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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

FOSTERING CREATIVITY AND INNOVATION IN  
GIFTED STUDENTS THROUGH THE EYES  
OF GIFTED EDUCATION EDUCATORS

A Dissertation Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy

Omar Abdullah Alsamani

College of Education and Behavioral Sciences  
School of Special Education

May, 2019

This Dissertation by: Omar Abdullah Alsamani

Entitled: *Fostering Creativity and Innovation in Gifted Students through the Eyes of Gifted Education Educators*

has been approved as meeting the requirement for the Degree of Doctor of Philosophy in College of Education and Behavioral Sciences in the School of Special Education.

Accepted by the Doctoral Committee

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Accepted by the Graduate School

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## ABSTRACT

Alsamani, Omar A. *Fostering Creativity and Innovation in Gifted Students through the Eyes of Gifted Education Educators*. Published Doctor of Education dissertation, University of Northern Colorado, 2019.

In this era of advanced technology and with the increasing societal demand for individuals who possess skills in creativity and innovation, understanding educators' perceptions and experiences fostering creativity and innovation in K-12 settings is a timely and relevant research topic. Prior research has emphasized the need to acquire a deep understanding of educators' perceptions and experiences fostering creativity and innovation within school contexts. Based on recommendations from in the literature, this qualitative phenomenological study recruited eight trained gifted education educators with varied experiences in the field of gifted and talented education to better understand their perceptions and experiences fostering creativity and innovation in gifted students in K-12 settings. Specifically, the researcher attempted to explore these gifted education educators' perceptions of creativity and innovation in general, and their perceptions and experiences of fostering creativity and innovation in gifted students in K-12 settings, specifically.

The results of this study indicated that these gifted education educators had accurate, positive perceptions of creativity and innovation that were consistent with recent explicit theories of creativity and innovation. Participants also possessed a deep understanding of the importance and benefits of fostering creativity and innovation in gifted students. Although participants felt prepared to foster creativity and innovation, they indicated that they still faced certain barriers to doing so within their school systems.

These barriers include schools and school districts putting too much emphasis on grades and standardized testing, and the negative perceptions of administrators and other educators concerning the value of creativity. Participants did, however, see hope for cultivating students' creativity in the future. They noted that STEAM education and access to advanced technology in schools had the potential to lead to greater administrative support for developing the creativity and innovation of not only gifted students, but all students. In addition, findings suggested that supportive school leaders and more professional learning for teachers and principals on topics directly and indirectly related to creativity and innovation could play critical roles in fostering students' creativity and innovation in schools.

*Keywords: Creativity, Innovation, Giftedness, Gifted and Talented Students, Phenomenological Inquiry, STEAM education, Technology, Gifted Education, Creativity Training.*

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## CHAPTER I

### INTRODUCTION

In our rapidly changing world, there is growing interest in developing the creative thinking abilities of students. Developing creativity is increasingly viewed as necessary in education (Florida, 2002; Sawyer, 2006; Skiba, Tan, Sternberg, & Grigorenko, 2010; Trilling & Fadel, 2009). Creative-thinking skills often enhance problem-solving ability, motivation, affect, and can lead to more successful life outcomes (Hennessey & Amabile, 2010; Plucker, Beghetto, & Dow, 2004). Creativity should be promoted at all levels of the learning process (Gross, 2016; Renzulli, 2005). Many researchers have emphasized the importance of fostering creativity skills in students as a critical element of 21st century education. For example, Sternberg and Lubart (1995) suggested that any natural talent in the creativity domain that students possess should be encouraged so that they will develop into creative adults who solve problems in new, original, and effective ways and as a result, become productive members of society. Indeed, the future success of students is one of the leading forces that has driven society's growing interest in creativity (Craft, 2003a).

Facilitation of creativity is deemed by many gifted education researchers as a fundamental aspect of the learning process for gifted students (Pfeiffer, 2016; Renzulli, 2005; Renzulli & Reis, 1997). It is a central component of many theories of giftedness. For example, in his Three-Ring Conception of Giftedness Renzulli (1986, 2005), described creativity as an important grouping of three clusters of traits that are necessary

to the development of gifted behavior: above-average ability, creativity, and task commitment. Gagné (2005) also viewed creativity as one domain in the Differentiated Model of Giftedness and Talent (DMGT). The DMGT conceptualizes gifts as aptitudes in at least one of the following areas: intellectual, *creative*, sensorimotor, and socioaffective (Gagné, 2005). Sternberg (2006) also included creativity in the WICS Model of Giftedness, conceptualizing giftedness as a synthesis of wisdom, intelligence, and creativity. In addition, creative potential is prevalent in and a key element of many other definitions of giftedness (Runco, 2004). The widely used definition of giftedness, proposed by the U.S. federal government in 1972, viewed creative thinking as an element of giftedness (Marland, 1972). Currently in the United States, out of 47 states that have developed a definition of giftedness, 27 of them mention creativity as a part of that definition. For example, Colorado includes “creative” or “productive thinking” as an area of giftedness (Colorado Department of Education [CDE], 2016). Piske et al. (2017) suggests that the inclusion of creativity in the educational environment helps gifted students overcome certain social and emotional difficulties in schools and assists them in developing better self-esteem. Unfortunately, the lack of support for creativity in schools is seen as a cause of underachievement in many gifted students (Kim, 2008).

Educators play a crucial role in nurturing creativity in the classroom and their engagement in that role is influenced by their perceptions of creativity (Bramwell, Reilly, Lilly, Kronish, & Chennabathni, 2011; Sawyer, 2012). To effectively embed creativity into schools and classrooms, it is necessary to develop an accurate understanding of educators’ perceptions of creativity (Skiba et al., 2010). Several researchers have indicated that educators’ perceptions affect their practices with regard to encouraging

creativity in their students (Davies et al., 2013; Sak, 2004). Understanding educators' perceptions of creativity and their experiences regarding how to effectively cultivate students' creativity in K-12 school settings would put policymakers and educators in a better position to encourage creativity in schools (Cheung, 2012). As creativity is seen as an important component in various theories and definitions of giftedness, gifted education educators are more likely to understand the concepts of creativity and innovation, have positive perceptions about it, and embrace opportunities to foster creativity and innovation for gifted students in schools.

### **Problem Statement**

Scholars of creativity over the past quarter century have made significant advancements in their understanding of creativity, so that they now have a clearer picture of what creativity is, what it is not, and how to best foster it (Plucker, 2016). However, studies show that educators may have perceptions that run counter to researchers' explicit theories of creativity (Dawson, Andrea, Affinito, & Westby, 1999; Skiba et al., 2010; Westby & Dawson, 1995). A systematic review of the literature about teachers' perceptions of creativity indicated a need to conduct an in-depth, qualitative investigation of educators' perceptions of creativity and how their perceptions relate to practices in classroom contexts (Mullet, Willerson, Lamb, & Kettler, 2016). It is also important to explore educators' experiences related to fostering creativity and innovation within the school context. Plucker et al. (2004) asserted that, in spite of advancements in our understanding of creativity, educational strategies for fostering creativity have failed to keep pace with these new findings. Educators may have difficulties cultivating student creativity as a result of the prominence of standardized assessment practices that may

promote intellectual conformity in schools rather than innovation (Kim, 2008). When teachers must meet narrow standards of accountability, this may diminish how creativity is valued in schools (Sternberg, 2006). However, conformity in education in fact does not necessarily work against creativity (Beghetto, 2016). Conformity in schools can help students acquire relevant knowledge regarding a specific domain and that relevant knowledge can be seen as an important component of creativity (Amabile, 2012). Therefore, we can be optimistic that creativity can also be fostered in the educational system that promotes conformity. However, regarding how educators approach creativity in schools, Makel (2009) asserted there is a disconnect between theory and practice regarding cultivating students' creativity. This disconnect has, in part, resulted in the generation of only a few research-based, practical approaches that teachers can use to foster creativity. Having a rich understanding of how educators perceive and experience creativity and innovation in schools seems to be a crucial initial step needed in order to help gifted education teachers nurture gifted students' potential to be creative and innovative in schools. Skiba et al. (2010) asserted that understanding educators' perceptions of creativity must precede efforts to develop student creativity in schools.

### **Purpose of the Study**

It is necessary to develop an accurate understanding of educators' perceptions of creativity in order to inform practices of how to effectively incorporate creativity in K-12 school settings (Mullet et al., 2016; Skiba et al., 2010). Given the need for a deep understanding of educators' perceptions of creativity and innovation and the growing interest in creativity and innovation as important skills for the development of gifted behavior, it is necessary to attempt to understand how gifted education educators perceive



and experience the phenomenon of cultivating creativity and innovation in general and within school contexts. Therefore, the purpose of this study was to better understand gifted education educators' perceptions and experiences of fostering creativity and innovation for gifted students in K-12 settings.

In order to explore this topic, two general research questions guided the study:

- Q1 How do gifted education educators perceive creativity and innovation in general?
- Q2 What are gifted education educators' perceptions and experiences with creativity and innovation in K-12 settings?

### **Researcher's Stance**

To minimize biasing participants' perceptions and experiences of the phenomenon under examination, researchers should set aside their experiences of the phenomenon; this process is called "*bracketing*" in phenomenology (Creswell, 2013). Bracketing helps the researcher become aware of his or her related experiences, personal biases, assumptions, and viewpoints prior to interviewing the study participants (Merriam & Tisdell, 2016). Researchers who embrace this practice begin their projects by describing their own experiences and views of the phenomenon before proceeding with examining the experiences of the participants (Creswell & Poth, 2018). It is important, however, to note that complete bracketing is never possible (Colaizzi, 1978). Therefore, I identified my past experiences and views of creativity and innovation to help me set them aside so as to limit their influence during data collection, data analysis, and when writing the results.

I first became interested in education as a secondary school student. The education system at the school I was attending was knowledge-based and provided

students with only fixed content in different areas of study (e.g., Math, History). Creativity was not welcome at the school at any level. The school considered creativity-relevant skills and activities as obstacles that caused students to deviate from the main goal of the program: to simply memorize and understand the fixed curriculum. Sadly, many of my friends who were bright and creative students found the school climate neither engaging nor challenging. In fact, I was shocked when a talented friend of mine withdrew from school out of frustration with this situation. I remembered one day when I proposed to the Math teacher a different way to solve a math problem in the classroom; that teacher's response was: "We have to follow and only focus on the solution presented in the textbook." I, personally, was a high achiever from as early as the elementary level; a student who was honored several times by the region's prince as one of the top students in the region. However, in my secondary level, I began losing interest in my studies when I found my instructors were not engaging and welcoming of creativity. At this point, I became more interested in some creative activities that were not supported at the school at any level (e.g., film-making, programming, creative problem-solving activities, design, and photography). As a result, my achievement level dropped dramatically. Thereafter, all of these experiences influenced my interest in the great opportunity to pursue my studies in gifted and talented education: to help students to feel appreciated in schools and to help ensure their creativity and talents could be fostered by their programs.

My knowledge about creativity and innovation only intensified as I began my doctoral studies by exploring the research and explicit theories of creativity, which affected how I view and understand creativity and innovation. I believe supporting creativity and innovation in schools is important for the talent development of gifted

students. Supporting creative thinking in schools also has the potential to make school environments enjoyable, engaging, and challenging for gifted students. It is not an easy task to foster creative productivity in the classrooms, since this requires that teachers pay attention to each student's individual interests, which may vary widely among students even in one classroom. However, educators can create a positive environment for creativity and innovation by promoting creative thinking. Educators should be trained to recognize students' creative behavior and encourage it. I view creativity, in general, as the ability to produce a high-quality, valuable, novel, and appropriate (useful) behavior or idea that is evaluated or defined within a social context. Innovation is a subset of creativity that is about turning the creative idea or behavior into a successful product or outcome. There is no specific systematic way for educators to foster creativity and innovation in schools. However, it is my opinion that teachers should explore the nature of creativity and educate themselves regarding current views on creativity, which could help them support creativity for gifted students in a more meaningful way. For example, many theories of creativity emphasize the importance of intrinsic motivation for students to get involved in creative tasks, so if educators ignore this part and focus heavily on extrinsic motivation – which may ignore children's different areas of interests -- that would then result in a failure to successfully foster creativity and innovation. I believe teachers are the cornerstone of each child's educational experience, people who can play a central role in fostering creativity for gifted students; therefore, their perceptions and understanding of creativity impact if and how they intentionally seek to develop it in their classrooms. Fostering creativity and innovation for gifted students is not just about the application of some activities or the slight modification of a teaching style to apply more

exciting creative techniques, rather it is recognizing the importance of building a creative environment that respects what each student is passionate about. I believe promoting creativity and innovation in gifted students is essential to the development of 21st century skills. However, I recognize that it is not an easy task for educators as they may face challenges pursuing this mission.

### **Overview of Research Methodology**

The purpose of this study was to better understand gifted education educators' perceptions and experiences of fostering creativity and innovation for gifted students in K-12 settings; therefore, a qualitative research approach is most appropriate for this study. Bogdan and Biklen (2007) described the overall goal of qualitative research as follows: to understand, describe, and discover the meaning that individuals construct and their explanations of this meaning. Therefore, the study's research questions are best answered by utilizing qualitative research methods. This study employed a phenomenological research design as the methodology to gain a rich understanding of gifted education educators' perceptions and experiences of creativity and innovation and how to foster these qualities in gifted students. Phenomenology "describes the common meaning for several individuals of their lived experiences of a concept or a phenomenon" (Creswell & Poth, 2018, p. 75).

Crotty (1998) recommended social researchers examine the philosophical foundation to help confirm the soundness of the research and produce convincing outcomes. In this research, I followed the epistemology of constructionism that states that "meaning is not discovered but constructed" (Crotty, 1998, p. 42). Constructionism claims that "meanings are constructed by human beings as they engage with the world

they are interpreting” (Crotty, 1998, p. 43). I also followed the theoretical perspective of interpretivism that offers a framework that helps to explain human social reality and to understand different perspectives (Crotty, 1998). From this perspective, the beliefs the researcher holds in the process of conducting the research are about reality not being an objective concept, but rather one that is constructed by individuals based on their perspectives and experiences. The phenomenon of fostering creativity and innovation is complex and multifaceted, so there is no single meaning and reality behind it; our understanding of this phenomenon is continuing to evolve over time. For the purpose of this study, meanings were co-constructed between the participants and the researcher as the researcher was involved throughout the research process by asking questions and interpreting the participants’ responses (Hatch, 2002). Creswell and Poth (2018) asserted that the typical data collection procedure in phenomenological research involves conducting interviews with individuals who have experienced the phenomenon. Thus, the main method used to collect data for this phenomenological study was one-on-one, in-depth, semi-structured participant interviews.

### **Significance of the Study**

Given the important role creativity and innovation are believed to play in the development of gifted behavior and 21st century skills, researchers and educators are urged to work towards the development of educational practices and environments to foster creativity and innovation in schools. However, as creativity and innovation are complex constructs, it is important to first understand educators’ perceptions and experiences in order to improve current educational practices and have a better understanding how educators view this phenomenon within the K-12 settings (Mullet et

al., 2016; Skiba et al., 2010). A systematic review of the literature of teachers' perceptions of creativity by Mullet et al. (2016) demonstrates the need for in-depth qualitative investigation of teachers' perceptions of creativity as they relate to the school context. This study aimed to enrich the literature by providing a deep understanding of gifted education educators' perceptions of creativity and innovation, as their perceptions may directly affect the educational practices of promoting creativity and innovation for gifted students in schools. The current study also investigated gifted education educators' experiences regarding fostering creativity and innovation for gifted students in k-12 settings. The results of this study may help other researchers build upon these findings by developing a set of current best practices related to fostering creativity and innovation in K-12 schools. In addition, understanding gifted education educators' perceptions of and experiences with creativity and innovation in schools may enhance' training for educators on this topic and lead to the revisioning of current educational policies at the school and district levels to help ensure this topic is meaningfully addressed in K-12 schools.

### **Delimitations**

Research delimitations are defined as the potential weaknesses found in a study that are outside the researcher's control, but that may affect the study outcomes (Creswell, 2009). One of the primary delimitations of this study was the use of a qualitative phenomenological approach that limits the ability to generalize the study findings (Creswell, 2009). This qualitative approach concentrated on a deep understanding of the phenomenon under examination, which usually requires that only a small number of participants be included. In addition, the study only included gifted

education educators through the application of the specific inclusion criteria; although this might be seen as a factor that reduces diversity among the study's sample, it could lead potential participants who did not meet the criteria to be excluded from this study. Another delimitation was the researcher's personal and deep understanding of the concept of creativity, which may result in bias during the study. To mitigate researcher bias, my researcher's stance was presented, and an outside reviewer was sought to assist with verifying the data and results.

### **Key Terminology**

**Constructionism**—An epistemological view that perceives meaning as “not discovered but constructed” (Crotty, 1998, p. 42). Constructionism also states that “meanings are constructed by human beings as they engage with the world they are interpreting” (Crotty, 1998, p. 43).

**Creativity**—The ability to produce novel and appropriate ideas or outcomes as defined within a social context (Beghetto & Kaufman, 2007; Plucker et al., 2004).

**The Four P's Theory of Creativity**—Rhodes' Theory (1961) that posits there are four fundamental facets of creativity. This theory of creativity distinguishes the creative person, process, press (environment), and product. This model helps researchers study smaller, more manageable aspects of the larger, multifaceted concept of creativity.

**Gifted and Talented Students**—There is no one universal definition of gifted and talented students, but the definition proposed by the U.S. federal government in 1972 is a very widely used one. This federal definition has been developed and

modified several times since then and the recent definition defined gifted and talented students as:

Students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services and activities not ordinarily provided by the school in order to fully develop those capabilities (U.S. Dept. of Education [USDOE], 2015, Section 9101 (22)).

Many states and districts base their definition of gifted and talented students on the federal definition, although they are not required to use it (National Association for Gifted Children [NAGC], n.d.).

**Innovation**—A subset of creativity that refers to the successful product of a creative idea or behavior (Treffinger, Schoonover, & Selby, 2013).

**Interpretivism**—A framework that helps to explain human social reality and to understand perspectives (Crotty, 1998). Interpretivism tends to depend on the perspectives of the individual that is influenced by the individual's experiences.

**Perception**—Refers to the processing of information received from the senses; this sensory information is identified, organized, and interpreted by the complex nervous system to make sense of the world around the individual (Pedersen, 2018).

**Phenomenology**—An approach of qualitative research that “describes the common meaning for several individuals of their lived experiences of a concept or a phenomenon” (Creswell & Poth, 2018, p. 75). The typical data collection procedure in phenomenological research is conducting interviews with individuals who have experienced the phenomenon under study (Creswell & Poth, 2018).



## CHAPTER II

### REVIEW OF THE LITERATURE

There have been significant advancements in scholars' understanding of creativity over the past quarter century to the point where we now have a better conceptualization of what creativity is, what it is not, and how to foster it (Plucker, 2016). However, research indicates that educators may have perceptions that run counter to scholars' explicit theories of creativity (Dawson et al., 1999; Skiba et al., 2010; Westby & Dawson, 1995). This literature review investigated theories and theoretical discussions about scholars' explicit theories of creativity, how to foster creativity, and teachers' perceptions of creativity.

The beginning of the literature review includes a section on creativity and giftedness followed by definitions of creativity and innovation. Next, a theoretical review is presented concerning scholars' explicit theories of the multifaceted construct of creativity. This theoretical review is framed in four main sections based on the Four P's Theory of Creativity by Rhodes (1961) that posited there are four fundamental facets of creativity: The creative person, process, press, and product. This section began with literature related to the creative person, then explored the creative process, followed by a discussion of the creative press (environment), and ended with an examination of the research on the creative product (innovation).

The creative person section introduces several theories that describe the creative person. It also reviews scholars' explicit theories about the development of creativity in

individuals, followed by a discussion of the traits of creative giftedness. Assessment of creativity in individuals is also covered, including self-assessment and assessment by others (e.g., parents, teachers).

The creative process section provides an overview of several models and theories that describe the creative process. In addition, this section provides a review of empirical research that has examined techniques to foster student creativity. This section also describes assessment tools that focus on the measurement of the creative process (e.g., Torrance Test of Creative Thinking).

The creative press (environment) section provides a review of social-environmental conditions that may foster or inhibit creativity. Social environments include family and school environments. Empirical research on creative learning spaces, areas of interest in the learning environment, the relationship between the use of time and the promotion of creativity, and accessibility to resources and materials that support creativity are also discussed. This theoretical review concludes with a discussion of literature focused on the creative product (innovation), including a description of the characteristics of the creative product and assessment techniques of the creative product. Following the comprehensive theoretical review of creativity is a synthesis of empirical studies that have investigated teachers' perceptions and understanding of creativity in K-12 settings.

### **Creativity and Giftedness**

Creativity is deemed by many gifted education researchers as a fundamental aspect of the learning process for gifted students (Pfeiffer, 2016; Renzulli, 2005; Renzulli & Reis, 1997). Piske et al. (2017) suggested that the inclusion of creativity in the

educational environment seems to help gifted students overcome some social and emotional difficulties in schools and assists them in developing better self-esteem. Unfortunately, the lack of support for creativity in schools is seen as a cause of underachievement in many gifted students (Kim, 2008).

Creativity has long been seen as a component of giftedness. Many definitions of giftedness include creativity as a key element. The widely used definition of giftedness, proposed by the federal government in 1972, viewed creative thinking as one of the following six areas of giftedness: general intellectual ability, *creative or productive thinking*, specific academic aptitude, visual and performing arts, leadership ability, and psychomotor ability (Marland, 1972).

In addition, creativity is a central component of many theories of giftedness. For example, in his Three-Ring Conception of Giftedness, Renzulli (1986, 2005) describes giftedness as a result of the interaction of three clusters: above-average ability, *creativity*, and task commitment; this interaction is essential to the development of gifted behavior. Gagné (2005) also views creativity as one domain in the Differentiated Model of Giftedness and Talent (DMGT). The DMGT conceptualizes *gifts* as the aptitudes in at least one of the following areas: intellectual, *creative*, sensorimotor, and socioaffective (Gagné, 2005). Sternberg (2006) also includes creativity in the WICS model, conceptualizing giftedness as a synthesis of wisdom, intelligence, and *creativity*.

Further, numerous state definitions of giftedness include creativity as a component. Stephens and Karnes (2000) studied states' definitions of giftedness almost two decades ago and found that many states included creativity as an element in their definitions. Currently, out of 47 states that provide definitions of giftedness, 27 of them

mention creativity as part of giftedness. For example, Colorado notes several areas of giftedness, including *creative or productive thinking* (Colorado Department of Education [CDE], 2016).

### **Defining Creativity and Innovation**

As creativity is a complex construct, researchers found it a daunting task to come up with an inclusive definition of it. Creativity researchers from a variety of disciplines have viewed it from different perspectives; these researchers primarily work in the fields of education and psychology. Thus, creativity is a broad term that is applied somewhat differently in different fields, and no universal definition of the word has emerged. In fact, a variety of definitions of creativity can be found even within a single field. For instance, in psychology, Franken (1994) defined creativity as “the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others” (p. 396). Another researcher in psychology, Hirschman (1980), defined creativity as “the capacity to generate novel cognitive content” (p. 285).

