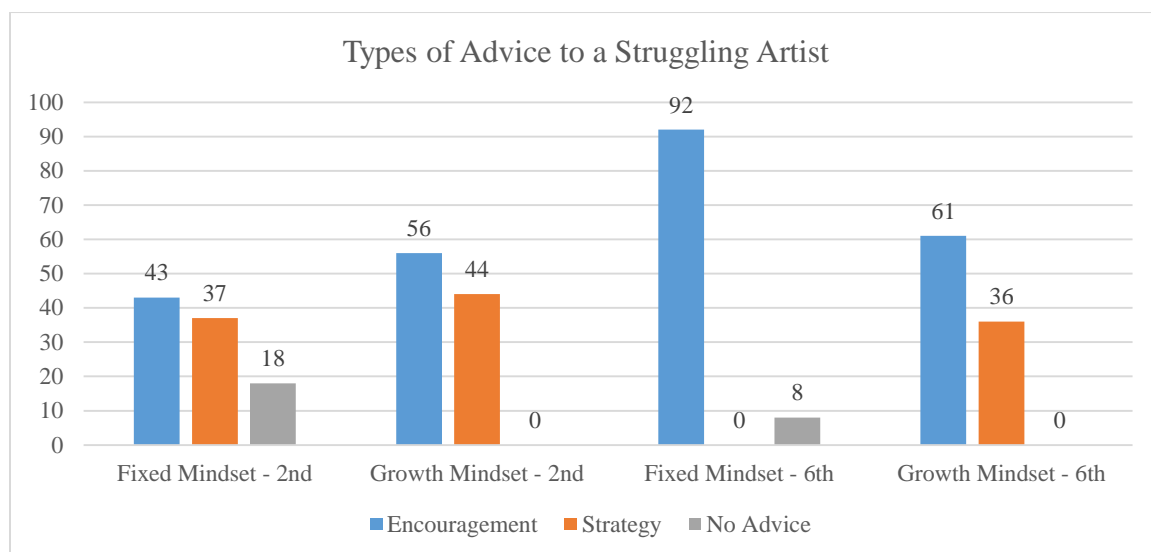
Among sixth grade students these variances were even greater. Students who held a creative fixed mindset were more likely to use encouragement to inspire a struggling classmate. Responses were also vague. For example, they included "There is no bad art.", "Try!", "Think outside the box.", and "Go with the flow." Students with this mindset did not identify any specific strategies the student could use and, similarly to the second graders, 8% gave no advice. While not as high, 61% of sixth grade students who identified with a creative growth mindset chose encouraging words. Only 36% offered a specific strategy the student could try. While both grade levels showed higher percentages of strategy advice amongst creative growth mindsets, the majority of advice given throughout all mindsets was in some form of encouragement. There could be many factors outside of mindset impacting these numbers. Students could be lacking in specific strategies to share with a peer or unconfident in their ability to successfully help a neighbor. They also might feel the need to comfort a classmate which would also lead to more encouraging words. Regardless, these theories need more investigating.

DISCUSSION

This study had two central goals, first to identify if a positive association existed between students' mindsets and their divergent thinking skills. The second was to explore which environmental and instructional factors are optimal for nurturing a creative growth mindset with the intention of improving students' overall creativity. Students who hold a creative growth mindset believe their creativity can be improved through specific strategies and continual effort. This can lead to greater persistence and higher levels of engagement, especially when faced with more challenging tasks. This is particularly important as students in primary grade levels progress from basic art skills and procedures to more sophisticated artistic concepts as they enter intermediate grade levels. By analyzing this mindset more closely, we can begin to understand which strategies and environmental factors best equip students to meet these needs.

<u>Fluency and a Growth Mindset</u>

Seeking to address the first research question, "Is there a positive association between high fluency levels and a growth mindset?", second and sixth grade students at Riverdale Heights Elementary took part in a creative growth mindset survey and two art challenges designed to measure fluency, flexibility, originality and elaboration. Students first agreed or disagreed with the following statements:

People are born with the skills that make them an artist.

You can learn new things, but you can't really change your artistic skill.

No matter where you start in art, you can work to improve your skill.

You can always change how artistic you are.

The result of student responses to these questions indicated that the majority of second and sixth graders held a creative growth mindset regarding their ability in art. These numbers were especially high in sixth grade when considering previous research that points to an increasing trend towards a fixed mindset as students progress through grade school (Ricci, 2013). While small in percentages, results further identified the presence of a creative mixed mindset among both grade levels, supporting Karwowski's (2014) findings that individuals can simultaneously hold both mindsets.