Within the field of gifted education, Torrance (1974) put forth an extensive definition of creativity that posits what creative people should be able to do. These skills include the following: (a) determine the difficulties in a given situation; (b) be sensitive to the problems that exist; (c) search for solutions; (d) hypothesize about deficiencies; (e) make predictions; and, (f) ultimately select and apply one solution among many, after trial and error, that is most likely to yield positive results. Multiple components of creativity, based on different levels (individual, group, and societal), were proposed by Sawyer (2006). At the individual level, Sawyer stated that two kinds of creativity exist,

the “small c” creativity and the “big C” Creativity. The small “c” creativity is defined as the ability to generate something new in routine activities. On the other hand, the big “C” Creativity refers to a person being able to generate products that are socially valuable, to solve significantly complicated problems. Generally, while “small c creativity” focuses on the efforts produced by the broader population, “big C Creativity” focuses on the work generated by distinguished, prominent individuals (Sawyer, 2006). In relation to this, Kaufman and Beghetto (2009) went further than identifying only two levels of “C,” looking at creativity in a broader way that introduced four levels of “C” (big, pro, little, and mini). At the group level, creativity is defined by Sawyer (2006) as the ability to work collaboratively in generating appropriate and novel products through interactions among group members. The third level of creativity, the societal level, refers to the ability of a society to produce a new system that benefits the whole society and all its members.

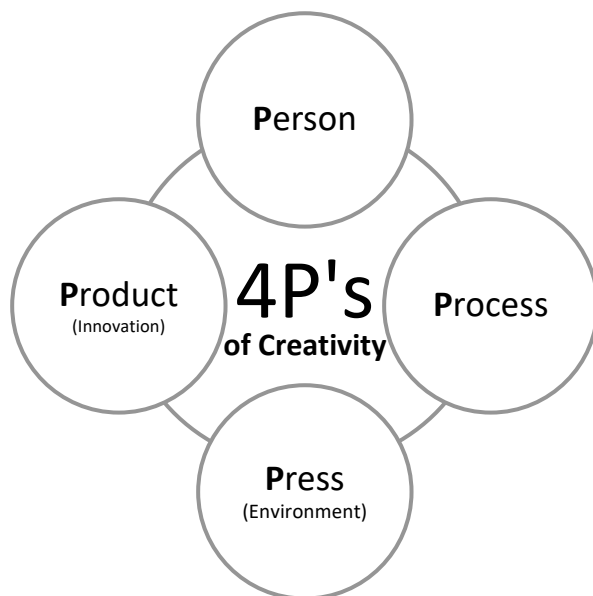
Plucker et al. (2004) stated that the lack of a widely agreed-upon definition of creativity limits the implementation of creativity in schools. In general, scholars’ definitions of creativity focus on one or more of four major categories: Creative products, personal creativity, the creative process, and the environment that fosters creativity (Runco, 2004). Therefore, while some researchers focus primarily on creativity as an ability, others look at the creative process that leads to creative outcomes or view creativity in terms of the products that result from creative behavior. Researchers who focus on creative products frequently use the term “innovation” rather than creativity, referring to innovation as the practical application of creative thinking (Treffinger et al., 2013). Isaksen, Dorval, and Treffinger (2011) view innovation as “the commercialization

of new ideas” (p. 13). Innovation seems to be a subset of creativity that refers to the product of the creative behavior (Treffinger et al., 2013). To be considered creative, ideas and products must be novel and appropriate (Beghetto & Kaufman, 2007). To encapsulate, creativity, in general, is the ability to produce novel and appropriate ideas or behaviors as defined within a social context, and innovation is a subset of creativity that refers to the successful creation of a product that is influenced by a creative idea or behavior. As creativity and innovation are seen as closely related constructs, several scholars also add *imagination* as another very close construct related to creativity and innovation, and as an aspect of creative cognition (Beghetto, 2014; Forgeard, & Kaufman, 2016; Ward, 1994). Imagination comes at the beginning of the process that refers to mental representations of ideas or things that take time to present to the senses (Markman, Klein, & Suhr, 2009). Regarding the definition of creativity within the school context, the creative outcome must be new, but the question is: New to whom? Starko (2014) suggests that the creative product within the school context is considered novel when it is new to the creator (e.g., student) and/or the school context, although it might not be considered original in the larger community. In other words, an elementary student might come up with a product that is new and exciting to him or her, but that is not considered novel to some adults (e.g., teachers, parents). Validating creative ideas that are novel to students, whether or not they are novel to adults or to the community at large, is critical to developing and promoting creativity and innovation in schools.

### **Theoretical Framework**

Early in the 1960s, Rhodes examined the research on creativity in order to formulate a theory to describe and understand this multifaceted construct (Rhodes, 1961).

The results of Rhodes' examination revealed the Four P's Theory of Creativity which posits there are four fundamental facets of creativity (see Figure 1). The four P's theory of creativity distinguishes the creative person, process, press (environment), and product. This model helps researchers study smaller, more manageable aspects of the larger, multifaceted concept of creativity.



*Figure 1.* The Four P's Theory of Creativity by Rhodes (1961).

The Four P's Theory of Creativity is used as the theoretical framework for this study in which creativity will be explored and viewed through the four facets of creativity mentioned in this theory. Although creativity will may be viewed through these separate lenses, it should be noted that there is overlap between Rhodes' four P's. MacKinnon (1978), who later adopted this model, demonstrated that the four facets of creativity cannot operate independently; they interact together as an entire system. For example, if an individual has personality traits that support the development of creativity, but is

missing a supportive environment, he or she will find it difficult to process and produce creative ideas or products. Therefore, creativity may result from an interaction between the Four P's.

### **The Creative Person**

Are there common traits among creative people? The first “P” in the Four P's Theory of Creativity refers to the creative person. For decades, researchers have tried to study creativity by understanding and describing the creative person. Feist (1998) conducted a meta-analysis of creative people and concluded that empirical studies over about 50 years supported the concept that creative people can be distinguished from others – that such individuals behave consistently over time. As many theories have viewed creativity through the development of creative ideas and products, several theories have explored the personalities of creative individuals that lead them to produce creative products. This section will introduce some theories related to the creative person. It will also review scholars' explicit theory about the development of creativity in individuals, followed by a discussion of the traits of creative giftedness. Assessment of creativity in individuals will also be covered, including self-assessment and assessment by others (e.g., parents, teachers).

### **The Investment Theory of Creativity**

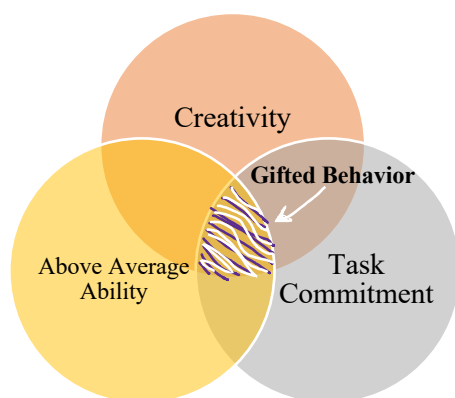
In their Investment Theory of Creativity, Sternberg and Lubart (1995) defined creative people as those who are able to convert previously unknown ideas into novel ideas that are valuable to society. Such ideas usually encounter resistance when they are first presented; however, creative individuals persist and eventually such ideas or products become popular and valued (Sternberg & Lubart, 1995). Creative thinkers,



according to the Investment Theory, need to have knowledge, personality traits (e.g., willingness to overcome obstacles and to take sensible risks), intellectual ability (e.g., the synthetic skill to see problems in new ways), motivation, styles of thinking (e.g., a legislative style), and a supportive environment (Sternberg, 2006).

### **Three-Ring Conception of Giftedness**

Another theory that focuses on creativity as an important cluster in gifted behavior is the Three-Ring Conception of Giftedness by Renzulli (1986, 2005). Renzulli recognized two distinct categories of giftedness: creative-productive giftedness and schoolhouse giftedness. The Three-Ring Conception concentrates on cultivating creative-productive giftedness; however, both types of giftedness are important as these two types often interact (Renzulli, 2005). In his Three-Ring Conception of Giftedness, Renzulli (1986, 2005) posits that for a gifted individual to produce gifted behavior, he or she needs to have an appropriate interaction among three basic clusters: above-average ability, task commitment, and high levels of creativity (see Figure 2). Each characteristic plays a major role in helping gifted individuals to develop gifted behavior and thereby, make meaningful contributions to society (Renzulli, 1986).



*Figure 2.* Renzulli's (1986, 2005) Three-Ring Conception of Giftedness.

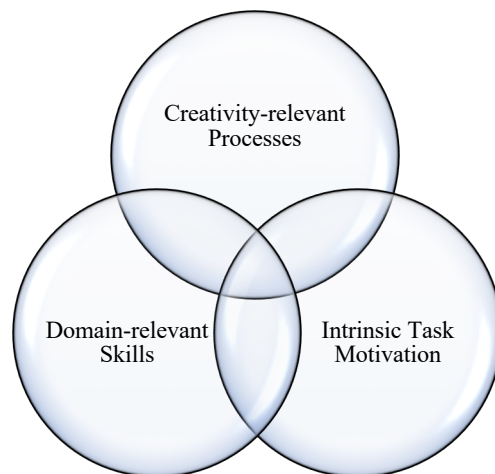
Each of the three clusters of human traits that each gifted individual needs in order for creative production to result is comprised of several characteristics. Above-average ability includes general and specific ability. General ability includes the following: (a) adaptation to novel situations, (b) high levels of abstract thought, and (c) accurate and rapid retrieval of information. Further, specific ability consists of: (a) the capacity to distinguish relevant information from irrelevant information, (b) the use of general abilities in application to a particular area of knowledge, and (c) the capacity to use strategies and acquire advanced knowledge while pursuing a problem (Renzulli & Reis, 1997).

Task commitment, the second trait, includes the following characteristics: (a) a capacity for hard work in a specific area; (b) high levels of enthusiasm and interest; (c) having the self-confidence to achieve; (d) the ability to set high standards for one's work; and, (e) the ability to recognize important problems within an area of study (Renzulli & Reis, 1997). The third trait, creativity, includes: (a) flexibility, fluency, and originality of

thought; (b) being curious; (c) willingness to take risks; (d) being open to new ideas and experiences; and (e) having a sensitivity to aesthetic characteristics (Renzulli & Reis, 1997).

### **The Componential Theory of Creativity**

Amabile's Componential Theory of Creativity is also built on a three-part conceptualization of creative performance that states creative individuals need to generate creative products/ideas. In addition to the three personal variables, this theory also views the social environment as a necessary variable for creativity (Amabile, 2012). In this theory, for an individual to produce a creative idea or product, he or she must have high levels of intrinsic motivation, high levels of domain expertise, and high levels of creative thinking skills; and, the individual should work in an environment that is highly supportive of creativity (see Figure 3). This theory aims to explain how the components of creativity influence the creative process (Amabile, 2012).



*Figure 3.* Amabile's Componential Theory of Creativity (2012).

The first component -- creativity-relevant processes -- includes personality characteristics and cognitive processes. The personality characteristics are (a) risk-taking; (b) conducive to independence; (c) self-discipline; (d) having new perspectives on problems; (e) tolerance for ambiguity; and, (f) disciplined skills and work style in producing ideas. (Amabile, 2012).

The second component -- domain-relevant skills -- includes (a) technical skills, (b) knowledge, (c) expertise, and (d) talent in the particular domain in which the creative person is working (e.g., electrical engineering, product design). The domain-relevant skills comprise the raw materials that the individual uses throughout the creative process to create possible responses, and the expertise the creative person need to evaluate the viability of response possibilities (Amabile, 2012).

The third component that the creative person needs to possess is intrinsic task motivation; in other words, they need the motivation to solve a problem or undertake a task because it is interesting, personally challenging, involving, and/or satisfying. This intrinsic motivation component is different from the extrinsic motivation that arises from competition, rewards, and completing work to someone else's rigid expectations (Amabile, 2012). As in all previously mentioned theories of creativity, intrinsic motivation is also a central principle of creativity in the Componential Theory of Creativity.

### **The Development of Creativity in Individuals**

Several researchers have examined the idea of whether or not creativity can be learned and fostered or if it is always only an innate ability (e.g., Omdal & Graefe, 2017). The research has also examined the possibility of whether or not every person can

improve his or her creativity skills (Hokanson, 2006; Karpova, Marcketti, & Barker, 2011; Scott, Leritz, & Mumford, 2004). Çetinkaya (2014) asserted that people are born with different inherited characteristics that affect creativity and intelligence. However, others propose that the characteristics of creativity and intelligence could be developed since they are not stable (Çetinkaya, 2014; Sternberg & Grigorenko, 2002). Similarly, Sahin (2014) asserted that individuals are born with either more or less creative thinking ability; yet, he also emphasized that all can learn creative thinking. Similarly, Gomez (2007) mentioned that, in spite of the fact that some individuals can be more creative than others, every individual has the potential to be creative. In his theory of creativity and problem-solving, Guilford (1967) suggested that gifted talent could be developed by fostering creative thinking. Although creativity is considered a primary cluster that leads to produce gifted behavior, as Renzulli (1978) mentioned in his respected Three-Ring Model of Giftedness, a very strong belief among scholars of creativity supports the notion that all people, both gifted and non-identified, can be creative and can improve their creative thinking skills.

### **Traits of Creative Giftedness**

Researchers have presented many characteristics and traits that creatively gifted individuals have in common. Clark (2008) divided giftedness traits into four areas: cognitive, affective, behavioral, and creative. However, it is uncommon for gifted learners to exhibit traits in every area. Such lists of characteristics may help to better understand gifted individuals. Creative traits may include: flexibility in thinking, independence in attitude and social behavior, openness to stimuli, self-acceptance, intuitiveness, commitment to self-selected work, and a lack of concern regarding social

norms (Clark, 2008). Positive affect is also an important trait that supports creativity. Hennessey and Amabile (2010) mentioned that many experimental studies on creativity connected positive affect with higher levels of creativity. Positive affect facilitates intrinsic motivation, problem-solving, and flexible thinking (Aspinwall, 1998). Many assessments of creativity in individuals include a number of these common characteristics.

### **Assessment of Creativity in Individuals**

Given creativity is a complex construct, there are different approaches to assess it. Some assessment strategies and tools focus on the creative process, while others focus either on creative products or the personality traits of creative individuals. The assessment of individual traits of creativity may include the following: personality characteristics, creativity-relevant abilities, motivation, intelligence, emotional intelligence, thinking styles, or knowledge (Kaufman, Plucker, & Russell, 2012). Creativity can be evaluated through self-assessment or assessment by others who have enough knowledge of the individual to provide an accurate picture of their potential in this area. These types of methods that focus on the creative person consider creativity as domain-general and do not provide different criteria for specific subject areas.

**Self-assessment.** Self-assessment is a practical way to assess creativity. Using this method, individuals are asked to judge their own creativity. The literature reveals various scales that can be used for the purpose of self-assessment of creativity. One of the main scales that focuses on personality is the Five-Factor Theory Scale (Costa & McCrae, 1992). This scale establishes five aspects of personality: (a) emotional stability, (b) openness to experience, (c) agreeableness, (d) extraversion, and (e) conscientiousness.

Examples of items in the subscale “openness to experience” are: “I spend time reflecting on things” and “I have a big imagination” (Costa & McCrae, 1992). Similarly, there is a group of scales that concentrates on assessing the person’s creative style based on the ways in which he/she applies creativity (Selby, Treffinger, Isaksen, & Powers, 1993). An example of this scale is the Kirton Adaption-Innovation Inventory (Kirton, 1999).

A different way of self-assessing creativity is through creative behavior checklists; in such self-report assessments, the individual provides information that aligns with certain creative behaviors. This type of assessment asks individuals to rate their past or current creative accomplishments (Kaufman et al., 2012). An example of this type of assessment is the Creative Behavior Inventory by Hocevar (1981). This checklist-based scale consists of 90 items that assess creative behavior in different areas (i.e., art, performing arts, crafts, music, math, and science; Hocevar, 1981).

**Assessments by others.** This method requires others such as parents, teachers, or peers to evaluate the creativity of the person. This method can be as simple as teachers ranking students based on their implicit beliefs of creativity and/or knowledge of the student (Kaufman et al., 2012). As with self-assessments of creativity, methods under this type of assessment consider traits and abilities related to creativity that are domain-general and not domain-specific. Kaufman et al. (2012) asserted that the raters (e.g., parents, teachers, peers) of these types of methods need to be experts in the child’s characteristics, not experts in creativity. There are a variety of different scales that fall under this type of assessment. Creativity checklists are commonly used in assessments conducted by others; examples of these include the Creativity Checklist (Proctor & Burnett, 2004) and the Gifted Rating Scales (Pfeiffer & Jarosewich, 2007). The variety

of techniques used to measure personality traits and creativity-relevant abilities demonstrates the complexity of assessing creativity in children.

### **The Creative Process**

The second “P” refers to the creative process, which represents the actual experience that leads people to become creative (Kaufman, Plucker, & Baer, 2008). The creative process typically consists of using techniques and strategies that may lead to the production of creative products and ideas. During the creative process, the creative person joins unrelated or even contrasting information together in a new way to come up with a novel product (Gabora, 2002). Throughout the creative process, it is important for creative individuals to see familiar things from different perspectives, which will sometimes lead them to break conventional ways of thinking (Prentice, 2000). Burnard and Younker (2004) posit that through the creative process, creative people overcome boundaries and limitations when attempting to solve a problem creatively. Sternberg (2003) states that creative people are creative because they decide to be creative; furthermore, the creative individual’s positive attitudes toward the process of creativity is an important part of the creative process. This section will provide an overview of several models and theories that describe the creative process. In addition, it will review some research that examined techniques for fostering creativity. This section will also describe assessment tools that focus on the measurement of the creative process (e.g., Torrance Test of Creative Thinking).

### **The Idea of Flow**

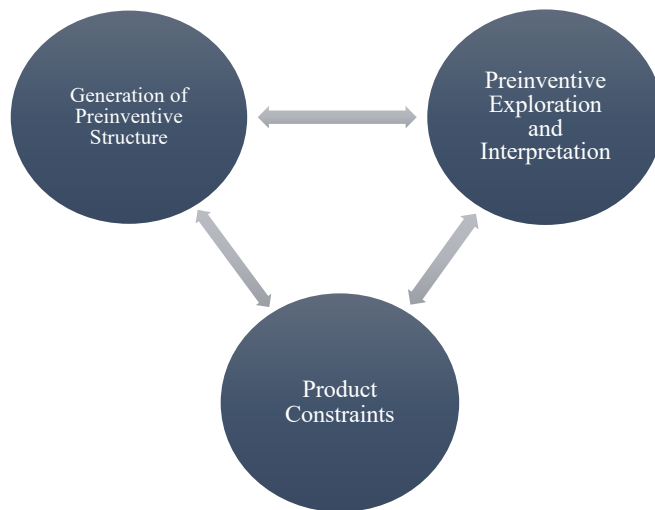
The moment when a creative individual is highly engaged in the creative process is often referred to as “flow” (Csikszentmihalyi, 1996). The idea of flow originated from



Csikszentmihalyi's (1996) study of the responses of creative people while they were engaging in creative tasks. To illustrate, creative individuals may experience flow when they are writing a computer program, solving a problem, or photographing a landscape. Among the nine elements that Csikszentmihalyi described as necessary for achieving flow, are the following: (a) challenge-skill balance; (b) clarity of goals; (c) concentration on the task; (d) immediate and clear feedback; (e) merging of actions and awareness; and (f) loss of self-consciousness (Fullagar & Kelloway, 2009). A balance between the skill of the performer and the challenge of the task must be struck to achieve the flow state (Csikszentmihalyi, 1996).

### **The Geneplore Model**

The Geneplore model by Finke, Ward, Smith, and NetLibrary (1996) states that the creative process alternates between two unique processes, generation and exploration. The words "generate" and "explore" were combined to create the name "Geneplore" (Finke et al., 1996). Geneplore offers a basis for understanding the cognitive processes that underlie creative thinking. This model has two phases, the generative process phase and the exploratory phase (see Figure 4). In the generative phase, the individual generates many different ideas and builds a pre-inventive structure of a possible creative solution. In the exploratory phase, the individual evaluates these possible ideas and selects the best one; it may take several cycles before the creative product is produced (Kaufman et al., 2008). The creative process during the generative phase is usually done unconsciously, while the creative process in the exploratory phase is seen as a conscious process (Finke et al., 1996).

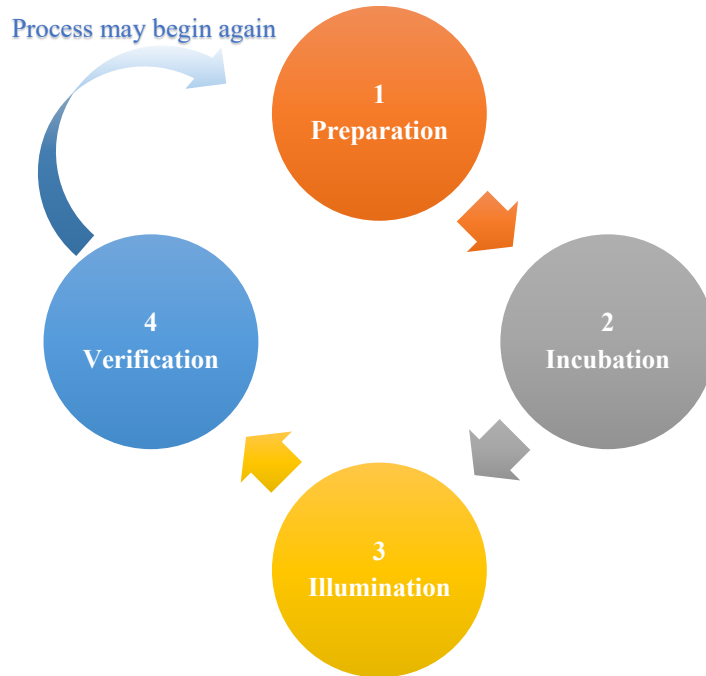


*Figure 4.* The Geneplore Model of Creative Process by Finke et al. (1996).

### **Stages of the Creative Process**

In 1926, Wallas put forth one of the first models to describe the creative process. Although this model was created long ago, it is still seen as one of the most popular ways to describe the creative process. Wallas (1926) divided the creative process into four stages: preparation, incubation, illumination, and verification (see Figure 5). First, in the preparation stage, a problem is defined and investigated through many lenses and criteria, which are used to verify the solution's acceptability. Second, the incubation stage consists of unconscious processing; the creative person steps back and takes time to contemplate the problem. No direct effort is expected during this stage. During the third stage, illumination, ideas arise that lay the foundation for a creative solution. In this stage, ideas move from preconscious processing into conscious solutions and answers (Wallas, 1926). Fourth and last is the verification stage. In this conscious stage, the creative ideas generated in the illumination stage are verified and elaborated upon to

demonstrate whether or not these ideas meet the criteria as defined in the preparation stage (Wallas, 1926). If criteria are not met, the process begins again.



*Figure 5.* Stages of Creative Process by Wallas (1926).

### **Techniques for Fostering Creativity**

Several studies have explored the effects of different techniques on fostering creative thinking (Duin, Baalsrud Hauge, & Thoben, 2009; Forster, 2009; Kilgour & Koslow, 2009; Koukourikos, Karampiperis, & Panagopoulos, 2014; Mokaram, Al-Shabatat, Fong, & Andaleeb, 2011; Riga & Chronopoulou, 2013; Shawareb, 2011). Kilgour and Koslow (2009) conducted an experimental study to examine the effects of divergent creative thinking techniques on the creative ideation process. This study involved students from a public university located in the Pacific Coast. Participants were divided into two groups, experimental and comparison. Participants in the experimental

group used divergent creative thinking techniques to generate ideas. Participants in the comparison group used convergent thinking techniques. The researchers provided judging criteria for experts to assess students in the two groups before and after the experiments. Findings demonstrated that divergent creative thinking techniques (techniques were not explicitly stated) enhanced the originality of students' creative ideation. In addition, the study suggested that creative thinking techniques should be varied, that they are not one-size-fits-all. A recommendation was made that such divergent thinking techniques should be tailored specifically to the individual and the situation in which the techniques are to be applied.

Additionally, Riga and Chronopoulou (2013) conducted a study using a quasi-experimental research design at a public kindergarten in Greece. The researchers developed a creative music program and examined whether the program fostered student creative thinking. The experimental group joined the program two to three times a week; during the same time period, the control group spent its time in an unstructured, free-play setting. The results indicated that providing some structured creative music activities for kindergarten students led to an increase in students' desires for creative experimentation and exploration.

**Technology-based techniques to foster creativity.** Some studies have examined various technology-based techniques to foster creativity and creative thinking skills. Shawareb (2011) examined the effect of early free computer practice on the creative thinking of kindergarteners in Jordan. The study utilized a quasi-experimental design to explore the effect of computer usage in school on the enhancement of young children's creative thinking skills. Children were divided randomly into groups. The experimental

group was provided with free daily access to computers. The control group received only the standard curriculum. The Arabic version of the Torrance Test of Creative Thinking (TTCT) was administered before and after the experimental condition. Pre-test scores did not demonstrate statistically significant differences between the two groups, while post-test scores indicated that statistically significant differences were found between the experimental group and the control group on the total creative thinking scores found on the dimensions of TTCT (i.e., Fluency, Elaboration, Originality). The researchers recommended providing children with free access to computers at a young age in order to provide them with more opportunities to foster their creative thinking skills.

Furthermore, Wood and Ashfield (2008) conducted a qualitative case study to better understand how technology can be used to enhance the creativity skills of visual learners. The sample was comprised of 137 students in five different elementary schools. The researchers conducted 10 observations of whole-class lessons, five literacy lessons and five math lessons, which utilized Interactive Whiteboard technology. Observations focused on student interactions during these lessons. Findings indicated that Interactive Whiteboards were helpful in enhancing the creativity skills of visual learners. Findings also showed that Whiteboard technology encouraged teachers to embed more creative activities in their classrooms (Wood & Ashfield, 2008).

**Creative techniques and programs that include gifted students.** Quite a few studies have examined techniques to promote creativity within the general student population. A smaller number of studies have concentrated on gifted students or compared one group of identified gifted students with another non-identified group. Çetinkaya (2014) conducted a quasi-experimental research study to determine the effect

of a creative problem-solving teaching program on the creative thinking skills of gifted students in Turkey. This study consisted of a total of 47 middle-school aged students divided into two groups, experimental and control. The TTCT was used to measure the creative thinking skills of both groups before and after the implementation of the creative problem-solving program. The pre-test scores revealed no significant difference between the two groups. Then, only the experimental group was provided with the problem-solving program. After the experimental group completed the program, the TTCT was again administered to both groups. Results indicated a statistically significant difference in creative thinking skills scores between the experimental and control groups. Findings from this study suggest creative problem-solving programs may be effective in promoting the creative-thinking skills of gifted students.

Further, Saygili (2014) conducted a descriptive research study with 100 gifted students and 102 non-identified students to investigate whether or not having gifted identification status increased creative problem-solving ability. Findings indicated that problem-solving activities were not just beneficial to identified gifted students. Rather, it was suggested that the enhancement of creative problem-solving skills may contribute to better decision-making on the part of *all* students – regardless of giftedness and intellectual capacity (Saygili, 2014). Although some students might benefit more from learning creative problem-solving activities to develop creative thinking skills, Saygili contended that *all* students have the potential to benefit whether they are identified gifted or not.

## Assessment of Creative Process

It is very common in the field of creativity to assess creativity through assessment of the creative process. The very popular Torrance Test of Creative Thinking (TTCT) is an example of a creativity test that focuses on the creative process (creativity-relevant skills) to assess people's creativity. Such tests assess divergent thinking skills. Tests used to measure the creative process are commonly domain-general assessments. However, there are some tests that may focus on skills in a given domain. The most widely used tests of the creative process are divergent thinking tests (Kaufman et al., 2008). Kaufman et al. (2012) consider divergent thinking assessments as the backbone of creativity assessments; they also emphasize that the majority of research on creativity uses divergent thinking tests to measure creative-thinking skills.

*Divergent thinking* is an open-ended and flexible approach to solving complex problems and tasks (Thys, Sabbe, & De Hert, 2014). Guilford's Structure of the Intellect used divergent production tests (1967) as the theoretical foundation for a number of different components of divergent thinking (i.e., Symbolic, Semantic, Figural, Behavioral).

Torrance's (1974, 2008) TTCT followed and was based on Guilford's work (Kaufman et al., 2012). Torrance Test of Creative Thinking (TTCT) remains the most widely used assessment of creativity (Sternberg, 2006). The purpose of the TTCT was not only to assess creativity, but also to be used as a tool to understand and foster creativity (Hebert, Cramond, Spiers-Neumeister, Millar, & Silvian, 2002). With regard to the components of the TTCT, there are two primary sections, a verbal and a figural section. The verbal section examines creative thinking ability using words. The figural

section uses pictures to measure the ability to think creatively. Torrance Test of Creative Thinking (TTCT) assesses four dimensions: fluency, flexibility, originality, and elaboration (Torrance, 2008). Fluency means the ability to produce quantities of ideas. Flexibility refers to the ability to create diverse categories of ideas and to perceive a particular idea from different perspectives. Originality focuses on the ability to generate novel and unique ideas that are unlikely to be generated by others. Elaboration refers to the ability to expand on an idea by providing details or creating a complex plan. This popular test has been translated into more than 35 languages (Millar, 2002). The TTCT demonstrates sufficient reliability and validity scores (Cooper, 1991; Treffinger, 1985). The TTCT-Figural Manual of 1990 reported high internal-consistency scores (i.e., greater than .90) based on a sample of 88,355 K-12 students in the United States and Canada (Torrance, 1990).

### **The Creative Press (Environment)**

The third “P” refers to the creative press (environment) in which creativity occurs and where the creative product is produced. Researchers who study the creative environment attempt to understand the social and physical conditions that affect the development of creativity (Batey & Furnham, 2006). As Soliman (2005) noted, studying the relationship between individuals and their environments is essential to assessing the environmental conditions that promote or inhibit creativity. The quality of the interactions between creative individuals and their life experiences with family, school, and society is directly related to the development of creative skills (Garcês, Pocinho, Jesus, & Viseu, 2016). This section will provide a review of social-environmental conditions that may foster or inhibit creativity. Social environments include family and



school environments. Literature regarding physical learning environments, areas of interest in the learning environment, the relationship between the use of time and the promotion of creativity, and accessibility to resources and materials will also be discussed.

### **The Social Environment**

In the Componential Theory of Creativity, Amabile (2012) asserts that the social environment is a crucial variable for the development of creativity because it interacts with creativity-relevant processes, domain-relevant skills, and intrinsic task motivation (see Figure 3). The social environment includes factors that can serve as stimulants or as obstacles to intrinsic motivation and creativity. Extrinsic motivators within the social environment are often seen as undermining intrinsic motivation (Amabile, 2012).

Research has revealed several work-environment factors that can stimulate creativity. Amabile and Gryskiewicz (1989) identified some factors that stimulate creativity: positive and challenging work, adequate freedom, appropriate resources, and a sense of cooperation. Amabile (2012) added these additional factors: mechanisms for developing novel ideas, supportive supervisors, diverse and communicative collaborators, and norms that support the sharing of creative ideas. Creative people require listening and understanding from others within their environment to increase confidence in their abilities (MacKinnon, 1978). When appropriate, creative environments must nurture and support independence of judgment as creative people tend to be self-evaluative (Runco, 1992). Researchers also studied the factors that can block creativity such as environments that are overly critical of new ideas, impose excessive time pressure,

discourage positive risk-taking, and require too much evaluation (Amabile, 2012; Amabile & Grysiewicz, 1989).

### **Family Environment**

Researchers have also investigated the effect of the family environment on either supporting or inhibiting creativity. To support creativity, parents need to be flexible and hold non-authoritarian attitudes (Mellou, 1994). Parents also need to create an environment that values and promotes risk taking, where less pressure is exerted to conform to prescribed conventions (Wildauer, 1984). However, this is not to say that pressure and stress should be completely eliminated from a child's environment. Torrance (1978) actually emphasized that moderate levels of stress are important for children to promote creativity as they learn to tolerate ambiguity and tension, so that they are less pressured to conform. Therefore, the family environment may inhibit the development of creativity if a healthy balance does not exist between promoting risk taking and allowing, to some extent, the discomfort that arises when children need to learn how to persevere on their own.

### **School Environment**

The school environment also plays a major role regarding the development of creativity. School environments that include pressure to conform, high levels of unhealthy competition, and restricted choices may suppress creativity (Amabile, 1989). However, it is important to note that initially, constraining factors do not always have negative effects on creativity. Craft (2003b) stated that the social environment that restrains choices and personal autonomy may encourage the individual to look for alternatives to develop their creativity. With that said, this theory may inadvertently

promote a “that gifted child can make it on their own” type attitude. In other words, relying on the gifted child to seek out their own creative outlets is not an acceptable solution to schools’ failure to meet creative students’ learning needs and should not be used to justify maintaining restrictive learning environments.

**The creative space.** To promote creativity in students, careful attention should be paid to the characteristics of the learning environment. Several studies have shown that in order to foster student creativity, the classroom space should be flexibly organized (Bancroft, Fawcett, & Hay, 2008; Jeffrey, 2006; Addison, Burgess, Steers, & Trowell, 2010). Particularly in early childhood education settings, it is recommended that schools not rely heavily on role-play areas to promote creativity. Rather, it is encouraged that schools provide children with greater freedom to use their own imaginations (Bancroft et al., 2008; Davies, 2011).

The classroom space and furniture play an essential role in fostering creativity. Children should have the chance to take part in designing their classroom spaces (Davies, 2011). Further, the learning environment should be as open as possible in order to nurture children’s imaginations (Bancroft et al., 2008). Classroom furniture should be minimalist and allow students to move around freely and explore different areas of the classroom space; this is believed to promote creative thinking in children (Gandini, Hill, Cadwell, & Schwall, 2005). While having an open, flexible classroom space is important to nurturing creativity, Vecchi (2010) suggested that providing a small, acoustically separate environment that is not visually segregated from the rest of the classroom (e.g., using glass walls), allows students working in groups to do so quietly and in a way that

does not disturb other students. Additionally, Addison et al. (2010) suggested that classrooms have a dedicated place to display the progress of group work.

**Areas of interest and artwork within the learning environment.** The educational setting can further encourage creativity and creative thinking by establishing social norms and cultural contexts that value creativity and creative problem-solving (Hennessey & Amabile, 2010). In order to make the learning environment a source of support, teachers should pay attention to individual student's interests and design activities and assignments that encourage the reflective thinking and imagination of each child (Zygmunt & Schaefer, 2006). Several studies have asserted that for the learning environment to encourage students to think "outside of the box" and be creative, it is important to introduce different creative outlets such as poems, music, drama, sculpture, and drawing into the school day (Chan, 2013).

**The use of time and the promotion of creativity.** The limited time provided for creative activities within the learning environment is a matter of concern when considering how to promote creative thinking in students. A number of researchers have suggested that being flexible regarding the time allotted for various activities better serves the goal of fostering creativity (Addison et al., 2010; Burnard, Craft, & Cremin, 2006; Halsey, Jones, & Lord, 2006; Jeffrey, 2006). Burnard et al. (2006), in their video-based study of pre-school children, found that for such children to become fully engaged and achieve creative outcomes in an activity, they need to be provided sufficient amounts of time to fully immerse themselves in their efforts. Allowing young people to work with no pressure and at their own pace is seen by Halsey et al. (2006) as an essential part of

supporting creativity. Pressure and short time allotments tend to negatively impact the development of creativity.

**Accessibility to resources and materials in the learning environment.** A number of studies have found a strong connection between offering a variety of supportive materials, resources, and tools and the promotion of creativity (Addison et al., 2010; Bancroft et al., 2008; Gkolia, Brundett, & Switzer, 2009; Grainger, Craft, & Burnard, 2007). Bancroft et al. (2008) suggest that providing formless materials that can take any shape (e.g., modeling foam, tissue paper, wire, and clay) play a major role in stimulating students' creative-thinking skills. Providing access to new media and technologies also promotes creativity (Addison et al., 2010; Halsey et al., 2006). Renzulli (2005) emphasized that to support creativity for gifted children, parents and teachers should provide the *resources*, opportunities, and encouragement that align with their children's interests.

To encapsulate, creative environments are needed to nurture creativity in children. The positive interaction and relationship between the individual and the social environment is essential to promoting creativity and creative thinking. Additionally, ensuring a child's physical environment consists of resources that promote creativity are extremely important given restrictive environments may stifle the development of creative-thinking skills.

### **The Creative Product (Innovation)**

The fourth "P" of the Four P's Theory of Creativity refers to the creative product. The creative product is the *innovation* that results from creative process. The creative product is probably the least studied aspect of creativity (Garcês et al., 2016). Brief

descriptions of the creative product can be found in many definitions of creativity. Several definitions of creativity describe the creative product as novel, but not necessarily useful (Çetinkaya, 2014; Hirschman, 1980). However, many recent definitions of creativity describe the creative idea and product as both novel and useful (Franken, 1994; Plucker et al., 2004; Sawyer, 2006). In fact, Plucker et al. (2004) investigated approximately 34 definitions of creativity and concluded that most creativity definitions agree that the creative product should be both novel and useful. Urban (1991) defined the creative product as “a new, unusual and surprising product [that is] a solution to an insightfully perceived problem” (p. 104). Researchers’ explicit theories of creativity require the creative product to be novel and appropriate to the problem at hand (Hennessey & Amabile, 2010).

In the development of creativity, educators should not focus mainly on the creative product. Judging creative ability by results and products regardless of content area confuses creative potential with accomplishment (Sternberg & Lubart, 1995). Creatively gifted students may require more time for the thinking process and trials before they are able to come up with a creative product. Since teachers tend to be heavily product-oriented, they may neglect the developmental aspect of creativity and have difficulty seeing opportunities to support students’ creative thinking during the development of creative products (Cohen, 1989). Instead, teachers should focus more on reinforcing personal traits that support creativity during the creative process and pay more attention to creating an environment that supports creative thinking.

Nevertheless, it is still important to introduce students to the characteristics that make a product “creative” in general. Several studies that focus on the creative product

concentrate on its characteristics (Garcês et al., 2016). For example, novelty and elaboration are important characteristics that should be present when evaluating a creative product (Puccio, Treffinger, & Talbot, 1995). Novelty focuses on the originality of the product and the extent to which it is based on unique ideas that are unlikely to be present in other products, while elaboration focuses on the complexity of the creative product. With that said, it is important to remember that the focus of the creative product tends to be more domain-specific and not domain-general, which implies that products in different fields should probably have different judging criteria for measuring characteristics of creativity. Additionally, assessment of the creative product cannot be separated from the social and cultural context in which the product is developed; context must also be considered (Wyse & Spendlove, 2007).

### **Assessment of Creative Products (Innovation)**

Unlike the assessment of the creative person, assessments of creative products are usually performed by others such as experts, teachers, peers, and/or parents. This type of assessment is more domain-specific and consists, in part, of experts in a particular field judging creative products related to their area of expertise (Kaufman et al., 2008).

Kaufman and Beghetto (2009) considered the assessment of creative products as the best way to assess creativity in a particular field, where recognized experts in the field judge the creative product. This type of assessment mainly focuses on comparisons made between the products of different individuals based on a pre-determined set of criteria.

**Consensual Assessment Technique (CAT).** The CAT was developed based on the idea that the best way to measure creative products is through the collective assessment of experts from the relevant field (Amabile, 1996). In CAT, after subjects

create their products (e.g., poems, collages, stories), experts independently assess the creativity of the products. The CAT only utilizes comparative scoring among applicants as this measurement tool does not and should not use standardized scores (Amabile, 1996). The CAT is rarely used in schools, but it is a common assessment method used in creativity research (Kaufman et al., 2012). Selecting the right experts to rate the creativity of products is a very important step as these evaluators must use their understanding of creativity within their field to compare individual's products against one other (Kaufman et al., 2008).

Kaufman and Baer (2012) reviewed the literature to determine appropriate levels of expertise to judge creative products and concluded that novices should not be used as CAT raters. However, they found that quasi-experts are good choices for raters as their level of expertise falls somewhere between the expert, who is often unavailable to serve as a rater, and the novice, who has more limited knowledge of a particular field. Kaufman and Baer (2012) provided suggested guidelines for the selection of raters, asserting that raters need to have a considerably higher level of expertise than the individuals being rated.

### **Teachers' Perceptions of Creativity**

Teachers play a crucial role in nurturing creativity in the classroom, and their engagement in that role is influenced by their perceptions and understanding of creativity (Bramwell et al., 2011; Sawyer, 2012). To incorporate creativity effectively in the classroom, it is necessary to develop an accurate understanding of teachers' perceptions of creativity (Skiba et al., 2010). Several researchers have indicated that teachers' perceptions affect how they choose to encourage or not encourage creativity in their



students (Sak, 2004). Teachers, regrettably, may suppress their students' creativity when in fact they believe they are fostering it (Skiba et al., 2010). Teachers who value creativity often have an unclear understanding of it (Dawson et al., 1999). Aljughaiman and Mowrer-Reynolds (2005) stated that teachers who have inaccurate conceptions of creativity tend to have conflicts in the classroom with creative students. Teachers are better equipped to avoid stereotypes and myths surrounding creativity when they understand the nature of it (Beghetto & Kaufman, 2010). Therefore, it seems critical is to explore teachers' perceptions and understanding of creativity by synthesizing current empirical findings on this topic.

### **Pre-Service Teachers' Perceptions of Creativity**

Kokotsaki (2012) conducted a mixed method study with 17 pre-service teachers to explore their perceptions of creativity in relation to the classroom. These pre-service teachers, who were planning to pursue a career in primary education, were interviewed and completed questionnaires. Generally, all participants put some emphasis on the importance of providing primary students with creative activities as they recognized a wide range of benefits. However, Kokotsaki (2012) mentioned that the study analysis revealed more details about pre-service teachers' conceptions of creativity, that only a small number of teachers held richer conceptions. These teachers tended to provide more detailed answers and were more accurate and comfortable in describing the creative process, in addition to being able to describe the learning style that would occur during the creative process.

Similarly, Vedenpää and Lonka (2014) conducted a mixed method design study with pre-service teachers in Finland, the majority of whom were female. Vedenpää and

Lonka (2014) designed this study to explore teachers' conceptions of creativity. The pre-service teachers in the study perceived that creativity could be improved with practice and time. The participants, who elaborated on the creative process and product, believed that both can be improved. However, Vedenpää and Lonka (2014) asserted that the results revealed that pre-service teachers were more familiar with the creative process than the creative product and focused mainly on how their students process creative thinking. In addition, the majority of the participants perceived creativity as important to learning in classrooms.

In regard to pre-service teachers' understanding of creativity in education, Newton and Beverton (2012) utilized qualitative research, conducting interviews and focus groups, with 48 pre-service teachers in the United Kingdom to investigate their conceptions and understanding of creativity within the curriculum for English language. The researchers found participants' conceptions to be confused and limited; their conceptions of creativity in English Language Art classes mainly focused on dramatic activities and simplistic lessons on story writing. The study also found that pre-service teachers were often unable to clearly distinguish between the concept of creativity, examples of creative activities, and which aspects of a particular example made it creative (Newton & Beverton, 2012).

Kampylis, Berki, and Saariluoma (2008) carried out a study to explore pre-service and in-service teachers' conceptions of creativity that included 62 pre-service teachers and 70 in-service teachers in the Athens region of Greece. The study results indicated the majority of participants were aware of the importance of creativity in education. Although the participants felt they were not well-trained and/or ready to facilitate

creativity in their students, they believed that the facilitation of students' creativity is part of the essential teachers' role. However, when Kampylis et al. (2008) asked the participants whether creativity is a characteristic of all students rather than a rare phenomenon, only about half of pre-service teachers (48.4%) indicated that creativity is a characteristic of all students. In comparison, the number of in-service teachers who indicated this statement was true was about one out of three (36.2%). Comparing this study's results with those of another conducted in the U.S. by Aljughaiman and Mowrer-Reynolds (2005), the researchers found a difference in attitudes between the two teacher populations. Aljughaiman and Mowrer-Reynolds (2005) found that about two-thirds of teachers believed the majority of their students demonstrated characteristics of creativity.

A mixed-method design study by D. Newton and L. Newton (2009) aimed to identify pre-service teachers' conceptions of creativity in school science lessons. The participants were 16 final-year students working on a degree that would lead them to qualified teacher status in the United Kingdom. The results of the questionnaire and interviews revealed that participants' understandings were limited and mainly focused on practical investigations of facts, which included misconceptions about creativity. Newton and Newton (2009) also found that pre-service teachers' conceptions of creativity could be narrow in several ways that might result in their omitting significant chances to foster creativity (e.g., the imaginative processes regarding scientific information) in their science classrooms.

A similar study was carried out with 38 pre-service teachers in a 38-week graduate teaching course at a UK university using questionnaires and semi-structured interviews to collect data on their conception of creativity (Bolden, Harries, & Newton,

2010). The results indicated narrow conceptions held by the participants, primarily linked with how to use resources and technology to teach creatively rather than teaching *for* creativity. Interestingly, the pre-service teachers tended to have a more accurate understanding of creativity than pre-service teachers. With that said, participants still had difficulties identifying ways to encourage and assess creativity in the classroom (Bolden et al., 2010).

### **In-Service Teachers' Perceptions of Creativity**

There are several studies that have explored in-service teachers' perceptions of creativity (Aljughaiman & Mowrer-Reynolds, 2005; Rubenstein, McCoach, & Siegle, 2013; Myhill & Wilson, 2013; Zbainos & Anastasopoulou, 2012). Likewise, a number of the studies have explored in-service teachers' understanding of creativity and whether teachers felt prepared to identify and foster creativity in their classrooms (Aljughaiman & Mowrer-Reynolds, 2005; Gralewski & Karwowski, 2013; Liu & Lin, 2014; Myhill & Wilson, 2013; Odena & Welch, 2009; Rubenstein et al., 2013).

Myhill and Wilson (2013) conducted a mixed-method design study to describe in-service, secondary English teachers' beliefs, perceptions, and value placed on creativity. Utilizing controlled observations and interviews, the study revealed that participants perceived some students were capable of being creative while others were not. The results of this study also indicated that, in general, the participants believed creative techniques could be taught, but that creativity itself could not be taught (Myhill & Wilson, 2013).