Next, students completed two art assessments designed to measure divergent thinking skills. When these scores were examined among mindsets, the first assessment, a line fluency builder, had inconclusive results. While sixth grade students who identified with a creative fixed mindset had slightly higher levels of fluency, second graders showed no significant change across mindsets. However in this grade level, the creative growth mindset did outscore the other mindsets in both originality and elaboration. This could indicate among students of this mindset willingness or desire to explore more unusual ideas.

Likewise, only small variances were present among scores for the second assessment, a color mixing challenge. Notably, sixth grade students had greater flexibility and originality than second graders. This could be due largely to greater prior experience with color mixing concepts. When these two assessments were compared side by side, students scored higher in originality scores on the color mixing challenge. The ability to interact with peers during this challenge may have impacted these scores. This finding could support other researchers' theories that creativity does not happen in isolation, but is influenced by interactions with the environment (Csikszentmihalyi, 2014; Rogers, 1961). Due to the small number of students in this study who identified with a creative fixed mindset and a creative mixed mindset, a larger sample size would be needed to confirm these results.

<u>Role of Feedback</u>

The second research question sought to better understand which factors related to environmental and instructional factors can nurture or suppress a creative growth mindset. To better understand the current atmosphere, data was collected by analyzing the types of questions students asked and the types of feedback given in response. These initial results revealed high levels of generic feedback. This was positively associated with high levels of students seeking validation when they asked questions. Despite increasing the amount of specific, progress-related feedback throughout the unit; many students still had difficulty shifting their perspective of the teacher as a facilitator rather than judge. This was especially apparent among second grade students. This result demonstrates the need not only for specific feedback that recognizes student growth, effort, and choice within their work, but also the need to provide strategies the students can internalize to build independence in judgment. This will aide students in developing solid criteria when evaluating their own work or ideas, and places the focus back on learning and growth.

<u>Strategies for Future Growth</u>

To better understand how students perceive the creative process and evaluate any shifts in student mindset, the study concluded with a final reflective survey. Students responded to the following questions:

Out of the artists we looked at, who do you consider to be a great artist?

What makes them such a great artist?

What advice would you give a classmate who is struggling in art?

Among sixth grade students, responses to the first two questions indicated an even lower presence of fixed mindset characteristics than the initial mindset survey. By placing the focus

throughout the unit on the specific ways each artist had to persist, take risks, and even fail, before finding success, students seemed better equipped to recognize the tools and strategies that led to that artist's success. However, while the second grade students were able to recognize a few growth characteristics in the artists, they placed higher value on innate ability or vague characteristics. This could be due to the more general way adult role models might praise younger children instead of identifying very specific skills and strengths they may possess.

The final prompt measured whether students gave encouragement or specific strategies to help their struggling classmate. While both grade levels showed higher percentages of strategy advice amongst creative growth mindsets, the majority of advice given throughout all mindsets was in some form of encouragement. This finding highlights the need for students to have a bank of specific strategies they can pull from when they are struggling. It is possible that many gave vague, encouraging advice because they themselves are currently not equipped with the strategies needed to grow.

<u>Summary</u>

The results of this study indicate that the majority of students in second and sixth grade identified with a creative growth mindset regarding their artistic ability. However, when mindsets were compared with divergent thinking skills to investigate any variances in creativity levels, results were inconclusive. Though slight variations existed, none were consistent across both grade levels and specific mindsets. Result also showed students can be taught to recognize the specific characteristics most creative people possess. While younger grade levels were more likely to internalize vague characteristics, this could be remedied through specific feedback and instruction framed around growth characteristics.

While most students surveyed identified with a creative growth mindset and believed their creative ability could be improved, the final survey indicated the majority of students are unable to give specific, strategy-based advice to help another student improve. This could indicate the absence of those strategies in their own repertoire. These findings suggest that students of all ages need very specific feedback regarding their artistic process so they can further gain confidence in their creative ability and recognize the strategies and tools that will allow them to exhibit independence of judgment. It can also not be assumed that older students are aware of the strategies they are enacting. Often students act intuitively without a full understanding of why their outcome met with success. Based on these results, it is my belief that instructors who can give process-based feedback, while also helping students devise specific strategies to pull from when needed, will enable students of all mindsets to exhibit growth in the creative process.