In the context of the U.S., a quantitative study conducted by Aljughaiman and Mowrer-Reynolds (2005) aimed to identify the perceptions of creativity and the creative

student held by 36 in-service teachers in elementary schools (Aljughaiman & Mowrer-Reynolds, 2005). Aljughaiman and Mowrer-Reynolds (2005) found in-service teachers generally believed that creativity could be developed, that teachers wanted to understand creativity, and that they felt it was essential to foster creativity in schools. In regard to the participants' relationship with creativity, they believed their schools emphasized creativity and that they fostered creativity in their classrooms. However, the majority perceived classroom teachers as not responsible for the development of creativity.

Another quantitative study, also conducted in the U.S., by Rubenstein et al. (2013) sought to measure 674 in-service teachers' implicit beliefs and how these beliefs affected their ability to teach for creativity. After analyzing the data, these in-service teachers were found to believe in the high value of creativity to society. Participants also perceived students as being able to grow in creativity and that teachers are able to develop their students' creativity, but participants were limited in their overall understanding of the nature of creativity (Rubenstein et al., 2013).

In a different study that was conducted in Greece, in-service teachers' perceptions of creativity were found to be less positive. Zbainos and Anastasopoulou (2012) carried out a quantitative study using a questionnaire to examine how Greek teachers perceived creativity and teaching activities that fostered or inhibited creativity. The participants in this study were 112 teachers in Greece, including 23 males and 89 females -- the majority were under 40 years of age. Greek in-service teachers perceived creativity as a natural gift that could only be developed in some students (Zbainos & Anastasopoulou, 2012).

Gralewski and Karwowski (2013) designed a quantitative study utilizing a questionnaire to examine the accuracy of in-service teachers' ratings of their students'

creativity. Teachers who participated in this study were teaching secondary-level students. Reflecting on these teachers' understanding of creativity, the researchers found there was a tendency to associate behavior and good grades with creativity. Gralewski and Karwowski (2013) indicated that female students were seen by their teachers as creatively active across the arts, while male students were considered to be more creative in science.

More in-depth information about in-service teachers' perceptions of creativity were found in a study that was carried out by Liu and Lin (2014). This mixed methods study consisted of questionnaires and interviews collected from 16 in-service teachers, eight females and eight males, in a metropolitan city in southern Taiwan. Attempting to explore participants' understandings of creativity, their responses fell into three categories: curiosity, autonomy, and divergent thinking (Liu & Lin, 2014). In-service teachers categorized scientifically creative students as adventurous, non-conforming, divergent, and having wide interests (Liu & Lin, 2014). In addition, participants emphasized the importance of students having scientific knowledge as a basis for generating and evaluating creative ideas. However, the researchers found in-service teachers overlooked a number of creativity aspects noted in contemporary research. For instance, in-service teachers equated creativity with divergent thinking, but they failed to recognize the role of convergent thinking in creativity. Although participants mentioned problem-solving as an aspect of creativity, they did not recognize problem-finding as relevant to creativity (Liu & Lin, 2014).

In a study conducted by Aljughaiman and Mowrer-Reynolds (2005) that included 36 in-service teachers, the participants' understandings of the definition of creativity were

manifold. The majority of teachers' definitions included aesthetic or linguistic products, originality, and intelligence. A group of teachers linked creativity with inventiveness, divergent thinking, and creative writing. When participants were asked to describe creative students, most of them described students who think differently, take risks, are imaginative, or artistic. Others stated creative students had enthusiasm for learning, humor, intelligence, rich vocabulary, or curiosity (Aljughaiman & Mowrer-Reynolds, 2005).

Odena and Welch (2009) conducted a qualitative study with six in-service teachers using observations and interviews to examine the involvement of creativity in their classrooms. The results indicated that most teachers were able to recognize the everyday creative behaviors usually described as "little c" in the literature (Odena & Welch, 2009). As the participants' understandings of creativity were under investigation, most teachers were able to identify the "innovator" and "adaptor" types of creativity in their students (Odena & Welch, 2009). Two studies found in the literature demonstrated that in-service teacher participants had very limited understanding of creativity (Myhill & Wilson, 2013; Rubenstein et al., 2013). Rubenstein et al. (2013) utilized a questionnaire to survey 674 in-service teachers from across the U.S.; they found that teachers mentioned a discrepancy between placing some educational emphasis on the development of creativity and valuing creativity. This indicated that in spite of teachers valuing creativity, they faced many educational difficulties to support and develop students' creativity. Likewise, a mixed-methods design study conducted with 32 in-service teachers in the UK using observations and interviews indicated that in-service

teachers had a limited understanding of creativity. For example, some participants considered creativity to be innate and cannot be developed. (Myhill & Wilson, 2013).

**In-service teachers' preparation and improvements in their perceptions of creativity.** Kampylis et al. (2008) conducted a quantitative study using a questionnaire to examine in-service teachers' implicit theories of creativity and their confidence in developing creativity in their elementary students. The results of this study indicated that the majority of participants do not feel confident enough and well-trained to foster students' creativity. In addition, they believed that their schools failed to develop creativity in students (Kampylis et al., 2008). With regard to teachers' feelings of preparedness to support creativity, about half indicated they were poorly prepared to foster creativity and to teach for creativity (Kampylis et al., 2008).

Since perceptions are expected to differ based on many different conditions and factors, two studies found in the literature aimed to investigate in-service teachers' perceptions of and perspectives on creativity before and after participating in professional development activities on creativity (Levenson, 2015; Park, Lee, Oliver, & Cramond, 2006). Levenson (2015) conducted a qualitative case study on one female in-service teacher's perceptions of creativity in math and how her perceptions changed after participating in a professional development course on creativity in math. Prior to joining the professional development course, the participant deemed creativity as innate, that it could only be possessed by some students. Further, the teacher initially viewed creative thinking as a moment of sudden insight. However, the participant began to perceive creativity differently during the creativity training. She began to view creativity as originality, flexibility, finding connections between math domains, and leaving



stereotypes behind (Levenson, 2015). After completing the creativity course, the teacher began to see creativity as a long-term process and that creativity could be encouraged among all students (Levenson, 2015).

Similar results were obtained from a mixed-methods study conducted by Park et al. (2006). They investigated the changes in in-service teachers' perceptions of creativity in science as a result of participating in an international professional development program. This study involved 35 teachers in Korea, 22 of whom were male and 13 females. The researchers used a combination of questionnaires and interviews to investigate these teachers' perceptions of creativity before and after joining the international professional development program (Park et al., 2006). Initially, most of the in-service teachers believed only a few students could be creative. However, after the completion of the professional development program, the majority of the in-service teachers believed that every student could be creative and had creative potential, just to different extents (Park et al., 2006). Moreover, participants began to believe that diverse creative abilities could be supported through using problem-centered science instruction to encourage creative thinking (Park et al., 2006). It seems promising that by providing teachers with professional development activities regarding teaching for creativity, their perceptions and understanding of creativity can be improved. This is especially important given teachers' understanding and perceptions of creativity are deemed essential to foster creativity, innovation, and creative thinking in students (Skiba et al., 2010).

### **Gifted Education Teachers' Perceptions of Creativity**

Since creativity is usually linked with gifted education and a number of definitions of giftedness consider creativity an important element to producing gifted behaviors, teachers of gifted students should have positive perceptions and a thorough understanding of creativity in order to be able to foster creativity in their gifted students. Unfortunately, there are limited studies focused on gifted education teachers' perceptions and understanding of creativity.

Lee and Seo (2006) designed a questionnaire using open-ended questions to examine the 42 Korean teachers' understanding of creativity. These teachers taught elementary gifted students. The responses were analyzed utilizing a qualitative content analysis method. The results revealed that 16 out of 42 teachers appeared to have a basic understanding of creativity, while 24 teachers were found to have an intermediate level of understanding of creativity. Only two teachers demonstrated a thorough understanding of creativity (Lee & Seo, 2006). This study indicated that a minority of gifted education teachers had accurate perceptions of creativity. Interestingly, less-experienced teachers seemed to have a better understanding of creativity than teachers with more experience (Lee & Seo, 2006). This study, however, did not reveal a clear picture about how participants understand creativity.

Further, a study conducted by Chan and Yuen (2014) compared differences between gifted education teachers and general education teachers to determine if there was a difference between the two groups with regard to the accuracy of their views on creativity. The researchers administered the Creativity Beliefs Scale to 399 teachers, including gifted education teachers (n = 170), and those teachers who were not involved

in gifted education (n = 229). The results indicated a significant difference between the two groups: gifted education teachers scored significantly higher than those teachers who did not teach gifted students, suggesting gifted education teachers may have a more accurate understanding of creativity (Chan & Yuen, 2014).

### **Patterns in Past Studies about Teachers' Perceptions of Creativity**

Although several empirical studies have revealed that teachers have positive perceptions of creativity, most findings suggest that teachers' understanding and conceptions of creativity are vague or limited. Teachers of gifted students often have mixed levels of understanding with regard to creativity. Moreover, the majority of teachers, including teachers of gifted students, were unable to recognize the multifaceted nature of creativity.

Despite the fact that many teachers believed that all students have some degree of creative potential, a considerable number of other teachers viewed creativity as an innate quality that can only be developed in some students. Notably, when some teachers received training on creativity, a substantial impact on their perceptions of creativity was observed. After training, some teachers who had perceived creativity as an innate quality begin to believe that all students have creative potential and that creativity can be developed.

Although creativity is an important subject in the field of gifted education, only two studies were found that focused on gifted education teachers' perceptions and understanding of creativity, and these took place in the eastern China and Korea. In-depth qualitative studies that explored gifted education teachers' perceptions of creativity in the

United States could not be located. Therefore, there is a critical need for in-depth qualitative research that explores gifted education educators' perceptions of creativity.

## CHAPTER III

### METHODOLOGY

Scholars' understanding of creativity has been significantly advanced over the past quarter century to the point where we now have a better conceptualization of what creativity is, what it is not, and how to foster it (Plucker, 2016). However, research indicates that educators may have perceptions that run counter to scholars' explicit theories of creativity (Dawson et al., 1999; Skiba et al., 2010; Westby & Dawson, 1995). A systematic review of the literature about teachers' perceptions of creativity indicated a necessity to conduct an in-depth, qualitative investigation of teachers' perceptions of creativity and how they relate to practices in the classroom context (Mullet et al., 2016). In addition, another systematic review paper urged researchers to conduct qualitative research exploring teachers' in-depth perceptions of creativity in relation to their classroom practices in various contexts (Berezki & Kárpáti, 2018). It is also important to explore educators' experiences related to fostering creativity and innovation within the school context. Plucker et al. (2004) asserted that, in spite of the advancements in the understanding of creativity, educational strategies for fostering creativity have failed to keep pace with these new findings. Educators may have difficulties fostering creativity as a result of the prominence of standardized assessment practices that may promote conformity rather than innovation (Kim, 2008).

It is necessary to develop an accurate understanding of educators' perceptions of creativity in order to inform practices of how to effectively incorporate creativity in the

classroom (Mullet et al., 2016; Skiba et al., 2010). Given the need for a deep understanding of educators' perceptions of creativity and innovation and the growing interest in creativity and innovation as important skills for the development of gifted behavior, it is necessary to attempt to understand how gifted education educators perceive and experience creativity and innovation in general and within the school context. Therefore, the purpose of this study was to better understand gifted education educators' perceptions and experiences of fostering creativity and innovation for gifted students in K-12 settings.

In order to explore this topic, two general research questions were guided the study:

- Q1 How do gifted education educators perceive creativity and innovation in general?
- Q2 What are gifted education educators' perceptions and experiences with creativity and innovation in K-12 settings?

### **Interpretive Framework and Research Methodology**

The purpose of this study was to acquire a rich understanding of gifted education educators' perceptions and experiences of creativity and innovation; therefore, a qualitative research approach is considered the most appropriate for the study. Bloomberg and Volpe (2008) stated, "Understanding is the primary goal of qualitative research" (p. 12). Qualitative research is about "understanding the meanings individuals construct in order to participate in their social lives" (Hatch, 2002, p. 9). Bogdan and Biklen (2007) described the overall goal of qualitative research as to understand, describe, and discover meaning that individuals construct and the explanations of this

meaning. Therefore, the study's research questions are best answered by applying qualitative research methods.

Understanding the philosophical assumptions that underlie qualitative research is important as these assumptions can direct research goals and outcomes as well as influence how researchers formulate research questions and seek out the information to answer them (Creswell & Poth, 2018). Different scholars in social research suggest slightly different ways to examine and write about philosophical assumptions and interpretive frameworks. Crotty (1998) recommended social researchers examine four elements in their research as these help “to ensure the soundness of our research and make its outcomes convincing” (p. 6). These four elements are: epistemology, theoretical perspective, methodology, and methods (see Figure 6).

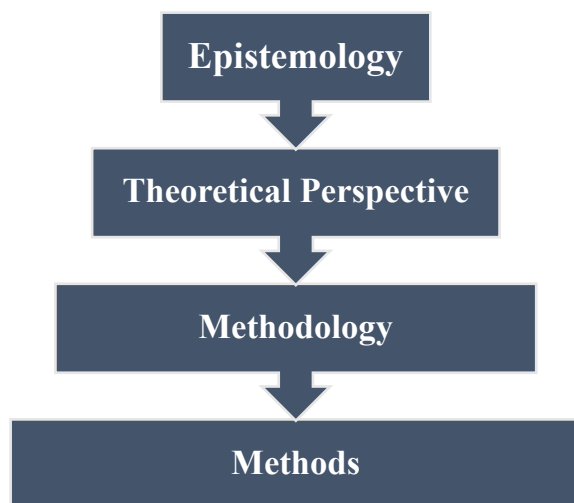


Figure 6. The Four Elements Model by Crotty (1998).

### **Epistemology and Theoretical Perspective**

There are several epistemological stances that researchers may follow; two of the most well-known epistemologies in social research are *objectivism* and *constructionism*

(Crotty, 1998). Constructionism is the epistemology that was utilized in this qualitative study. The theoretical perspective that seems to best fit with the purpose and design of this study is also associated with constructionism; it is *interpretivism*. Crotty (1998) clarified how epistemology and theoretical perspectives are related by referring to epistemology as, “the theory of knowledge embedded in the theoretical perspective and thereby in the methodology” (p. 3). Although the philosophical assumptions including epistemology are not always specified in research, the theoretical perspectives convey the epistemological stance and other philosophical assumptions (Creswell & Poth, 2018). In the constructionist view “meaning is not discovered but constructed” (Crotty, 1998, p. 42). Constructionism claims that “meanings are constructed by human beings as they engage with the world they are interpreting” (Crotty, 1998, p. 43). Interpretivism offers a framework that helps to explain human social reality and to understand perspectives (Crotty, 1998). Interpretivism tends to depend on the perspectives of the individual that is influenced by the individual’s experiences. From this perspective, the beliefs the researcher holds in the process of conducting the research are about reality not being an objective concept, but rather one that is constructed by individuals based on their perspectives and experiences. Creswell and Poth (2018) asserted that within this worldview, reality can also change in people when they have new experiences. The phenomenon of creativity and innovation is complex and multifaceted, so there is no single meaning and reality of it; the individuals’ understanding of it is evolving over time. For the purposes of this study, meanings are co-constructed between the participants and the researcher as the researcher is involved through the process of asking questions and interpreting the participants’ responses (Hatch, 2002).



## **Methodology**

The third element that Crotty (1998) suggested researchers consider is methodology. The methodology refers to the research design that forms the purpose of the study and the use of particular research methods and relates them to the desired results (Crotty, 1998). There are several common qualitative approaches researchers utilize for their research designs. Creswell and Poth (2018) identified five qualitative research designs: (a) narrative research, (b) phenomenological research, (c) grounded theory research, (d) ethnographic research, and (e) case study research. Merriam and Tisdell (2016) mentioned one more design in addition to these five approaches, that of basic qualitative research; in basic qualitative research, researchers conduct a basic interpretive study in which researchers refer to their study as qualitative research without declaring that their study is following a specific type of qualitative research.

Phenomenology is one of the qualitative approaches identified by both Merriam and Tisdell (2016) and Creswell and Poth (2018). This study employed a phenomenological research design as the methodology to gain rich understanding of gifted education educators' perceptions of creativity and innovation and how to foster these qualities in gifted students.

Phenomenology is an approach of qualitative research that describes the common meaning several individuals hold based on their experiences of a phenomenon or a concept (Creswell & Poth, 2018). Researchers who conduct phenomenological research are interested in a situation that either is a real-life experience or imaginative (Selvi, 2008). A phenomenological research approach was utilized in this study to help identify the essence and meaning of human experiences related to a phenomenon as described by

the study participants (Creswell, 2013). The phenomenon of interest in the study was how gifted education educators perceive the phenomenon of fostering creativity and innovation for gifted students within the school settings.

### **Data Collection Methods**

**Semi-structured interviews.** The fourth element in Crotty's model is about "what methods... we propose to use" to collect data (Crotty, 1998, p. 2). The main method to collect data for this phenomenological study was the one-on-one, in-depth, semi-structured interview. Interviewing is considered an effective technique for gathering data about participants' lived experiences (Van den Berg, 2005). Interviewing is also a necessary method when it is difficult to observe feelings, behavior, or how individuals perceive the world around them (Merriam & Tisdell, 2016). Creswell and Poth (2018) asserted that the typical data collection procedure in phenomenological research involves conducting interviews with individuals who have experienced the phenomenon. In Moustakas's (1994) approach to conducting phenomenological research, he suggests researchers collect data by using in-depth interviews to explore the phenomenon.

**Photo-elicitation.** The second method that I utilized to collect the data was the photo-elicitation method (Merriam & Tisdell, 2016). In photo-elicitation, participants were shown various images related to the topic of interest to stimulate discussion (Tinkler, 2013). The photo-elicitation method can help researchers to probe participants to discuss social phenomena (Rasmussen, 2004). Through this method, I attempted to stimulate participants' revealing of their perceptions of creativity and innovation and extract meaning by introducing a set of images to them that are related to creativity and

innovation. The selection of offered images for the participants was varied and included: (a) pictures that represent eminent innovators, (b) pictures that represent creative spaces and environments, (c) pictures that represent the creative process, and (d) pictures that represent various creative products. Creative products vary from aesthetic products (e.g., painting, landscape photo) to innovative products that people use every day (e.g., smartphones, airplanes; see Appendix A). Participants were encouraged to reflect on these pictures by selecting three images that best represent creativity and innovation and explaining their selections. The use of this data collection method encouraged participants to share more in-depth information that may be difficult to reach through only verbal interviews. The use of this second data collection method also helped triangulate the sources of data.

**Demographic questionnaire.** A brief demographic questionnaire was also used as a third data collection method to gather information about each participant. The collected information provided insight about important background characteristics for each participant. The demographic questionnaire included: (a) age, (b) gender, (c) race/ethnicity, (d) number of years teaching gifted students, (e) grade(s) and subject(s) taught; (f) gifted education credentials/training, and (g) past and current experience teaching gifted students (See Appendix B).

### **Procedures for Conducting a Phenomenological Study**

To conduct phenomenological research, Moustakas (1994) suggested researchers carry out a series of procedures to achieve an organized, systematic, phenomenological study. Moustakas (1994) stated that the researcher needs to discover a topic that is rooted in personal meanings and values and involves social significance and meaning. The topic

of creativity and innovation has long been of interest and value to this researcher. Moreover, the topic is increasingly seen as an imperative in education, an essential skill for the 21st century, and an important aspect of the learning development of gifted students.

The researcher should next conduct a comprehensive review of the research and professional literature in preparation for conducting a phenomenological study (Moustakas, 1994). Moustakas discussed the four major types of literature review that Cooper (1989) had identified. The theoretical review of the literature is a type that analyzes theories and theoretical discussions to explain the phenomenon. The beginning of the literature review of this study included a comprehensive investigation of the multifaceted construct of creativity, including different perspectives and theoretical discussions of how scholars understand and view creativity. The integrative review is another type of literature review that aims to review the “state of knowledge” about the studied topic in which the researcher synthesizes a set of empirical studies. In this type of review, the researcher defined the purpose of each reviewed study, identified the data collection methods, evaluated the data, and presented the results (Cooper, 1989). Cooper also mentioned the methodological review in which the researcher examines the research methods used in the published works. The fourth major type of reviewing the literature is the thematic review, where the researcher organizes and divides the syntheses of the literature into themes. This research attempted to include the features of these three types of literature review (integrative review, methodological review, thematic review) by synthesizing the relevant literature regarding empirical studies that investigated educators’ perceptions and understanding of creativity. The synthesis of the literature in

this study provided a description of each study that included: (a) the purpose of the study, (b) an outline of the research designs and data collection methods, (c) identification of the study participants, and (d) a conclusion regarding the findings of each study. Inclusion and exclusion criteria were also applied to ensure quality and only relevant studies were included. The studies in the literature review were organized within core themes based on the studies' purposes and findings and the types of teachers involved. Three primary sections related to k-12 teachers' perceptions of creativity were identified: pre-service teachers, in-service teachers, and gifted education teachers. There were also sub-themes under these core themes that were identified to provide a clear, comprehensive synthesis of the relevant studies found in the literature.

The following procedure was used to develop a group of topics or questions to guide the interview process (Moustakas, 1994). The questions in phenomenological interviews arise from an intense interest, meaning the researcher's curiosity inspires the process and personally brings the central problem or issue to the forefront for exploration (Moustakas, 1994). A human science research question should: (a) attempt to reveal the meanings and essences of human experience, (b) uncover qualitative influences on experience and behavior, (c) sustain the personal and passionate involvement of the researcher, (d) not aim to predict causal relationships, and (e) lead to careful and comprehensive descriptions of the experience rather than merely acquiring scores and ratings (Moustakas, 1994). The research and interview questions of this study were formulated to meet these characteristics.

The researcher attempted to provide broad, open-ended questions to reveal the essence of the participants' experiences and to suspend his own experience and view of

creativity and innovation during data collection. In this way, the researcher created comprehensive descriptions of the participants' meanings and perceptions of creativity and innovation. This led to the next step, conducting and recording an in-depth, one-on-one interview with each participant that concentrates on open-ended questions (Moustakas, 1994). The last method Moustakas mentioned in his approach is that of organizing and analyzing the data that will be discussed in the data analysis section. Creswell, Hanson, Clark Plano, and Morales (2007) mentioned that after describing the essence of the phenomenon as perceived by the participants, "we [the researchers] might then reflect on how past literature, theories, or practices are similar to or different from the essence we have described" (p. 255). This suggestion was addressed through the presentation of a reflection on the similarities and differences between the described experiences and perceptions of the participants and those found in past literature and theory.

### **Participants**

Participants were recruited using purposeful (Merriam & Tisdell, 2016), convenience (Creswell & Poth, 2018) sampling techniques. As there are different types of sampling strategies in qualitative research, purposeful sampling "works well when all individuals studied represent people who have experienced the phenomenon" (Creswell & Poth, 2018, p. 157). As all participants in phenomenological research must have experienced the phenomenon (van Manen, 2014), the inclusion criteria to identify eligible participants included only educators who had direct experience teaching gifted students. The researcher sought only educators who had at least three years of experience teaching gifted students in K-12 settings. In addition, only educators who have received training

and/or obtained a degree with specialization in gifted education were included in this study. Convenience sampling was also employed since some of the educators selected were educators in school districts in Colorado (where the researcher was studying his doctoral program) that have indirect or direct affiliation with his university. Eight gifted education educators, who met the inclusion criteria, were included in this study. Pseudonyms were selected by each participant to ensure confidentiality.

### **Data Collection Procedures**

The first step prior to the collection of any data was to obtain approval from the university's Institutional Review Board (IRB; see Appendix D). Next, through my research advisor, I emailed a description of the study and the inclusion criteria to a distribution list of gifted education educators that have indirect or direct affiliation with the university that I am studying my doctorate in. Eight educators who responded to the email invitation and met the inclusion criteria for the study were included in the sample.

The selected participants were emailed the consent form prior to the interview meeting to make sure they have a clear understanding of the study purpose before the interviews were conducted and to provide ample time for the researcher to respond to any queries they might have. Participants who were voluntarily willing to participate in the study were asked to read and sign the consent form before participating in the interviews. The interviews took place in a location mutually agreed upon by both the participant and researcher. The researcher offered the option of a phone or Skype interview should circumstances prevent a face-to-face meeting.

Initially, during the interviews, participants were asked to select a pseudonym and complete a brief demographic questionnaire. The following demographic information

were collected: (a) age, (b) gender, (c) race/ethnicity, (d) number of years teaching gifted students, (e) grade(s) and subject(s) taught; (f) gifted education credentials/training, and (g) past and current experience teaching gifted students (See Appendix B).

I then shared a hard copy of 20 images that represent creativity and innovation with the participants. A PDF copy of the images were emailed to participants participating electronically immediately prior to the interview (See Appendix A). Participants were asked to select the three images that they believed best represented creativity and innovation and explained their choices. They also were asked to identify any image that did not represent creativity or innovation and explain their choices. Participants were also asked follow-up questions depending upon the direction they were headed to with their explanations and asked to reflect on their perceptions and experiences with creativity and innovation.

Interviews were semi-structured and audio recorded using two different devices to ensure that no data would be lost should a device fail. The order of the interview questions was flexible based on how the researcher thought it was appropriate to best navigate the interactive experience with each participant (Merriam, 1998). The average time of each interview was between 45-60 minutes in length. The data consisted of the audio recordings, completed demographic questionnaires, and transcriptions of the interviews. After conducting the interviews, the researcher e-mailed each participant a transcribed copy of his or her interview to review and edit if needed.



### **Data Analysis**

The goal for the process of data analysis was to make sense of the collected data (Merriam & Tisdell, 2016). Data analysis in qualitative research involves preparing and organizing the research data for analysis, then reducing the data into themes, and finally representing the data in a discussion, tables, or figures (Creswell & Poth, 2018). In the beginning of the data analysis process, I familiarized myself with the data by reading through all the participants' transcripts several times (Colaizzi, 1978). Next, I identified significant statements by highlighting phrases that were relevant to the purpose of the study and research questions. I sought to identify "any segment of data that might be useful" (Merriam & Tisdell, 2016, p. 204). The step of identifying significant statements in phenomenology is considered the stage of initial coding (Creswell & Poth, 2018). Following this, I wrote notes in the margins of the transcripts, as suggested by Merriam and Tisdell (2016), to help in organizing significant statements, formulate meanings from them, and then assign codes. The assigned codes were then clustered to construct themes that were common to the participants' responses. For example, a group of several relevant open codes were combined into one theme; this process is called axial coding (Charmaz, 2014).

The process of coding was ongoing through reading all manuscripts multiple times to create and develop themes. During the process of developing and revising the themes, some original themes became subthemes (Merriam & Tisdell, 2016). I then created a master list of themes common in all participants' transcripts that reflected the patterns in the research (Merriam & Tisdell, 2016). In other words, I identified the

themes that answered the research questions and reflected the essence of the phenomenon. Each identified theme included codes underneath it, the codes were accompanied with significant statements, phrases or sentences that represent the participants' actual words; the themes are considered as baskets that include segments from the transcripts (Marshall & Rossman, 2016). The development and organization of the themes was completed under the supervision of the researcher's advisor. The last step was to incorporate all the themes to write up the results and create a comprehensive description of the phenomenon as it has been experienced by the participants (Colaizzi, 1978).

### **Trustworthiness**

Trustworthiness in qualitative research is important as it maintains the quality and worth of the study and the rigor in data collection and analysis. Lincoln and Guba (1985) mentioned that to improve the trustworthiness of qualitative research, the researcher needs to establish credibility, transferability, dependability, and confirmability. The researcher sought to strengthen the trustworthiness of the study by applying several techniques.

### **Credibility**

Qualitative researchers do not capture an objective reality or truth; therefore, they should establish credibility in qualitative research that examines what is being investigated in the study to determine whether it truly represents the participants' constructions of reality about the phenomenon under study (Merriam & Tisdell, 2016). Triangulation is the process by which the researcher applies multiple sources of data, multiple theories, or more than one data collection method; this is a powerful technique

for increasing research credibility (Merriam & Tisdell, 2016). The researcher used multiple data sources and more than one data collection method as a triangulation strategy to strengthen the credibility of the research; I applied the photo-elicitation technique in addition to the one-on-one, semi-structured interviews to collect data about participants' experiences and perceptions of creativity and innovation. As theories of creativity examine creativity through different lenses (the creative person, the creative process, the creative environment, or the creative product), the interview questions were varied to cover all four facets of creativity mentioned by Rhodes (1961) to improve the credibility of this study. This also helped to obtain comprehensive descriptions of the participants' perceptions and experiences of fostering creativity and innovation for gifted students.

Credibility was also strengthened by reporting specific and direct quotes (significant statements) that included the participants' own words. Member checks was also applied to increase research credibility. Member checks is the most important method for establishing credibility, according to Lincoln and Guba (1985), as it provides the participants with the chance to review and modify the transcripts and other research data to make sure that they are satisfied with data outcomes and can confirm that these represent their true, personal meanings. Member checks was achieved through the process of sending the participants their transcripts and asking them to check and adjust them, if needed.

### **Transferability**

Transferability is concerned about the degree to which the findings of a study can be transferred and applied to other situations with other populations (Merriam & Tisdell,

2016). It is common in qualitative research to leave “the extent to which a study’s findings apply to other situations up to the people in those situations” (Merriam & Tisdell, 2016, p. 256). In other words, the readers of the research decide whether the results apply to their specific situations. Therefore, the researcher should provide enough detailed description to meet this criterion. In this study, the researcher endeavored to provide thick descriptions of the participants and also provided data sharing through the presentation of some of the participants’ actual words to support transferability, whereby the findings of this research can be transferred to similar situations or participants.

### **Dependability and Confirmability**

Dependability and confirmability are similar in that both are concerned with consistency found in the data. Dependability is about the findings of a study being consistent with the data collected (Merriam & Tisdell, 2016). Confirmability is about the degree to which the study findings are shaped by the participants, rather than the biases and preferences of the researcher (Shenton, 2004). “Both dependability and confirmability are established through an auditing of the research process” (Creswell & Poth, 2018, p. 256). To ensure dependability in a qualitative study, the researcher can apply different strategies including audit trail, researcher’s position, triangulation, and peer examination (Merriam & Tisdell, 2016). Triangulations of data sources, researcher’s stance, and audit trail were presented in this study. The researcher’s advisor supervised the process of conducting the study including the data collection and data analysis phases to strengthen dependability. An audit trail is a detailed description of the procedures, methods, and decision making employed in conducting the study (Merriam & Tisdell, 2016). The key elements of the audit trail for this study included the bracketed

personal perspectives and the collection of field diary in which the researcher's feelings and opinions regarding the research process are documented. Notes were taken immediately after interviews and during data analysis. Effort was made through the aforementioned techniques to develop and enrich the trustworthiness of the research.

### **Ethical Considerations**

The identities of the participants were protected through the use of their chosen pseudonyms. Each participant viewed and signed a consent form to ensure their rights, to relate the purpose of the study, and to confirm that their information will be kept confidential. The transcriptions and audio-recordings will be stored for a period of three years on a locked, password-protected personal computer, after which time the audio-recordings will be erased, and the signed consent forms will be destroyed. Access to the research data will be restricted to the researcher and his doctoral committee members. Study participation was voluntary, and participants were provided the opportunity to withdraw from the study at any time they wished; all of this was stated both in writing on the consent form and verbally by the researcher before the beginning of each interview.

## CHAPTER IV

### RESULTS

The purpose of this study was to better understand gifted education educators' perceptions and experiences fostering creativity and innovation in gifted students in K-12 settings. The perceptions of creativity and innovation that these educators held, in general, were explored. In addition, this study also explored their perceptions and experiences fostering creativity and innovation of gifted students in K-12 settings.

I collected data from participants utilizing three data collection tools. The first data collection tool was a demographic questionnaire (see Appendix B). This was utilized to collect demographic data about each participant. Additionally, I collected data from participants using a photo-elicitation technique (see Appendix A) and one-on-one, semi-structured interviews (see Appendix C). During the photo-elicitation time, I first asked participants to select the three images that they thought best represented creativity and/or innovation and to explain their choices. Next, I asked them to identify any image that they thought did not represent creativity or innovation and to explain their choice to me. The photo-elicitation discussion was very open-ended; participants were asked follow-up questions depending upon the direction they were headed to with their responses and asked to reflect on their perceptions and experiences with creativity and innovation. After completing the photo-elicitation portion of the interview, I then began the semi-structured interview, which was guided by interview questions (see Appendix C).

After reading and reviewing the photo-elicitation and semi-structured interview transcripts several times, I began the process of highlighting and coding significant statements and then formulating the meaning of each one. Next, responses across participants' transcripts were compared to cluster meaning into common themes and subthemes that answered the research questions. The data from the photo-elicitation and semi-structured interviews were combined to build the themes and subthemes and write the findings.

This chapter begins by providing background information on each participant in order to provide readers with important information about their educational backgrounds and experiences. Next, the themes and subthemes that emerged from the photo-elicitation and semi-structured interviews data are presented for the following research questions:

- Q1 How do gifted education educators perceive creativity and innovation in general?
- Q2 What are gifted education educators' perceptions and experiences with creativity and innovation in K-12 settings?

### **Participant Background Information**

The study participants were eight individuals working in gifted education with various levels of experience and credentials in the field (see Table 1). The participants had experience in the following positions (some had experience in combinations of these positions): (a) gifted education teacher, (b) gifted education coordinator, (c) gifted identification specialist, (d) school principal, and (e) gifted education district coordinator. They also had different experiences in the field of gifted education. The names used are pseudonyms chosen by the participants (see Table 1).

Table 1

*Participants Demographic Information*

Pseudonym	Sex	Age	Degree/Credentials	Race/Ethnicity	Current Position	Years of Teaching Experience	Years of Teaching Gifted Students
Sandy	Female	41	Master's in Gifted Education	White	Gifted Education Teacher and Coordinator	11	11
Allen	Male	45	Master's in Gifted Education	White	Gifted Education Coordinator/ Visual Art Teacher	21	21
Ashley	Female	28	Gifted Education Summer Course Training	White	Gifted Education Teacher/ Science Teacher	4	4
Todd	Male	35	Doctorate in Gifted Education	White	School Principal	13	5
Brynn	Female	57	Gifted Education Endorsement	White	Gifted Education Coordinator/ Gifted Identification Specialist	15	15
Rick	Male	37	Master's in Gifted Education	White	Gifted Education Teacher	8	4
Jane	Female	40	Master's in Educational Psychology/ Gifted Education Endorsement	White	Gifted Education District Coordinator	19	15
Tom	Male	44	Master's in Gifted Education	White	Gifted Education Teacher and Coordinator	18	10

**“Jane”**

“Jane” was an endorsed gifted education specialist for students in grades P-12 and worked as a gifted and talented secondary coordinator for a large school district in Colorado. She was 40 years old and had been teaching for 19 years. Jane had been teaching gifted students for 15 years in schools and at the district level. She had a master's degree in educational psychology and a gifted education endorsement. Before becoming the Gifted Education District Coordinator in her district, Jane worked as a cluster classroom teacher for gifted students in a poverty impacted school. This participant also had experience with providing coaching for school leaders about gifted identification. Her other areas of experience included facilitating and teaching a multi-



age loop gifted education cluster for gifted students in 3rd grade through 6th grade (inclusive), and she was the Gifted Education Event Coordinator at the district level.

**“Todd”**

“Todd” was 35 years old. He had a doctorate in special education with an emphasis in gifted education; an educational specialist degree in educational leadership (Ed.S.); and an endorsement in gifted education. Todd had 13 years of experience in education in K-12 settings; five of these were specifically in the area of gifted education. Additionally, Todd worked as an elementary gifted education coordinator, secondary teacher, and facilitator for gifted students. At the time of the interview, he was working as a secondary school principal, a position he has held since 2013, in a school where gifted education services are delivered.

**“Brynn”**

“Brynn” was a gifted identification specialist. She was 57 years old. She had been teaching gifted students for 15 years and had an endorsement in gifted education. She had also taken a large number of courses in gifted education during her career and had attended gifted education conferences, including NAGC, CAGT, and Beyond Giftedness. She taught gifted students in the fourth, fifth, and sixth grades. She taught gifted Reading for sixth grade and Math to fifth graders. Brynn also supported gifted students in the third, fourth, and fifth grades in meeting the social and emotional goals of their Advanced Learning Plans. She also had facilitated mentor-based passion projects for gifted students and has served as a resource for general education classroom teachers.

**“Sandy”**

“Sandy” was a 41-year-old teacher and a gifted education coordinator. She had a master’s degree in gifted education and had been teaching gifted students for 11 years. Sandy taught the second through fifth grade. She also taught advanced Math to third-grade students, Math enrichment to the second grade, advanced reading to third-, fourth-, and fifth-grade students. Sandy also taught social and emotional wellness to third-, and fourth-grade students. Additionally, she run a Creative Thinking Club for fourth-grade students.

**“Allen”**

“Allen” was a 45-year-old gifted education teacher and coordinator. Allen had a master’s degree in gifted education. He had been teaching gifted students for 21 years. Allen also taught Visual Arts to students in the ninth, 10th, and 11th grades.

**“Rick”**

“Rick” was 37 years old and a gifted education teacher. He had a master’s degree in special education with an emphasis on gifted and talented education and had been teaching for eight years. Rick had four years of teaching experience in a gifted education classroom. He taught gifted students in the third, fourth, and fifth grades. Rick had experience teaching gifted students in the content areas of Math, Science, Social Studies, and Literacy. He also has taught gifted students in a pullout program.

**“Tom”**

“Tom” was a gifted education coordinator who worked for several schools. He was 44 years old and had been teaching for 18 years, 10 of which with gifted students. Tom had a master’s degree in special education with an emphasis in gifted and talented

education. He also had a secondary education teaching license (grades 6-12). Tom was an English teacher before the specialization in gifted education. He had about two decades of experience working in a summer enrichment program for gifted students.

### **“Ashley”**

“Ashley” was 28 years old and had been teaching gifted students for four years. She also completed summer courses training in gifted education. She taught students in high school. She also taught gifted students at a summer enrichment program for gifted students for four years. Ashley taught science at her school.

### **Overview of Themes**

Seven primary themes and a number of corresponding subthemes emerged from this phenomenological inquiry (see Table 2). These themes are presented through the lens of the two research questions. Regarding the first research question, three primary themes emerged representing gifted education educators’ perceptions of creativity and innovation in general: (a) creativity and innovation are interconnected, (b) creative people share distinct commonalities, and (c) creativity is a multifaceted construct. Regarding the second research question, four primary themes emerged representing gifted education educators’ perceptions and experiences fostering creativity and innovation in K-12 settings. These themes are: (a) creativity and innovation need to be fostered, (b) the learning environment plays a critical role, (c) barriers to creativity and innovation, and (d) hope for embedding creativity and innovation. Participants’ responses related to these seven themes and their corresponding subthemes follows.

Table 2

*Themes and Subthemes for Each Research Question*

RQs	Themes	Sub-themes	Representative Quotes
RQ1	Creativity and Innovation Are Interconnected	Creativity Precedes Innovation	“How can one be truly innovative if they are not creative?”
		Innovation should Result in Tangible Products	I think the most valued is...a tangible product that people can see and notice and it makes life better.”
RQ1	Creative People Share Distinct Commonalities		“I see that intensity and I see the deep absorption. I think it’s part of that brain process of allowing yourself to become a deep expert in that area, so that you can be creative.”
RQ1	Creativity Is a Multifaceted Construct	Creativity Is Complex	“[Creativity is] complex because it has a lot of parts, you have a process of creativity, you have the creative product.” “I think that creativity is not a solo part, I think it involves more different minds that are working together.”
		Creativity Requires Deep Understanding of Domain Knowledge	“Creativity comes from knowing and understanding something deeply.”
		Creativity Involves Originality and Usefulness	“I think that we tend to think of creativity as somebody who has a lot of original ideas. That’s a piece of creativity, but it’s not all of creativity. I think of a robust definition of creativity that it has to include the production of something useful.”
RQ2	Creativity and Innovation Need to Be Fostered	Leads to Engagement in Learning	“I think for me the role of both creativity and innovation, they really serve a very deep purpose of engagement.”
		Results In Long-Terms Benefits For Gifted Students	“It can give them opportunities far beyond the classroom to explore a career opportunity, to create something that’s going to change their life or other people’s lives.”
RQ2	The Learning Environment Plays a Critical Role	Students Need to Feel Safe	“the very fundamental thing is that it has to be a safe place for them. They are not going to be creative if they don’t feel that their ideas are going to be valued and accepted.”
		Adequate Time Is Critical	“The thing that I think kills creativity is when we don’t allow enough time.”
		Learning Environments Need to Be Flexible	“Don’t limit students, allow them to explore, allow them to think freely... allow students to work on the things that they want to work on.”
RQ2	Barriers to Creativity and Innovation	Educators and Parents Lack Understanding	“a lot of education and creativity has to do with people that are working together...being able to analyze in a new way and using different tools and different minds.” “the primary challenge is the perception that it’s [creativity] not rigorous, that it’s just fluffy stuff. It’s curriculum fluff. It’s just fun. It doesn’t really serve a purpose. It doesn’t contribute to learning.”

Table 2, continued

RQs	Themes	Sub-themes	Representative Quotes
		Teachers Are Overextended	"I don't think that teachers feel that they have time for that [fostering creativity]."
		Schools Are too Restrictive	"I don't think school is set up to support creativity, I don't think there's a lot of room for it." "I think the biggest one [challenge] is the structure of the school system...and then the standardized testing, that's a challenge."
RQ2	Hope for Embedding Creativity and Innovation	Leadership can Be Empowering	"I just really appreciate my principal for giving me the freedom to teach the standards in whatever way I thought was the best fit for the kids. I personally did feel supported because of my principal."
		Professional Learning Is a Necessity	"I think they're probably best prepared if they had some graduate coursework, especially a class for creativity."
		STEAM Initiatives Hold Potential	"Well, there's the big push for STEM schools and I'm an advocate of STEAM." "I would tell science teachers to think about the gifted and talented in a STEAM way."
		Technology Offers Opportunities	"I think it [technology] provides options and outlets for students to be creative and innovative within technology. There are a lot of opportunities given the multiple platforms of technology."

### **Gifted Education Educators' General Perceptions of Creativity and Innovation**

The first research question was, "How do gifted education educators perceive creativity and innovation in general?" Participants' responses focused on three primary themes: (a) creativity and innovation are interconnected; (b) creative people share distinct commonalities; and (c) creativity is a multifaceted construct. For the first theme, two subthemes emerged: (a) creativity precedes innovation and (b) innovation should result in tangible products. For the third theme, three subthemes emerged: (a) creativity is complex; (b) creativity requires deep understanding of domain knowledge; and (c) creativity involves originality and usefulness.

## **Creativity and Innovation Are Interconnected**

Participants, in general, found it difficult to distinguish between creativity and innovation as two different constructs. Instead, all of them described creativity and innovation as related constructs. Regarding the relationship between creativity and innovation, Brynn stated, “I am not sure there is a difference, it is subtle; it is a subtle difference.” She added, “They are so related.” Tom agreed with Brynn, “I think they are very related.” Jane similarly stated that creativity and innovation “go hand in hand ... I see them totally linked.” When asked to define innovation, Sandy said, “I guess I would define it pretty similarly to creativity.” Two subthemes emerged that further illustrated how participants perceived the relationship between creativity and innovation. These subthemes were (a) creativity precedes innovation and (b) innovation should result in tangible products.

**Creativity precedes innovation.** Most participants believed that people can be creative without being innovative, but no one felt people could be innovative without first being creative. Brynn stated, “innovation requires creativity.” She discussed her view of innovation, saying that she perceived it as being the end part of the creativity spectrum. Brynn stated:

There is a spectrum of creativity that is sort of context plus generation of original ideas. Innovation [is] at the other end of that continuum ... they just focus more on different pieces of that continuum ... I think that the definition [of creativity] probably includes innovation.

Tom also discussed his perceptions of creativity and innovation. He described creativity as the ideation time and “then innovation [as] those steps to make that idea happen. The

creativity might be that original thought of it ... but then the innovative is the person who sees that and makes it happen.” Allen also saw creativity as the process stage that leads to innovation, saying, “I would say creativity would be the process that's involved in innovating.” Jane explained how people used creativity to innovate, “I think innovation is the process of using creativity to change and improve ... we need to use a creative approach to innovate.” Brynn discussed innovation in technology and linked that with creativity, “You can't get those innovative leaps in technology without creativity in people.” Participants, in general, perceived creativity as the process and steps that are necessary for people to create innovative products.

Todd attempted to explain the relationship between creativity and innovation by posing a question, "How can one be truly innovative if they are not creative?" Rick also agreed with Todd that creativity is essential for innovation. Rick said, “I think in order for you to be innovative, you have to be creative.” Sandy shared a similar view, stating, “When I hear the word innovation, I think it certainly involves the creative process. I think creativity is a big part of innovation.” According to participants’ views of these two constructs, innovation would not be possible without initial creative efforts, demonstrating their perceptions of the interconnectedness between these two constructs.

While all of the participants believed that creativity preceded innovation, some pointed out that people could be creative, and just stop there, without their creative efforts leading to some type of innovation. Sandy felt that there are some creative works that would not be considered innovative. She said, referring to the peacock painting (Image 9, see Appendix A), that this image represented creativity as an aesthetically pleasing

piece of art, but it did not necessarily demonstrate innovation. Todd also shared a similar view,

You can be creative without ever putting something forward. You can have creative thought processes that never even come out of your mouth. You can see the world in different ways and see colors, and experiences, and have intuition of other people in different ways and do nothing with it. I think innovation is the process of doing something with your creativity.

From the participants' perspectives, creativity first begins with the creative process and may result in innovative products; however, individuals may also choose to stop during or after the creative process without ever creating products, innovative or not.

**Innovation should result in tangible products.** Many participants mentioned that personally or for others in society, the term innovation conjures up the image of useful, tangible results and products. Implied within their responses was also the notion that society places more value on the creative process when it results in tangible products that have a large, positive impact. Brynn said innovations that are "most valued by society are those 'big C' brilliant innovations that we see as helping our lives, enriching our lives in some way. What society values is very much product oriented." Todd also felt that people focus on the results of the creative process; they look more for tangible products that make life better. He said,

I think the most valued is someone that can put something forward in terms of innovation and technology or engineering or something like that, that they actually have a tangible product that people can see and notice and it makes life better. I think that's where the societal value comes in. That it's influencing



someone else's life greater than to the extent that a piece of music or a piece of art would.