Implications for Future Research

My results provide insight into the beliefs students hold about their ability to create art. To gain more understanding of how these beliefs impact overall creativity, I would recommend assessing more than one creativity trait and increasing the sample size. While students with high fluency may have a greater chance of producing more varied, original ideas, if students see no value in the assessment, the results may not show their true potential. Likewise, there are many other traits that demonstrate creativity, such as problem finding. One variation to consider could be to first have students find a problem in art they believe is important to investigate and then measure for evidence of divergent thinking qualities. This might produce more authentic measures if students are personally invested in the creative process and see the value in what they are trying to accomplish.

I also would suggest revising the first line fluency builder assessment. This assessment provided students with a variety of line prompts to complete. It seemed fairly easy for most students to come up with at least one idea per line, but if the line had been the same each for each box, results would more accurately reflect which students could successfully brainstorm multiple solutions to completing the same line over and over. Time would be another factor that could be manipulated. It would be equally interesting to see how categories such as originality and elaboration would be impacted if students were not held to time constraints. This might be a scenario where the use of a control group would be helpful.

Additionally, I would recommend a third party or recording be used to improve accuracy of self-reported data such as observation and anecdotal notes. As both researcher and educator, my role was strained between not only trying to observe student interactions and processes, but also facilitate student learning. It is possible I missed important factors that would further define this study. For future researchers, this could be remedied through recording student interactions and processes. These recordings could later be examined for more accuracy.

The length of the study could also impact the reliability of the results. Beliefs and attitudes regarding learning do not change overnight (Dweck, 2006). To truly see what impact student belief and classroom atmosphere have on creativity, it could be valuable to create a longitudinal study by collecting similar data from these same groups over specific time spans. These findings could potentially validate if positive associations between mindset and creativity do exist.

<div align="center">Implications for Art Education</div>

The first implications of this research for the art education field is it provides evidence the majority of students in elementary schools believe they can improve their creative ability.

However, if they are not equipped with the tools or the understanding of how to use those tools, much creativity can be inhibited or lost with time (Maslow, 1968). This is important for teachers to consider as they plan for instruction. As part of the field that influences students' art making process, teachers can unintentionally judge and assign value to students' creative efforts. Instead, educators should consider their role as valuable mentors who can nurture creative growth by equipping students with the tools they need to develop independence of judgment. If students are not given the opportunity to develop independent judgments, they are at risk of being needy and dependent solely on their teacher's judgment.

This leads to a second implication in this study. Teachers need to be aware of what strategies they can use to create atmospheres in their classrooms conducive to fostering student creative behavior. Current methods used to promote a creative atmosphere in the art room, such as studio habits of the mind (SHoM; Hetland et al., 2013), or Getting's (2016) artistic design aesthetics, would be possible starting points. These methods align with a creative growth mindset and teach students strategies to stretch and improve their creative thinking.

Likewise, it is important for all educators to understand the role creativity plays in academic subjects as well. Creative thinking skill are important in an educational setting because they teach students to brainstorm many possible ideas or solutions, from a variety of views, before choosing and elaborating on their more original concepts. Many elementary art educators see students once per week. If we hope for students to internalize important problem finding skills or to stay curious in life and continually seek new questions to explore, it is vital teachers encourage varying views, and model creative behaviors themselves. By helping students identify strategies that meet their needs and providing specific, process-based feedback, teachers allow students to go beyond effort and build autonomy in learning.

CONCLUSION

The results of my study found that most elementary students in second and sixth grade believe creative ability can be improved and identify with a creative growth mindset. This study also validated the impact environment can have on equipping students with the strategies needed to build creativity and independence in judgment. While no definitive connection was found to exist between strong divergent thinking skills and a specific mindset, the existence of these mindsets among elementary aged students are consistent with similar creative mindset studies done with adults by Karwowski (2014), as well as growth mindset research with students in other content areas, including preschool (Dweck, 2007), and ESOL students (Ricci, 2013). These studies, no matter the content or age level, agree that individuals who believe they can continually grow, and are taught necessary strategies to implement for growth, are more likely to demonstrate persistence and take on new challenges.

In conclusion, an environment that recognizes and seeks to nurture creative growth is beneficial to the development of a creative growth mindset. As individuals who believe themselves capable of creativity are more likely to demonstrate creativity, this is important for both instructor and student. Students with this mindset are more likely to "engage and persist" (Hetland, Winner, Veenema, & Sheridan, 2013) when faced with challenging tasks that stretch their ability. By equipping students with specific strategies to overcome these challenges and giving process-based feedback when needed, students are more likely to be able to analyze their creative endeavors with specific, individual criteria and develop independence of judgment. The benefits of student autonomy in the learning process travel well beyond the classroom. Students who are autonomous are more likely to seek out the tools they need to succeed. These are the types of people we need as our future problem solvers, thinkers and inventors.