Tom emphasized the importance of the creative thinking and planning process, but he also noted that society focuses more on innovation than the creative process that is critical in order for innovation to take place. He stated, "The most valued about innovation are the products, the things that we all use are the products." Ashley believed that people value creativity and innovative products that solve real-world problems. She explained,

I think a lot of society is looking for innovation. Innovation in real-world problems. Being creative on how to solve problems that's [sic] happening currently in the U.S., or in society... I think they focus on innovation for future world problems. For example, say climate change. Designing something that would help decrease climate change. Or how to help deforestation? Right? Like, what is the problem? How could they solve this with new technologies? So, coming up with something that's based upon what's already existing and thinking about it in a new way.

Although participants believed in creative process as central for the development of innovative products, they felt that many people in society would be interested more in the final tangible products. Some participants felt society values people who use innovation with technology. Rick said, "people who can create and who can continue to innovate with technology in ways that people find boundary-pushing but also find user-friendly" are most valued by society. Sandy felt that society places emphasis on innovative technological products and mentioned "Google innovative products" as an

example. She added, “I think that's what our society values the most. If you think about what's driving our economy, that's what we kind of value, it's these technological advances.” Jane compared innovations that traditionally have been valued by society and the current emphasis on technological innovation and creativity:

I see a lot of societal value in technological innovation and creativity. Right now, anyway. I see it in learning, I see it in style, medical science stuff, I see it in those type of things. I think that's very valued. Probably more valued than what had traditionally been seen, like art.

Todd specified certain technological innovations that he believed were considered valuable by society. He shared the following examples:

It is something that no one's ever seen before and it is just extraordinary, like when an iPhone or an iPod got brought to the market. No one had ever seen anything like that. It was so unique. That's innovation.

Sandy explained how innovation might turn an existing idea into a product that “often revolutionizes an industry.” Although most of the participants felt that creativity and innovation should result in a tangible product and that this tangible product is what is usually most valued by society, over the creative process, they did not feel that the creation of products should receive more attention and focus than the creative process.

### **Creative People Share Distinct Commonalities**

Participants perceived there are some common personality traits and skills among creative individuals that may play roles in developing their creativity outcomes (see Table 3). Personality traits refer to the qualities that make a creative person who he or

she is. While skills refer to what a person actually does or is capable of doing with regards to creativity and innovation. Participants listed many different traits and skills; however, they did not intend for these lists to be restrictive, meaning they believed individuals could possess one or many of the traits and skills that they shared. Further, in discussing traits and skills, participants spoke about adults and children interchangeably because creative personality traits and skills are not necessarily distinguished by age.

Participants believed that there are common personality traits that many creative people possess that impact the way they understand and see their surroundings. They typically did not focus on a specific personality trait, but listed many different and related traits within their responses. Allen pointed out that creative people are persistent. He said, “They stick with ideas... they have a strong self-efficacy... They don't just give up.”

Brynn described creative individuals’ personalities as follows: “unconventional, risk-taker, passionate, motivated, original, generative, open-minded, curious.” Rick used the phrase “outside of the box” to describe creative people; he also mentioned that they are “boundary-pushing.” In other words, creative people do not depend on conventional thinking to create something new or solve problems. Sandy portrayed the creatively gifted child as a challenging student:

A child who asks tons of questions, challenges norms, can be somewhat

argumentative ... their perspective often does not match up with their peers’.

Sometimes, they can even struggle to have peer relationships. They just march to the beat of their own drummer ... They're usually the most challenging students.

They usually really, really crave independence. Usually, they want to take whatever content is being taught, they want to take that in their own direction.

Todd had a similar view that creatively gifted children are not good at, “following directions ... they want to do things their own way and not stay within the boundaries of what happens in the K-12 setting.” Further, Jane emphasized the role “intensity” plays in the lives of creatively gifted individuals. Jane believed that when a person becomes intense in an area of interest, that he or she will be able to develop the needed expertise in order to become creative. She said, “I see that intensity and I see the deep absorption. I think it’s part of that brain process of allowing yourself to become a deep expert in that area, so that you can be creative.” Jane indicated that when creative people work on something they are interested in, they become intense about it and spend a great deal of time working on it, trying to develop their idea further, which often leads to deep knowledge in a domain and improved domain-related skills.

In addition to intensely focusing on area of interest, Sandy noted that creative people also enjoy working through problems and finding original solutions. In other words, a creative person “knows how to look for problems... [and is] somebody that’s really good at hearing multiple perspectives, understanding multiple perspectives, and finding solutions to best address problems.” Similarly, Todd perceived creative people as having the ability to see problems and opportunities that others do not. He said, “They see problems where other people don’t and they see opportunities where other people don’t, and have interesting ways to think about those... They’re tolerant of ambiguity, they don’t need something to be black and white or fixed.”

Further, participants believed that creative people have high divergent thinking abilities. Rick stated, "When I think about the creatively gifted child, what I think of is someone who I can pose a question to and I know that they are going to answer it in a way that I can't even begin to think of." Similarly, Ashley described the creative individual as "someone who uses their intelligence to redesign something that you didn't think was coming... I think creative people are multidimensional. They're able to think about anything in a different way. They can put on a different lens." Ashley provided the following example:

For example, if you're looking at a piece of artwork, a creative person might look at it with the lens of a historian: "Oh, this is not historically accurate." They'd also be able to put on the lens of a scientist: "Okay, let's analyze this piece of work, I see that there're some biology elements." They would look at the art piece in a different way than other people would look at it through an art lens. Being able to apply a different lens to whatever they're doing.

Ashley described creatively gifted children as very informed about multiple subjects.

She mentioned that:

I think they're 'shoot-to-the moon' type of students, where they think outside of the box to the extreme of something you never saw coming...They are unpredictable; they're also very informed about the world around them, [and] well-informed about multiple different subjects.

Tom viewed creative children as having "a really good ability to connect ideas and contents" that others would not think of. He explained that a creatively gifted child may

look at a poem and “potentially come up with a math concept or a pattern, not necessarily thinking about the words, the language, or the ideas.”

Jane proposed that we stop emphasizing domain-general creativity because creativity tends to be more domain specific. She stated, “I struggle with separating out creatively gifted children because I think that creativity is really interwoven in domains.” To Jane, the concept of the “creatively gifted person” may be irrelevant since creative people typically have distinguished skills in a specific domain. For example, stating that someone is creatively gifted does not tell us if that person is creatively gifted in science or in writing or in a different area where he or she has the ability to take his or her expertise and innovate.

Table 3

*Commonalities among Creative People as Perceived by Participants*

Commonalities among creative people	
Creative people:	
Are not afraid to be wrong, to make mistakes.	Are usually the most challenging individuals and crave independence.
Stick and play with ideas.	See problems and opportunities that other people do not.
Have a strong self-efficacy.	Bring unpredictable answers and solutions.
Don't just give up.	Use their intelligence to redesign unpredictable things.
Are unconventional, risk-taker, passionate, motivated, original, generative, open-minded, curious.	Use play and imagination in ways that are superior to other students.
Are “boundary-pushing.”	Are very informed about multiple subjects.
Ask tons of questions, challenge norms, and can be somewhat argumentative.	Have a really good ability to connect ideas and contents.
Want to take whatever content is being taught to their own direction.	Know how to look for problems, good at hearing and understanding multiple perspectives, and finding solutions to best address problems.
Can struggle to have peer relationships.	Are not good at following directions.
Are intense people.	

## **Creativity Is a Multifaceted Construct**

Participants perceived creativity as a complex construct that requires deep understanding of domain knowledge and results in original and useful outcomes. Subthemes within this theme are: (a) creativity is complex, (b) creativity requires a deep understanding of domain knowledge, and (c) creativity involves originality and usefulness.

**Creativity is complex.** Several participants described creativity as a complex construct that includes the creative process, creative context, and creative product. Brynn perceived creativity as

Complex because it has a lot of parts, you have a process of creativity, you have the creative product. When you start the creative process, you have to turn it into a creative product, and you have got the context in which all of it is happening.

Regarding the way in which creative individuals come up with creative ideas, Sandy shared the following about the image of the large light bulb (Image 6, see Appendix A): “I don't think creativity is a light bulb moment, I think creativity is a process.” Sandy referred to the creative process as potentially a long one, that creative people take time to process and develop their creative ideas in order to come up with useful, innovative products. Ashley believed that creativity requires a lot of work to produce innovative products. She looked at the images in the photo-elicitation materials (see Appendix A) and shared the following:

I think that Image 1 (picture of Steve Jobs), and Image 10 (picture of Albert Einstein) show that both are very brilliant people ... but I think that creativity is not a solo part, I think it involves more different minds that are working together.

I know that the airplane and the Apple Watch, and there's also the car were all made with different plans and created with lots of different people.

Ashley felt that creativity is complex process that involves many creative people working together and making their own unique contributions in order to successfully design and build innovative products. The participants, in general, defined creativity in different ways; however, almost all of them indicated that creativity involves a complex and long process with many trials and the vision and expertise of many different people.

**Creativity requires a deep understanding of domain knowledge.** The majority of participants perceived creativity and innovation as domain specific and that individuals need to have deep understanding and a high-level of knowledge in a particular domain in order to produce creative and innovative products. Jane stated:

I think that creativity is really interwoven in domains. You might be a really creative writer but not very creative at all in Math...I think we have creative scientists; I think we have creative writers; I think we have creative artists, creative dancers. All of those pieces, I think it's interwoven.

Ashley agreed with Jane that creativity is domain specific. She said, "I think there are multiple types of creativity in the world. I think there is creativity among coding, and creativity among art, and creativity among designing a new exercise program. I think there are different types of creativity." It is essential to have a high level of knowledge in a particular domain to be creative and/or innovative, Brynn emphasized, "Creativity comes from knowing and understanding something deeply." She added, "I think that creating a useful product requires knowledge and expertise. I don't think ideas come out of a vacuum. Creativity really has to be incredibly grounded in a profound understanding



of the field.” Participants highlighted the importance of having a deep understanding in a particular domain because they felt it would be impossible to think divergently about a specific topic or to innovate without a strong foundational understanding of that topic.

Many of the participants mentioned that creativity may be present at an early age; however, individuals need the opportunity to delve deeper into domain-specific learning in order for their creativity to grow. Jane said, “You have to have a base level of understanding, everything that's like creativity peaks later; You really have to have a deep level of content understanding to be creative ... domain knowledge is important for creativity to grow.” To help foster students’ skills in creativity, Tom indicated that teachers should first help students achieve a “level of understanding the content.” He believed that it is an essential for them to develop their creativity skills within a particular domain of interest. Brynn commented on the “blueprints of the architectural design” image, (Image 19 , see Appendix A), stating:

Creativity in that, the architect has to have a really profound knowledge of how building materials work, what design elements work, and then there's that highly creative piece about how to put that together into a unique form ... I think the process of being an architect can be highly creative in that it requires a profound knowledge of the discipline and then applying it in a unique way.

Participants stressed the need for a deep understanding of domain knowledge in order for creativity to peak and for individuals to produce great innovative products. However, they also explained that this may take a very long time to happen, as the development of domain-specific expertise usually takes many years of schooling and access to outside resources and opportunities.

**Creativity involves originality and usefulness.** Throughout the interviews, almost all of the participants mentioned that originality and usefulness are important components of creativity. They all perceived originality as a main characteristic of creativity and/or innovation that refers to the novel ideas or products that have not existed before. In addition, most of them considered the usefulness of products generated through the creative process as an essential component of creativity. Jane discussed her view of creativity:

How do I see it [creativity]? I see the role of originality and novelty. I think that creativity is often ...useful. Like when it's meant to improve a product or a process or an experience... For me it's that uniqueness and novelty, usefulness, and connections of ideas. That's what creativity would be.

Brynn referred to creativity as the production of “a lot of original ideas.” Similarly, Ashley indicated that creativity is a way of thinking that leads people “to develop something new and different.” Rick defined creativity as the ability to “see something in a different way or being able to see the potential uses of something that may not be what they were necessarily intended to be used for.”

Brynn looked at the image of the blueprints of an architectural design (Image 19, see Appendix A) and mentioned that there is a common understanding among people that creativity involves generating original ideas, but she emphasized that usefulness is also an important component of creativity and distinguished two types of usefulness, practical and aesthetic. She shared the following explanation:

I think that we tend to think of creativity as somebody who has a lot of original ideas. That's a piece of creativity, but it's not all of creativity. I think of a robust

definition of creativity [is] that it has to include the production of something useful. It may be useful aesthetically or it may be useful more practically. I'm including aesthetics in "useful."

Brynn highlighted that aesthetic artistic objects should also be considered as useful products since they may have value to somebody, including the person who created them. Brynn further elaborated on her understanding of creativity, "[It is] a process used to successfully produce novel and useful responses in order to develop new ideas, inventions or artistic objects, which are accepted as being of social, spiritual, aesthetic, scientific, or technological value." Allen also referred to the importance of usefulness in his personal definition of creativity. He stated, "My definition of creativity would be putting together ideas, tools, techniques, processes, and materials to make something useful." Many participants asserted that it is not enough to just be original. Additionally, outcomes that result from the creative process need to have some sort of utility value.

### **Fostering Creativity and Innovation in Kindergarten-12 Settings**

The second research question was, "What are gifted education educators' perceptions and experiences with creativity and innovation in K-12 settings?" The primary themes that emerged for this question were: (a) creativity and innovation need to be fostered, (b) the learning environment plays a critical role, (c) barriers to creativity and innovation, and (d) hope for embedding creativity and innovation. For the first theme, two subthemes emerged: (a) leads to engagement in learning, and (b) results in long-terms benefits for gifted students. For the second theme, four subthemes emerged: (a) students need to feel safe, (b) adequate time is a critical, (c) learning environments need to be flexible, and (d) students need opportunities to create and innovate. For the third

theme about barriers to creativity and innovation, three subthemes emerged: (a) educators and parents lack understanding, (b) teachers are overextended, and (c) schools are too restrictive. For the last theme about hope for embedding creativity and innovation, the following subthemes emerged: (a) leadership can be empowering, (b) professional learning is a necessity, (c) STEAM initiatives hold potential, and (d) technology offers opportunities.

### **Creativity and Innovation Need to Be Fostered**

All gifted education educators who participated in this study emphasized the significance of supporting and encouraging creativity and innovation in K-12 settings. Some participants felt that gifted students had a greater need for time and attention in school devoted to developing their creativity. Jane explained, “I think that the need for creativity and the need for innovation are probably really strong in gifted learners.” She also saw the development of creativity as a way to address gifted students’ underachievement, stating, “I think it's a huge tie to how to reverse underachievement.” Allen took a slightly different stance and felt that creativity needed to be cultivated in all students, not just gifted students. He said, “I think it’s important for both, gifted kids have more profound needs than the general population, of course; but creativity is something that is part of our human existence and so it is for everyone.”

Participants believed supporting creativity and innovation in schools is important since it can benefit students in many different ways. Tom stated, “there are endless possibilities that if we're fostering creativity and innovation in schools, there hopefully is no limit to what students could come up with.” Two subthemes emerged from the data that illustrated the benefits of fostering creativity and innovation in K-12 school settings.

Teachers felt that nurturing creativity and innovation in schools (a) leads to engagement in learning, and (b) results in long-term benefits for gifted students.

**Leads to engagement in learning.** Many of the participants stated that fostering creativity and innovation leads to educational experiences that are more engaging for gifted students. Jane said, “I see creativity as a really essential piece of engagement.” She explained how she perceived the role of creativity and innovation in creating an engaging learning environment, from her perspective as a coordinator for gifted education in a large school district:

I think for me the role of both creativity and innovation, they really serve a very deep purpose of engagement. I think if we can teach teachers how to leverage engagement in their class, I think if we started evaluating classrooms based on engagement levels, I think we’ll have a really different conversation in education.

Further, Allen indicated that embedding creativity “certainly makes every subject matter more interesting... I think any time you can put creativity into your subject area, you're going to increase interest.” Many participants felt that using creativity as a vehicle to create more engaging learning experiences for students often results in a more positive, supportive learning environment. Brynn said, “Kids simply enjoy school more.” Rick added that when gifted students believe the school environment consistently respects and fosters their creativity skills, “they continue to enjoy coming to school.”

Participants noted that when students engage in creativity in school, there are other benefits that result from this engagement. For example, participants mentioned that promoting creativity and innovation helps address boredom that often leads to gifted students disengaging in school and underachieving. Tom said that in classes where

students believe their creativity is welcomed, they tend to be much less bored because they are allowed the freedom to think of different ways to approach assignments and solve problems. Further, most of the participants believed that when students have the opportunity to engage in the creative process, they are able to develop both cognitive and psychosocial skills. Jane stated, "I think that that's [fostering creativity and innovation] what allows for critical thinking, I think that's what allows for engagement. I think that's what allows for real-world problem-solving." Todd said creativity can help gifted students by "building [their] self-efficacy and how they understand their own purpose and place in a classroom developing that." Due to this support and engagement, Todd mentioned that students start out thinking, "I feel better about myself," and move on to "I'm going to change the world with something that I did because I was able to foster that type of innovation in school."

**Results in long-term benefits.** All participants believed that fostering creativity and innovation in schools could result in long-term benefits not only for gifted students, but also for society. Todd said, "It can give them opportunities far beyond the classroom to explore a career opportunity, to create something that's going to change their life or other people's lives. It really can be the gamut of options." Others mentioned that it is necessary to support students in the development of their creative ability when they are young to increase the likelihood that they continue to engage in creativity and innovation as adults. Rick said, "Hopefully the long-term effect is that these inquisitive, creative kids turn out to be or continue to be inquisitive, creative adults, as well."

Regarding the long-term benefits of fostering creativity and innovation, Jane stated, "this trajectory helps prepare kids for moving into jobs and the workforce." Allen

agreed with this point about future jobs. He said, "I think about what all employers want, they are going to want employees who are resilient and who can think for themselves." Sandy mentioned that most industries no longer want "a predetermined answer" to problems they need to solve. Rather, they want people who have the ability to problem solve in creative ways. She further explained that in order to thrive in a competitive job market, "You have to find problems, you have to look for ways to be creative or innovative. The problem isn't handed to you on a silver platter."

According to many of the participants, the development of creativity and innovation not only enhance an individual's value in a future career, but also is key to developing the pioneers who will be able to improve life for larger groups of people and possibly even change the world. Rick believed that promoting creativity and innovation in schools could result in,

People who can go out and can hopefully change the world with their creativity. Nobody really changes the world much by playing it safe and not being creative. Looking for creative ways to invent new things or solve problems, coming up with solutions to things that have been plaguing people for a while... It's only been through creativity.

Tom asserted that "It's almost our duty as teachers to be fostering that in students because we're going to be counting on them pretty soon....They're going to be coming up with systems that make things better for us." Ashley also saw the potential of developing these skills in gifted children as "it will be helpful in the future to be able to have that skill to creatively think about new problems and new ways and design different ideas." Further, Brynn believed in a better future where gifted students would become pioneers

who provided “societal benefits” because these individuals had been “encouraged to innovate and create useful products” throughout their education.

### **The Learning Environment Plays a Critical Role**

Drawing from their experiences teaching and working with creatively gifted students, the participants described some characteristics they believed any learning environment must have to serve as a positive setting for creativity and innovation. Four subthemes emerged from this theme: (a) students need to feel safe, (b) adequate time is critical, (c) learning environments need to be flexible, and (d) students need opportunities to create and innovate.

**Students need to feel safe.** Participants agreed that creating a safe learning environment for gifted students is critical for fostering creativity and innovation. In other words, they felt gifted students needed the opportunity to learn in an environment where they could freely share their ideas, be encouraged to try and fail, and not worry about negative reactions from peers and teachers. Jane considered a safe environment to be the first thing that educators should think about in regards to supporting creativity and innovation in K-12 settings. Brynn also commented on the importance of the safe environment, saying,

A safe environment is essential for creativity because the kid's vulnerable, being creative can be vulnerable... the very fundamental thing is that it has to be a safe place for them. They are not going to be creative if they don't feel that their ideas are going to be valued and accepted. If they are afraid of ridicule, either from their peers or the teacher, then you are not going to have a creative environment. That safety is the very fundamental... I think those have their place in freeing up



kids to just generate ideas without worrying about what I'm I going to do with this idea. I think that can create a healthy environment.

Allen emphasized the importance of providing “psychological safety” in the creative environment. Allen shared that too much student emphasis on grades may negatively affect the learning environment because students “need freedom with an assignment to stretch the boundaries without a consequence to their grades.” Todd asked, “How much creativity and how much innovation can they really do if they don't feel safe?” and “if they don't have a relationship with the teacher?” Todd also added that gifted students’ learning environments need to not only nurture “creativity, independent thinking, and innovation,” but also students’ “affective development.” He mentioned that teachers need “to build a relationship and get to know [these gifted students] to set the culture and climate” in order to foster creativity.

Participants also mentioned that accepting mistakes was an important part of creating a safe learning environment for gifted students. Brynn said, “Allowing mistakes is part of the risk-taking environment and safe environment... That’s part of a safe building, a safe classroom... to encourage kids not just trying to come up with the right answer.” Allen shared a similar response, “I just think creative people are willing to make mistakes to learn from them... it could be fast, it could take a long time, and you just give them the freedom to make mistakes.”

Todd went further, stating that the learning environment needs to not only be a place where mistakes are allowed, but also encouraged by teachers and peers. He said that encouraging mistakes is “a necessary component so that the students know not only will they fail, but we want you to fail.” Todd explained this idea further:

Most people think it's unacceptable to fail...It's critical for everybody but especially gifted students. Students that have probably gone through much of their life never failing or feeling like a massive success in everything that they do. They need to be able to learn how to fail and fail appropriately and deal with that failure appropriately, I think is even more important for a gifted student.

Allen shared a similar point that the safe environment should focus on the “encouragement of making mistakes and learning from those, withholding of judgement.” Jane also stated that a safe learning environment that encourages mistakes and helps students grow from their failures is critical. She said, “I think creativity and innovation...these are based on failure and improvement and adjusting. I don't think they're just something that happens.”

**Adequate time is critical.** All of the participants expressed that learning environments need to allot enough time for students to develop their creative thinking and innovation skills. Jane said, “The thing that I think kills creativity is when we don't allow enough time... I think we kill creativity in education when we say, ‘You've got 20 minutes.’ This is not how creativity works.” Sandy mentioned that teachers typically do not dedicate enough time to creativity in their classrooms. She said, “I just don't really feel like we give our kids enough time for problem finding or grappling. I just feel like we need to spend more time letting kids think about authentic problems.” Allen also stated that time needs to be allotted in learning environments in order for creativity to develop. He stated that if students, “are under the gun with a really strict time limit and they have to come up with these things quickly, then it’s probably not a good thing for

the creativity.” Rick wondered how student creativity is impacted by learning environments where tasks need to be completed quickly. He said,

If students are trying to create something, I don't know that creativity can be rushed necessarily? Sometimes if it's rushed, it's almost by accident that something happens. I think that time is a huge resource, just to give kids time to continue to tinker with things and to continue to ask questions and challenge ideas.

With that said, Ashley noted that sometimes it is appropriate “to time students, give them a set time” when teachers only have a specific amount of time available for a particular learning activity. She explained,

If they're not able to complete it in that time, then that's okay because they learn from that opportunity. They learn how to manage time better. I think it's always nicer to *have more time*, but I think that when you're asking students to create something-- I think gifted and talented students can have a time restriction in order to have them think about that in a new way. I think all students can have a restriction on creating and designing.

While all the participants emphasized how important it is to provide students with enough time to allow them to work on their creative ideas and projects. Several participants like Ashley brought up the point that students should not be given unlimited time to engage in the creative process, especially since they need to learn how to develop time management skills too.

**Learning environments need to be flexible.** All participants mentioned that flexible, non-restrictive learning environments in school settings were essential for

fostering creativity and innovation. Todd advised teachers, “Don’t limit students, allow them to explore, allow them to think freely, and give them opportunities where that’s a possibility... allow students to work on the things that they want to work on.” Todd added,

It drives me crazy when I see people as gifted teachers and they claim that they’re providing all these opportunities for kids and everything’s scripted. ‘Well, here’s a lab that we’re going to do and the lab has 27 steps, now do the 27 steps and see the results at the end.’ That doesn’t do anything for creativity... That doesn’t help anybody but to say, ‘Here’s a bunch of stuff and don’t mix these two because they’re going to explode on you but everything else mix and match and do something and see what happens and be creative and explore and document your results, and then let’s talk about them and discuss and think.’ To leave things more open to investigation, I think, is critical.

Jane also commented on the need for a flexible learning environment to encourage creativity and innovation, saying “When I think of gifted students and what would really work, I think of a couple things. First of all, I think of a flexible learning environment. I’m not just talking about visually flexible, I’m talking flexible all around.” In a response to the image of a traditional classroom (Image 11, see Appendix A), Jane described the picture of the traditional classroom, where the teacher is the center and all students are facing forward to the teacher, as showing an unhealthy environment:

I think a lot about our education system, to me [image] 11 symbolized the possibility of when we try to put all kids in a box and make them all the same,

learning at the same pace, doing the same things. It's just the facing forward seats kind of look like that.

She also commented, “If there're rules about how to build something, it's not really a creative project ... That doesn't feel like a creative project to me when we put too many parameters on things.” Similarly, Todd responded to an image that includes a group of children working on different products (Image 14, see Appendix A) as representing an innovative environment. Todd stated,

I think number 14 stands out to me. Probably just because I'm an educator and I like working with kids and seeing them doing different things. I think they're obviously all working on different pieces, different products, using their creativity in different ways rather than a *structured set plan* of what they're supposed to do and create, being innovative with what they're doing.

Rick also selected Image 14 (see Appendix A) as representing a creative environment and said, “Kids are exploring and working through their ideas in the work that they're doing as opposed to necessarily following a checklist of ‘this is what you need to do and this is how you need to do it.’”

Although the majority of the participants agreed that a flexible environment is needed in order to foster gifted students’ creativity and innovation, Sandy expressed that setting some minor parameters can be helpful at times. She said,

I think probably one of the most important pieces, they always say, ‘A little bit of constraint can help creativity,’ so perhaps, kids are working toward an overarching theme or problem. However, they are able to attack that in a way that's applicable and meaningful to them.

In other words, the learning environment should not be so flexible that students do not understand the expectations for specific assignments or how to self-regulate in order to accomplish the task at hand by a certain due date. Flexibility without any type of clear parameters may cause gifted students to feel overwhelmed and increase their stress levels, which may, in turn, negatively impact their creativity.

**Students need opportunities to create and innovate.** All participants agreed that the learning environment should provide students with learning opportunities to foster their creative and innovative thinking skills. According to the participants, these learning opportunities need to be purposeful. In other words, children need to understand the goals behind what they are doing or their motivation may be negatively affected. Sandy stated that each learning opportunity, “has to be applicable to them or authentic to them, and it has to have purpose.” Jane similarly stressed that learning activities that provide students with an opportunity to be creative

need a purpose behind the creativity, and it may be to sell something or not sell something or whatever, or to create a product ... What I think kills creativity...if it doesn't have a purpose, like if you're just doing it to have something to do.

Brynn suggested exposing children to some divergent thinking opportunities “that are purely generative in their nature. That they don’t necessarily have any end other than to generate. Whether it's a SCAMPER activity, or Six Hats activity, or a forced analogy activity.” Tom believed it is important to provide children with activities that are based on open-ended questions, so students are encouraged to figure out how they are going to solve them. Similarly, Allen suggested it makes sense to “put the kids in groups and give them an open-ended problem in their subject and then have them hash out ways to solve

this problem.” Allen also discussed the importance of providing creative thinking and brainstorming activities such as SCAMPER that entails seven thinking lenses that help students to generate ideas and innovate to improve an existing product. However, Allen stated he feels many teachers fail to provide true brainstorming activities. He said,

I think brainstorming, people think they do it. Without the deferred judgement, it's not brainstorming. The teachers, I think they always judge when they're being described. I would share with them probably the rules of brainstorming so that it could be done properly.

Further, participants mentioned collaborative learning opportunities as very helpful for embedding creativity and innovation. Todd suggested that teachers try incorporating collaborative learning opportunities in their classrooms

where [students] can communicate with others and learn how to collaborate, foster creativity amongst each other in a team atmosphere. Trying to do a one-on-one can be extremely challenging, but when they have an opportunity to work together, bounce ideas off one another, their creativity grows.

Todd referred to the image of a group of children working on different products (Image 14, see Appendix A) as best representing creativity and innovation because “There's collaboration in there.” Allen described the ideal learning environment to foster creativity as “a setting where [students] can work collaboratively... because I think creativity is fostered in a collaborative environment.” Ashley also highlighted the importance of creating collaborative learning environments. She reflected on Image 4 that includes a group of children sitting around a table and working together (see Appendix A) and said, “In picture 4, I like that there are a lot of students or people that

are creating and planning. They're physically designing something together.” She also commented on an image that has a large light bulb and people around it (Image 6, see Appendix A), stating,

I see that there are different students that are taking measurements, looking at it and then thinking about it in a new way. I think that a lot of education and creativity has to do with people that are working together for one common goal, but also being able to analyze in a new way and using different tools, and different minds, and different backups... I think that creativity is not a solo part, I think it involves more different minds that are working together... I believe that students collaborating fosters a lot more creativity, and a lot more new ideas that students may not be thinking about, which could help all of them as a collective group.

### **Barriers to Creativity and Innovation**

Participants discussed some barriers to creativity and innovation they encountered throughout their experiences in K-12 settings. These gifted educators commented about different challenges including, others’ negative perceptions of creativity, the limited time they have to foster creativity, and the restrictiveness of the school system. Subthemes for this theme included the following:(a) educators and parents lack understanding, (b) teachers are overextended, and (c) schools are too restrictive.

**Educators and parents lack understanding.** The majority of the participants noted that some other teachers, administrators, and parents did not have supportive attitudes toward creativity in schools. They felt this was as an obstacle to fostering gifted students’ creativity and innovation. Further, they believed these individuals, due to lack



of understanding about the needs of gifted learners and creativity, in general, saw creativity and innovation in schools as unnecessary or simply a low-level priority in K-12 schools. Regarding this, Brynn stated:

I think the primary challenge is the perception that it's not rigorous, that it's just fluffy stuff. It's curriculum fluff. It's just fun. It doesn't really serve a purpose. It doesn't contribute to learning. [This view can come from] parents, administrators, other teachers. I'm not saying everybody feels that way, but I'm saying I think that's one of the greatest challenges.

Tom discussed his experience of coordinating gifted education programming in several schools every week. He felt supported in some schools where staff value creativity and innovation. However, he felt that some other schools held negative views not only about creativity, but also gifted education in general. He believed it was a “challenge that there are different levels of acceptances of gifted education and whether it exists.” Rick also noted that the lack of educators’ knowledge about the needs of gifted students was challenging. Rick said,

I think that other teacher's perceptions or other people's perceptions could sometimes challenge gifted educators’ efforts to foster creativity because they may not understand what gifted students need. They might start making judgements about what a teacher is doing based on what they don't understand or their limited perspective of what's been happening.

Todd also commented on this point, explaining how it is more challenging when such perspectives about creativity and gifted education are held by administrators saying, “If your administrator is not understanding or supportive, that makes it really

challenging.” Jane suggested that there should be efforts to raise awareness among all educators about the needs of gifted students and how creativity and innovation are important for them, saying, “I think that they too need to understand the ‘why’ behind it. I think that there's pockets of people who do and pockets of people who don't.” Jane discussed her experiences with teaching gifted students in poverty-impacted schools, stating that some teachers were afraid to incorporate creativity and innovation into the learning environment. She stated, “When the school is serving a lot of students in poverty, where a lot of students are below level, teachers are sometimes afraid to [implement] this approach because they think kids need basics.” However, she did not agree with this opinion as she believed creativity and innovation were very important for gifted students. She said, “This approach could actually, and from my humble perspective, change the experience of students completely, but I think teachers are afraid.” Due to a lack of understanding of the benefits of incorporating creativity into the learning environment, participants felt many educators and parents preferred that K-12 schools just focus on prescribed learning and steer clear of embedding opportunities for students to develop as creative thinkers and innovators.

**Teachers are overextended.** Although participants believed it was necessary to foster creativity and innovation in classrooms and in schools, they admitted that it could be very challenging to do so when they were busy with their other job requirements. Brynn discussed her passion for fostering creativity and innovation for gifted students, but she found the lack of time to be a big challenge, saying “I want to emphasize, it is more time-consuming. Planned creativity is more time-consuming, and spontaneous creativity is more time-consuming.” Jane explained how educators sometimes are forced

to stop creative-thinking activities before they are finished, “I think it’s a shame when some of those things are cut short and kids aren't allowed that time to connect with the parts that make them creative. I think creativity takes time, too.” Rick emphasized how important it is to foster creativity and that he felt strongly about doing so “but time isn't necessary always what we have.” Jane agreed, “I don't think that teachers feel that they have time for that.” Sandy mentioned that preparing and designing activities to foster creativity is often too time-consuming for teachers, “I feel like anytime, if you do want to design a project where students could be innovative and creative with math, that's a time-consuming process.” In addition, she also said that she does not have enough time to spend with her gifted students to be able to meaningfully engage in the creative process:

I just don't -- I don't get enough time with them. A lot of these kids, I only see for 20 minutes once a week. It's really hard because I feel like the process is one that you really need to immerse yourself and invest yourself in, and it's really hard to do when you only have 20 minutes with them. It's really, really challenging. That's the biggest challenge.

Given gifted students’ unique learning needs, many participants felt there is barely time to meet their needs, let alone focus on cultivating their creativity. Todd mentioned, “gifted students are hard, and meeting their needs is challenging, and then working with their parents is challenging because everybody's unique.” Allen explained how the time structure of the school system challenges gifted educators working to foster creativity because there are only “structured amounts of time that are equal throughout the day” and “fostering creativity does not necessarily work this way.” Although participants believed in the importance of developing creativity and innovation for gifted

students, they were overextended with school tasks and simply could not find enough opportunities during the regular school day to foster creativity and innovation for their students.

**Schools are too restrictive.** The restrictiveness of many school systems, in general, were viewed by participants as enormous barriers to fostering creativity and innovation for gifted students in K-12 settings. Participants explained that they had difficulty with their schools' focus on accountability and emphasis on grades and testing, as well as being mandated to teach prescribed curricula based on narrow academic standards. Brynn discussed the overall school system, saying "I don't think school is set up to support creativity, I don't think there's a lot of room for it." Allen also referred to the school system as the biggest challenge to fostering creativity and innovation, "I think the biggest one is the structure of the school system...and then the standardized testing, that's a challenge." Rick reflected on his experience in public schools teaching gifted students, "I would say that in my last eight years of teaching, that has not been my experience that the classroom has been set up to foster creativity or that public school education is necessarily set up that way."

Brynn felt pressure to focus and spend all of her teaching time on what she would be evaluated on. She believed it was important for administrators to include fostering creativity in gifted education teachers' evaluations or else it may never happen. Brynn said:

I just know that it doesn't feel very good as an educator to say you need to teach creativity. Creativity is a 21st century skill. Creativity is one of the big four Cs. Oh, but it's not any part of your evaluation ... We're going to evaluate you using

the 5D+ rubric and creativity isn't in here. How creative you are with your students and your lesson planning and how you foster creativity, it's not in here.

Ashley stated that many schools put more emphasis on test scores and do not value creativity and innovation. She said,

I think that schools want better test scores. It's more about getting higher test scores than it is being creative and innovative. Some schools don't care about their students having those skills, and other schools do. I think it just depends on the school ... I think that test scores have their place in learning, to understanding the concepts. But I think that for a science educator there should be more freedom on developing those 21st century skills.

Jane explained how teachers “have too much” work related to tests and scores that keep them busy, so they find it challenging to support creativity and innovation. She also added,

I would also tell you that I think we're still a really testing-focused nation and not necessarily in a good way. It's all about state testing and it's all about how you score compared to other schools, it's set up to be competitive. It's set up to lose funds if you don't score at a certain level.

Allen also explained how teachers have more responsibilities to prepare students for standardized tests, “People are teaching to the test, I feel like they have to cover a lot of information and they don't have time for enrichment and creativity. I think that stifles creativity in a lot of those areas.” However, as a visual arts teacher, Allen felt he had fewer test score challenges and more opportunities to encourage creativity:

Being that I'm a visual arts teacher, I don't have to work within the tested areas. So, I've had a lot of opportunity just day-to-day, every day, I've got the opportunity to do that. My subject area is not tested, so I don't have that hanging over my head.

Tom noted that curricula is sometimes too restrictive and does not allow teachers to foster creativity because lessons are too scripted. He said, "The district gives them the entire curriculum. Sometimes, it's scripted so that they're like, 'Day 1, I say this. Day 2, I say this. Day 3, I say this.'" Then Tom added, "They sometimes can't come up with a creative project for the kids to do because the district has given them the curriculum that they have to do." Sandy shared her experience with a particular math curriculum:

What's hard is and I just talked to someone at my district about this, with math curriculum, for instance. It is so prescribed what lesson we need to be on at what point of the school year, and what the learning outcomes look like, and the types of assessments that we use. It's just like it's so scripted that it leaves very little time for us to take students on a more creative path with the content.

Jane also discussed how curricula are sometimes designed in a way that does not support creativity, which makes it difficult for teachers to embed creativity within the curriculum. She stated:

Yes, we value creativity and innovation, and here's a giant curriculum, but it's not designed around that. You can put it in there, and you can glue it in there, but how are you going to do that and how are you going to cover that in time?

Academic standards were also considered by some participants as barriers to encouraging creativity and innovation. Rick said, "Standards are one of them, having to

teach to specific standards.... That there's a certain way you have to do things, and there's a certain set of things you have to hit, and how you have to hit them." Rick explained how standards impact creativity, "Often times, we have to get rid of creativity at the expense of getting standards and teaching into the task." Brynn believed that creativity is embedded in the standards as one of the 21st century skills, but academic standards do not allow teachers enough time to support creativity for gifted students. She mentioned, "I know that it's in the standards, but it's in there as a 21st century skill under collaboration, creativity, critical thinking, cooperation, whatever ... There's such incredibly heavy time pressure to teach the academic standards." Sandy, however, did not perceive standards as obstacles in her gifted classroom. She explained that "I'm given carte blanche to do what I want with my gifted students in my classroom because they're coming to me during non-instructional time, so they're not really missing classroom time." When gifted education services were seen as enrichment and not interfering with instructional time, participants felt it was more feasible to embed creativity into gifted students' learning activities; however, pulling out gifted students for short durations during the school week still limited their ability to infuse creativity effectively.

### **Hope for Embedding Creativity and Innovation**

The participants believed there was still hope for educators to prioritize creativity and innovation in K-12 schools despite the barriers they faced to doing so. Participants shared their optimistic experiences related to fostering creativity and innovation in schools and hope for the future. The following subthemes emerged: (a) leadership can be

empowering, (b) professional learning is a necessity, (c) STEAM initiatives hold potential, and (d) technology offers opportunities.

**Leadership can be empowering.** Participants found the roles of their school leaders to be very powerful in impacting the ways in which creativity and innovation were cultivated in their schools. All of the participants shared their opinions and experiences concerning how leaders can support teachers in their mission to consistently infuse creativity and innovation into learning. Brynn explained how she felt supported in her school to incorporate creativity learning opportunities into her teaching despite needing to teach to rigid academic standards:

I think I was very fortunate in my teaching, I think I was really fortunate in my leadership, because of my principal. My principal did not care how I taught. I had to teach the standards, but within that, I had complete creativity in how to do it ...I just really appreciate my principal for giving me the freedom to teach the standards in whatever way I thought was the best fit for the kids. I personally did feel supported because of my principal.

Tom worked as a gifted education coordinator at several schools. He shared his experiences working with different leaders in those schools and how their attitudes impacted the way he provided creative and innovative activities within each school. Tom said, "That's changed throughout the different districts and different schools I've been in. A lot of that depends on the building leader." He continued, stating,

That is building to building in our district. There might be one principal at one little school that's like, 'Yes, I've read up on this. I think GT instruction and that method of teaching, reaching those students, and critical thinking, that's going to



help all students. That's what we're doing for our students.' Just down the road, you might have a principal that says, 'I don't even believe in gifted ed. I don't think that we should be doing that at all.'

Allen discussed the trust and freedom he received from his principal and how it encouraged him as a teacher, "My principal is really good about just supporting that, supporting ideas I might have, staying out of my way." Allen added, "He is very good about staying out of everyone's way and letting them to do their job." Allen then described his principal's supportive philosophy: "He's been there for 19 years. He has pretty much hired every one of the staff. His philosophy is to hire the right people and get out of their way. That's been a big blessing." Ashley discussed how, if the school leader provides support and opportunities for teachers with regard to creativity and innovation "that would benefit both students and teachers so that they can help implement this [to support] 21st century skills." Rick discussed the issue of having to teach some fixed curriculum and the supportive administrator's role in helping him work around this issue in order to better support students' creativity:

I have fabulous administrators who support me in the work that I do. Who say things such as, 'This is the curriculum and it's one piece and it's one way in order to teach to your student. If the curriculum doesn't work for your students, we give you the freedom in order to reach them in ways that other school may not give you.'

Rick discussed what educators need to better encourage creativity, stating that they need "support from their bosses in order to feel as though they can take these risks. Trust from

their bosses that they are doing the work that is best in service of their students.” Rick shared his experience in his school:

In my school, my principals are very hands off meaning that they say we are hiring the people that we think are the best people to do this job. We trust that, as adults who have gone through years of training, you are going to be able to reach your students in the way that you need to and the way that best meets their needs. By doing that, and by having that hands-off approach, they help foster the sense of like, ‘No. I’m an adult. I can do this. I can take these chances. I can take these risks [to foster creativity and innovation]. If it doesn’t work, that’s okay. But if it does work, then that’s good for them.’ That will be good for both, students as well... I know that I am lucky in the school that I am at because the administrators that I have are very pro risk-taking. They are champions of creativity, whereas often times administrators and bosses are very much, ‘There’s a specific way that I used to do it when I was a teacher so that’s the way I think you should be doing it now as a teacher.’

As a school principal with many prior years teaching gifted students and supporting creativity, Todd shared “people go to what they’re comfortable with and what their principal is prescribing to them, and if they’re not comfortable with it then the teachers are going to back off.” Jane, the gifted education coordinator for her district, believed fostering creativity and innovation needed to go “beyond the administrator and the principal. Really, it goes into an ideological approach from the district. For a principal to support it, the principal needs to be supported. You can’t just dream this up and just do it.” She felt, however, that school leaders can help teachers foster creativity and

innovation for students by “allowing teachers to be really well trained so that they can make great decisions.” While all of the participants previously noted barriers to embedding creativity and innovation into schools, many felt that their schools’ leaders were able to provide the understanding they needed to address several of these barriers.

**Professional learning is a necessity.** Participants reflected on their experiences with graduate-level training and professional development in gifted and talented education and how these experiences helped them to better infuse creativity and innovation into their work with gifted students in K-12 schools. Allen said that he felt better prepared to foster creativity and innovation right after he took a graduate-level course in creativity when he was completing his master’s degree in gifted and talented education. As a visual arts teacher, Allen remarked upon how strange he thought it was that he had not received training in creativity as an Arts major, saying “I did not even receive training in creativity in my visual arts program. I didn't get there until I did the master’s in GT (gifted and talented).” Allen added, “That's really strange, looking back, that in the creative arts degree, there's no instruction for creativity and creative thinking techniques.” Rick also raised similar points concerning how graduate-level courses in gifted education offered his only opportunity to in understanding creativity. He said, “I didn't have that until I finished my master’s or until I was in my master’s degree in Gifted Education, where there was a whole class centered around creativity.” Sandy felt that she began to teach better and support more creative learning opportunities for her gifted students after she took graduate-level courses on creativity and giftedness:

I [had] just got my gifted master’s. That was great, that creativity was a big part of that process. In fact, I believe there was an entire course dedicated to creativity

and it did impact how I teach. ...Because when I analyze how I used to teach, I relied heavily on analytical thinking skills. Sometimes I would integrate practical thinking skills, but I don't know that I was doing a very good job of truly tapping into kids' creative thinking skills.

Allen similarly mentioned the impact graduate-level coursework in gifted education can have on teachers' preparedness to foster gifted students' creativity. He said, "I think they're probably best prepared if they had some graduate coursework, especially a class for creativity." Todd, a school principal, discussed his school's experience providing gifted education services and said that gifted education teachers "are better suited [to embed creativity] if they've been through a grad program to become a GT Specialist or something like that." However, Todd felt that graduate-level coursework was not always enough. He shared that successfully cultivating gifted students' creativity is based on "a combination of taking the classes and then working with students, working with a mentor to develop your process over time. Just because you have a master's or a doctorate in GT doesn't mean you're an expert." In other words, professional learning focused on creativity and innovation needs to be ongoing.

Not all gifted education teachers receive training in giftedness and creativity, as Allen noted:

I'm from a small district and, to tell you the truth, some GT teachers are usually just a regular classroom teacher with no special training in small districts.

They're put in without really knowing too much about gifted and talented.

Jane stressed the importance of providing training for all gifted education teachers:

I think that they need training. I think it needs to be more than just an assumption that someone who teaches gifted education is going to understand the rule of creativity. I don't think that they always understand why creativity is so important. I think that training should also include some of the overexcitabilities and some of those conversations at least, on the intensities of gifted students. I think they need to be trained.

Ashley also suggested that "gifted educators need more training on new technological advancements that can foster more creativity and innovation for gifted students."

Further, Tom suggested providing professional development training on creativity to gifted education teachers, saying he considers that as the most important way to help them learn how to embed creativity into their teaching.

While the participants noted that gifted education teachers need training in giftedness and creativity, especially given how transformative and impactful training had been for them, they also stated that training should be available for *all* teachers. Todd said,

I think most teachers are pretty lacking in the area of gifted education, and any sort of background, what creativity means, how they develop it in their classrooms, what giftedness even is, any of those things. And I think some fundamental courses in undergrad teacher prep programs would be very important. We get one course on special education. In that course, there's generally one day, part of a day devoted to gifted education and it gets lost, and most people don't remember anything.

Rick thought it was unfortunate that teachers in general education are not trained in how to foster creativity. He said, “I don't think they do feel prepared for that simply because when you go into an undergraduate education program, there's hardly any classes about gifted education in undergraduate programs, let alone solely dedicated to creativity.”