REFERENCES

Aljughaiman, A., & Mowrer-Reynolds, E. (2005). Teachers' conceptions of creativity and creative students. *Journal of Creative Behavior, 39*(1), 17-34.

Annual Progress Report. (2016). Bettendorf, IA: Pleasant Valley School District.

Cimpian, A., Arce, H. M., Markman, E. M., & Dweck, C. S. (2007). Subtle linguistic cues affect children's motivation. *Psychological Science, 18*(4), 314-316.

Csikszentmihalyi, M. (2014). *The systems model of creativity.* Dordecht, Netherlands: Springer.

Dewey, J. (1920). *How we think.* Boston, MA: Heath.

Dweck, C. (2006). *Mindset: The new psychology of success.* New York, NY: Random House.

Dweck, C. (2007). Boosting acchievement with messages that motivate. *Education Canada, 47*(2), 6-10.

Dweck, C. (2016). Nurturing Growth Mindset: Six tips from Carol Dweck. *Education Week: Spotlight on Growth Mindset.* Retrieved from http://www.edweek.org

Esquivel, G. B. (1995). Teacher behaviors that foster creativity. *Educational Psychology Review, 7*(2), 185-202.

Gardner, H. (1982). *Art, mind, and brain: A cognitive approach to crativity.* New York, NY: Basic Books.

Gettings, M. (2016). Putting it all together: STEAM, PBL, Scientific Method, and the Studio Habits of the Mind. *Art Education, 69*(4), 10-11.

Gruber, H. E. (1988). Inching our way up Mount Olympus: The evolving systems approach to creative thinking. In R. J. Sternberg, *The nature of creativity* (pp. 243-270). New York, NY: Cambridge University Press.

Guilford, J. P. (1986). *Creative Talents: Their nature, uses and development.* Buffalo, NY: Bearly Ltd.

Hetland, L., Winner, E., Veenema, S., & Sheridan, K. M. (2013). *Studio thinking 2: The real benefits of visual arts education* (2nd ed.). New York: Teachers College Press.

Karwowski, M. (2014). Creative mindsets: Measurement, correlates, consequences. *Psychology of Aesthetics, Creativity, and the Arts, 8*(1), 62-70.

Keifer-Boyd, K. T., & Maitland-Gholson, J. (2010). *Engaging Visual Culture.* Worchester, MA: Davis Publications.

Kim, K. H. (2006). Can we trust creativity tests? A review of the Torrance Tests of Creative Thinking (TTCT). *Creativity Research Journal, 18*(1), 3-14.

Kim, K. H. (2008). Underachievement and creativity: Are gifted underachievers highly creative? *Creativity Research Journal, 20*(2), 234-242.

Kim, K. H. (2011). The creativity crisis: The decrease in creative thinking scores on the Torrance Tests for Creative Thinking. *Creativity Research Journal, 23*(4), 234-242.

Kohn, A. (1993). Choices for children: Why and how to let students decide. *Phi Delta Kappan, 75*(1), 8-20.

Landau, E. (2010). *Jackson Polluck.* New York, NY: Abrams.

MacKinnon, D. W. (1978). *In search of human effectiveness.* Buffalo, NY: Creative Education Foundation.

Maslow, A. H. (1968). *Towards a psychology of being.* Princeton, NJ: Van Nostrand.

Masters, G. N. (2013). *Towards a growth mindset in assessment.* Camberwell, AUS: ACER.

Perkins, D. N. (1981). *The minds best work.* Cambridge, MA: Harvard University Press.

Ricci, M. C. (2013). *Mindsets in the classroom: Building a culture of success and student acchievement in schools.* Waco, TX: Prufrock Press.

Rogers, C. (1961). Towards a theory of creativity. In C. Rogers, *On becoming a person: A therapist's view of psychotherapy* (pp. 347-362). Boston, MA: Houghton Mifflin.

Runco, M. A. (2014). *Creativity: Theories and themes: Research, development, and practice* (2nd ed.). Sandiego, CA: Elsevier.

Starko, A. J. (2005). *Creativity in the classroom: Schools of curious delight.* Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Torrance, E. P. (1990). *The Torrance Tests of Creative Thinking.* Bensenville, IL: Scholastic Testing Services.

Wallas, G. (1926). *The art of thought.* New York, NY: Harcourt Brace.

Weisburg, R. W. (1986). *Creativity and other myths.* New York: Freeman.