Jane agreed with Rick, saying “I think creativity should be one of the courses. There are a few things that I think have the potential to go across every domain of how we define giftedness, and creativity is one of them.” Brynn suggested that in-service teachers should be provided with training on creativity and innovation, “It needs to be part of teacher training. We need instruction on it. We need practice. It needs to be supported by districts and administrators. I think we need opportunities for ongoing professional development.” The participants all viewed professional learning on giftedness and creativity as critical to fostering creativity and innovation in K-12 schools. Many shared their personal experiences taking graduate-level coursework in gifted education and explained how this positively impacted their ability to meet their gifted students’ need in general and with respect to developing their creativity. They believed there was hope for schools and districts to provide professional learning opportunities for teachers in these areas and noted that some schools and districts were already doing a good job supporting their teachers’ professional learning in these areas.

### **Science, Technology, Engineering, Arts and Mathematics ‘STEAM’**

**initiatives hold potential.** Although education systems seem to put up various barriers to fostering creativity and innovation in K-12 schools, some participants felt the new trending educational initiative (STEAM) could open the gate for increased opportunities to embed more creativity and innovation in schools. Half of the participants referred to

STEAM in their discussion about fostering creativity and innovation in schools. During his discussion about schools' opportunities to foster creativity, Allen thought that the 'STEAM' initiative was providing more room for teachers to foster creative and innovative thinking. Allen said,

Well, there's the big push for STEM schools and I'm an advocate of STEAM, with the arts in there too. It was a big push for engineering, architecture, using science, and the whole STEAM idea. I think that reflects on what at least governments and school systems believe in, what they value. ... We can see it reflected in the school system. The school has always been interested in language and mathematics and now with technology.

Jane also believed STEAM is being valued more in schools, which can help teachers to better encourage creativity and innovation. She said, "The STEM direction is really valued. Occasionally people balance it with STEAM a little bit, but I think that that's been a place of societal value in education right now." Ashely, a science and gifted education teacher, suggested teachers apply STEAM techniques for gifted and talented students since it is becoming more accepted and valued in schools. She said,

Coming from a science perspective, I would tell science teachers to think about the gifted and talented in a STEAM way, so being able to provide challenges and different missions that uses multiple different types of subjects together and being able to have students be the students directing that learning.

Although STEM is becoming valued more in schools, participants added that educators should also pay attention to students' interests in the newer trends that include Art, such as STEAM. Todd shared, "I might think all my kids are highly invested in

STEM and they need all these science technology engineering projects.” However, he also went on to explain that some students prefer to focus on art, stating that some students might say “We want to focus on music and the arts.” Many of the participants loved the idea of capitalizing on the momentum of the STEAM movement in many districts to encourage creativity and innovation in schools. They felt gifted educators needed to use trends like this to their advantage in order to provide the more focused support in developing creativity that many of their gifted students need.

**Technology offers opportunities.** Participants perceived the advancement of technology as another way to encourage more creativity and innovation in schools. However, all participants believed that it has to be balanced and that overuse of technology can be harmful for students and their learning outcomes. Brynn said that technology can help students to test and transfer their ideas into products:

It's pretty cool that almost anybody can produce a pretty professional-looking document. There can be a greater match between what a kid envisions and what they can actually produce. There was a time where, as a kid, I had all these ideas but the tools have made it so much easier to bring it to fruition, whether it's music mixing, or having a million songs at your fingertips, or the ability to remix, the ability to mix elements through technology.

Todd noted that technology provides more opportunities to support creativity and innovation. He said:

I think it provides options and outlets for students to be creative and innovative within technology. There are a lot of opportunities given the multiple platforms of technology and that they have a computer in their pocket that I didn't have



when I was growing up. That's drastically different. ... They can create an app on there that might be highly innovative and creative. That wasn't available when I was a kid.

Allen thought technology could allow students to better collaborate and have access to information that would help them foster creativity. He said, "with technology, there's better collaboration and there's a lot more information out there that's just at our fingertips all the time." Allen compared how students used to search for information before and after current advancements in technology. He shared, "Kids are no longer digging through stacks of magazines to find a photograph to draw from. They go straight to a screen and it's instant... I think it's been a plus. I think technology has helped creativity out." Rick also commented on technology and creativity, "I think technology can be a great help in terms of fostering that creativity." Rick shared some examples to clarify:

There are programs that students are interested in. For instance, you look at something that might seem asinine like Minecraft but there is also value to that. There is also stuff that students are learning about in terms of building and architecture. The knowledge of that -- they're fostering within that...Students can also have programs on their phones that are on their computers or iPads that are helping them in their interest and passion about becoming a filmmaker. Well, here's iMovie on your iPhone that's helping you reach that goal.

Ashley also shared the belief that "technology is a tool that can help foster creativity and innovation... it's enhanced students' abilities because they have different apps and

different websites.” She felt access to more advanced technology has created new opportunities that did not exist before. Ashley gave this example:

For example, a teacher can't show you what's an atom but there are simulations that exist that students can physically add protons and neutrons to be able to show an atom and how they change form by adding different numbers of protons. So, I think that technology has created new opportunities that didn't exist before, so students can think about really tough concepts in new ways.

Jane also shared that technology can help children think differently and make connections that will, in turn, help them to develop their creative thinking skills. She said, “I think when kids really have to think, I think technology is a great way to make those connections and bind things together... I think that it [technology] just created a whole new platform for thinking and social connections.” Jane reflected on an image that included social media applications (Image 5, see Appendix A) and explained how in her district, they have utilized certain technology apps to foster creativity and collaboration:

A lot of things that we see in apps and what we use with kids is meant to spur creativity and creative thinking and collaboration and those types of things. I see apps often as a very gateway opportunity for enhancing a conversation or enhancing the work students do. An example might be creating authentic audiences is something we can do with apps a lot. We can create a lot of collaboration platforms, a lot of video platforms, those types of things.

Sandy described most of her gifted students as very advanced with regard to technology. She shared, “I feel most of my students, they understand technology more than I do, that's for sure. They blow my mind with their ability to do coding, and they're

just fearless when it comes to technology.” Sandy and other participants believed that technology could be seamlessly incorporated into learning activities to not only provide opportunities for students to develop as creative thinkers and innovators, but also to provide them with opportunities to engage in the creative process in a way that they find meaningful, interesting, and valuable.

### **Summary**

This chapter described gifted education educators’ perceptions of and experiences with fostering creativity and innovation in gifted students in K-12 settings. Seven themes regarding participants’ perceptions and experiences emerged in this phenomenological inquiry. The first three themes were associated with Research Question 1 and dealt with participants’ general perceptions of creativity and innovation. Participants noted that creative people share distinct commonalities. They perceived creativity and innovation as interconnected constructs with creativity often preceding innovation and innovation resulting in tangible products. Participants also believed that the creative process is multifaceted and complex. Participants further shared that creativity requires a deep understanding of domain knowledge that is necessary for individuals to produce original and useful outcomes.

The next four themes addressed Research Question 2 and were associated with gifted education educators’ perceptions and experiences fostering creativity and innovation in gifted students in K-12 settings. Participants emphasized that creativity is important and needs to be developing in schools. They believed that creativity leads to engagement in learning and results in long-term benefits for gifted students. Participant also indicated that the learning environment plays a critical role in fostering creativity

and innovation for gifted students. They said that in the creative environment students need to feel safe, adequate time needs to be provided, learning environments need to be flexible, and students need opportunities to create and innovate.

Further, participants described their experiences in K-12 settings fostering gifted students' creativity and innovation. They discussed barriers they perceived or actually encountered that hinder creativity and innovation in schools. These barriers included educators and parents lack understanding of creativity, teachers being overwhelmed by school requirements, and the restrictiveness of the school system (e.g., narrow academic standards, prescribed curriculum, emphasis on grading and standardized testing). At the same time, participants discussed how there was still hope for educators to boost creativity and innovation in K-12 schools despite the barriers they faced in doing so. They stressed that leadership can be empowering, and supportive school leaders can play a critical role in creating a school culture that values creativity and innovation. Participants also noted that professional learning in gifted education and creativity help educators effectively foster creativity and innovation. They also mentioned that the recent STEAM initiatives in education hold potential for encouraging creative and innovative thinking, and advances in technology in schools afford greater opportunities for teachers to seamlessly embed opportunities for students to be creative in their classrooms.

## **CHAPTER V**

### **DISCUSSION**

Chapter five presents a discussion of the results of this study as they relate to the literature on creativity and giftedness. Discussions of this study's findings are framed by the two research questions. Additionally, implications for educators, limitations of the study, and suggestions for future research are discussed.

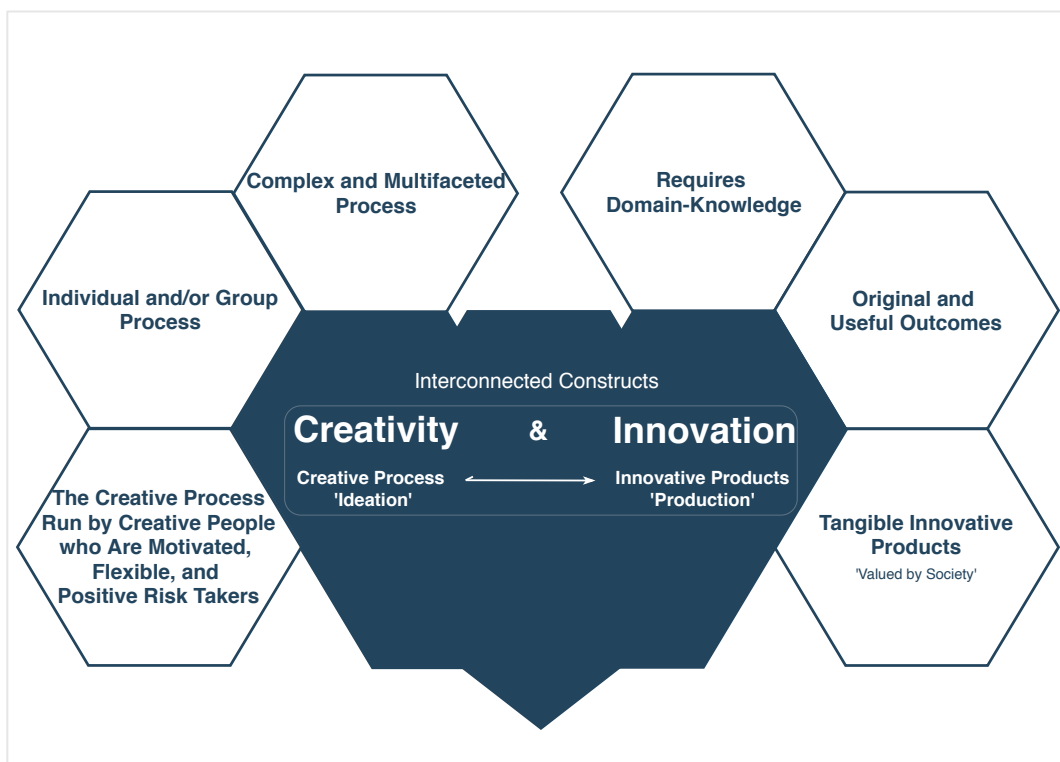
The purpose of this phenomenological inquiry was to better understand gifted education educators' perceptions and experiences fostering creativity and innovation in gifted students in K-12 settings. The perceptions of creativity and innovation these educators held, in general, were explored. Further, this study explored gifted educators' perceptions and experiences fostering creativity and innovation in gifted students in K-12 settings. The following research questions guided this study:

- Q1 How do gifted education educators perceive creativity and innovation in general?
- Q2 What are gifted education educators' perceptions and experiences with creativity and innovation in K-12 settings?

#### **General Perceptions of Creativity and Innovation**

Exploring gifted education educators' perceptions of the constructs of creativity and innovation was one of the primary goals of this study. Findings indicated that participants perceived the constructs of creativity and innovation as interconnected. They saw a sequential relationship between these two constructs, with engaging in the creative process being followed generally by some type of innovation that resulted in tangible

products. They perceived creativity as a process that could lead to the development and creation of innovative products (see Figure 7).



*Figure 7.* Gifted education educators' perceptions of creativity and innovation

This view of the interconnectedness between these two constructs is similar to established views found in the research on creativity and innovation. For example, Treffinger et al. (2013) stated that innovation is a subset of creativity that refers to the innovative products of the creative process. The study's participants perceived creativity as an essential component to reaching the goal of producing innovative outcomes.

Participants also highlighted common personality traits and skills that creative people may have. Their descriptions of creative people also seemed to be grounded in research on creativity. For example, participants perceived creative people as willing to

overcome obstacles, take positive risks, tolerate ambiguity. Further, they saw these individuals as having high self-efficacy. All of these traits are included in the Investment Theory of Creativity as common personality traits seen in creative individuals (Sternberg, 2006; Sternberg & Lubart, 1995). Interestingly, the participants in this study did not share common misconceptions about the qualities of creative individuals that many regular classroom teachers were found to possess in previous studies (Kampylis et al., 2008; Kokotsaki, 2012; Myhill & Wilson, 2013; Newton & Beverton, 2012; D. Newton & L. Newton, 2009; Zbainos & Anastasopoulou, 2012). Participants' perceptions of common traits and skills associated with creative people indicated that they had a deeper understanding of who creative people are, especially based on what previous research has found. For example, Burnard and Younker (2004) posited that, through the creative process, creative people overcome boundaries and limitations when attempting to solve a problem creatively. The participants similarly described creative people as boundary-pushing individuals who do not limit themselves by restrictions imposed on them by others. In addition, creative people were perceived as being intense and intrinsically motivated to work hard in a particular area of interest. Motivation is a central component of creativity in many theories of creativity, according to a number of studies (e.g., Amabile, 2012; Csikszentmihalyi, 1996; Sternberg, 2006; Sternberg & Lubart, 1995).

Gifted education educators perceived creativity, in general, as a multifaceted and complex construct that involved the creative person, process, and the creative environment. Their view aligned with Rhodes (1961) theory on creativity, which posited that creativity is multifaceted and includes the creative person, the creative process, the creative press (environment), and the creative product (innovation). Participants also

indicated that they perceived creativity and innovation as complex, since it takes a long time for creative people to process and develop their creative ideas and to come up with innovative products. They also referred to creativity as complex because they felt the process of creating often involves creative people working together to successfully design and build a remarkable innovative product. Again, this mirrored other findings such as Sawyer's (2006), which viewed collaboration as an important component of creativity. In other words, creativity often involves a group of people working collaboratively to create new and useful products through interaction amongst the group's members. Generally, participants noted that creativity involves a complex and long process with many trials and a shared vision among different people engaging in the creative process together.

Further, participants stated that they perceived creativity and innovation as domain-specific. They highlighted the importance of having a deep understanding in a particular domain because they felt it would be impossible to think divergently or innovatively about a specific topic without a strong foundational understanding of that topic. Their perception of creativity as requiring a deep understanding of a specific domain aligned with Amabile's (2012) and Sternberg's (2006) belief that relevant knowledge is important for creativity to grow. With that said, participants acknowledged that specific knowledge of a given field alone is not enough for creativity to be developed; creative people should have creative thinking skills and be in an environment that encourages creativity. Researchers have similarly noted that field-specific expertise should not be over-emphasized as it may sometimes result in a closed and entrenched



perspective causing the individual to be unable to move beyond the way that she or he has approached a topic in the past (Sternberg, 2006).

Additionally, gifted education educators perceived originality and usefulness as important components of creativity. They all identified originality as a major characteristic of creativity and innovation. Originality refers to the novel ideas or products creative individuals produce that have not existed before. In addition, participants said they considered the usefulness of products generated through the creative process as an essential component of creativity. Participants' shared contention that originality and usefulness are key ingredients of creativity is supported by numerous recent studies that also state creative and innovative products must be both original and useful (Beghetto & Kaufman, 2007; Franken, 1994; Plucker et al., 2004; Sawyer, 2006; Treffinger et al., 2013). Therefore, the overall examination of participants' views of creativity and innovation indicated that they were consistent with current research on explicit theories of creativity.

This finding from this current study, which included only a sample of gifted education educators, contrasts current research that suggests educators, in general, have inaccurate perceptions of creativity that run counter to researchers' explicit theories of creativity (Dawson et al., 1999; Skiba et al., 2010; Westby & Dawson, 1995). For example, Makel (2009) asserted, regarding how educators approach creativity in schools, there is a disconnect between theory and educators' understanding of creativity. Similarly, two more recent systematic reviews of the literature on teachers' perceptions of creativity indicated that educators (mostly general education teachers) held inaccurate

perceptions and beliefs that hinder the development of creativity (Berezki & Kárpáti, 2018; Mullet et al., 2016).

After reviewing the literature on educators' perceptions and beliefs about creativity, Berezki and Kárpáti (2018) found that a lack of training on creativity was one of the most frequently cited barriers to educators having an accurate understanding of creativity. Therefore, participants' depth of understanding of creativity and innovation in this study may be attributed to their advanced training in gifted education and creativity, predominately received through graduate-level coursework. This advanced level of training is undeniably linked to participants' understanding of the complexity and interconnectedness of creativity and innovation. The effect of creativity training on educators' perceptions of creativity has been studied by Park et al. (2006) and Levenson (2015). These researchers studied the effect of this type of training on participants' perceptions of creativity after participating in professional development focused on creativity. These studies found that prior to participating in professional development, the participants held many misconceptions about creativity. However, after completing training on creativity, the participants were able to develop a greater understanding of the construct of creativity and how to develop it in students (Levenson, 2015; Park et al., 2006). Similarly, the findings of this study support the importance of training, whether through professional development or graduate-level coursework, on educators' understanding and application of creativity in K-12 school settings. Training is significant given that teachers' accurate understanding and perception of creativity are deemed essential to their ability to foster creativity and innovation in students (Skiba et al., 2010). Beghetto and Kaufman (2010) also emphasized that educators are better

equipped to avoid the myths and stereotypes surrounding creativity when they understand the nature of it.

### **Fostering Creativity and Innovation in Kindergarten-12 Settings**

#### **The Importance and Benefits of Fostering Creativity and Innovation**

Regarding the importance of creativity and innovation, all of the gifted education educators that participated in this study stressed the significance of developing creativity and innovation skills in K-12 settings. Some participants emphasized that gifted students had a greater need to have classroom time and attention devoted to developing their creativity to challenge and meet their higher cognitive abilities. These views align with the current educational emphasis on creativity and innovation as a fundamental aspect of the learning process for gifted students (Gagné, 2005; Kim, 2008; Pfeiffer, 2016; Renzulli, 2005; Renzulli & Reis, 1997). Researchers have stressed that educators must believe in the importance of creativity in order to effectively foster it in their classrooms (Davies et al., 2013; Sak, 2004; Skiba et al., 2010).

Additionally, educators should go beyond simply believing in the importance of creativity and innovation to understanding the benefits of fostering these constructs in students (Forgeard & Kaufman, 2016). With regard to this point, participants in this study were found to be aware of and able to explain the benefits of developing skills related to creativity and innovation in their gifted students. They indicated that fostering creativity and innovation in K-12 school settings leads to short-term benefits, such as

engagement in learning, and long-term benefits for gifted students, such as more career opportunities for gifted students.

**Engaging learning experiences.** Gifted education educators in this study stated that fostering creativity and innovation leads to more engaging educational experiences for gifted students. They saw creativity as an essential piece of engagement that had the potential to make subject matter in school more interesting. Participants also indicated that using creativity as a vehicle to create more engaging learning experiences for students could result in more positive, supportive learning environments. Further, most of the participants said that when students are afforded the opportunity to engage in the creative process in school, they are more likely to develop both cognitive and psychosocial skills (e.g., critical thinking, self-efficacy). These views align with findings from other studies that contend fostering creativity leads to enhanced student engagement, cognitive and psychosocial skills (e.g., Beghetto & Kaufman, 2010; Hennessey & Amabile, 2010); and overall sense of well-being (Kim, 2008).

**Disengagement and underachievement.** Participants indicated that fostering creativity and innovation can help address boredom in gifted students that often leads to their disengaging and underachieving in school (Kanevsky & Keighley, 2003; Ritchotte & Graefe, 2017). They referred to the development of creativity as a way to address underachievement in some gifted students. They also discussed how the integration of more creativity-focused activities in schools as a way to make gifted students more engaged and motivated, could, in turn, prevent or reverse underachievement.

Participants' views were similar to those of Kim (2008) who found a lack of support for creativity in schools as an underlying cause of underachievement in some

gifted students. Encouraging creativity and other high-order thinking skills has the potential to create a school environment that is more challenging, engaging, and meaningful for gifted students, resulting in higher levels of academic achievement.

**Long-term benefits.** All participants indicated that fostering creativity and innovation in schools could result in long-term benefits for both gifted students and society as a whole. They mentioned that developing creative abilities in gifted students increases the likelihood that they continue to engage in creativity and innovation as adults. This is consistent with Sternberg and Lubart's (1995) finding that creativity should be nurtured in students, so they will develop into creative adults who solve problems in original and effective ways, and as a result become productive members of society.

Participants also stressed that fostering creativity in schools helps to prepare gifted students for future careers that value innovative ways of thinking and solving problems. They also noted that developing creative-thinking skills in K-12 schools is critical for students who desire to become future pioneers in a specific field, improving the lives of larger groups of people and possibly even changing the world. Craft (2003a) contended that the future accomplishments of students and the potential for those accomplishments to impact society on the larger scale have driven society's growing interest in developing creativity. Participants in this study referred not only to the importance of creativity and innovation in schools, but also showed an understanding of the potential long-term benefits of fostering creativity and innovation. Participants' awareness of the importance and benefits of creativity and innovation seems to be a result

of the advanced professional development in gifted education and creativity they had received.

### **The Creative Learning Environment**

Drawing from their experiences teaching and working with creatively gifted students, participants identified several characteristics as essential for any learning environment to serve as a positive setting for creativity and innovation. They also emphasized the critical role of creating a supportive learning environment for creativity and innovation that students need to feel safe, be comfortable sharing ideas, taking positive risks, and making mistakes is critical. These characteristics of a safe environment have been mentioned by other researchers in creativity. For example, Amabile and Gryskiewicz (1989) stated that it is important for individuals in the creative environment to avoid critiquing new ideas, discouraging positive risk-taking, and over-evaluating students' creative ideas.

Another aspect of the creative environment that participants mentioned is allowing for flexibility in the time allotted for students to develop their creative thinking skills and to work on creative projects. Imposing time restrictions on students during creative-thinking activities was a concern mentioned by a number of researchers who suggested providing flexible time instead (Addison et al., 2010; Burnard et al., 2006; Halsey et al., 2006; Jeffrey, 2006). Participants also stated that it is essential to create a non-restrictive environment that fosters creativity and innovation. As Wildauer (1984) noted, a flexible environment is important for encouraging students to think creatively since they are more likely to engage in the task at hand if they feel less pressured to conform to prescribed ways of completing their schoolwork.

In addition to describing the important characteristics of the creative learning environment, participants described several features of learning activities that foster creativity and innovation. Participants also mentioned that creative activities should be generative in nature, such as SCAMPER and Six Hats, and purposeful so that children understand the goals behind the activities and are motivated to complete them. Participants also indicated that children should have the chance to work collaboratively, believing that this would further support their creativity. While explaining the importance of creative-thinking activities, participants still emphasized the critical role of, first, providing a safe, flexible environment. They felt it was important for educators to understand the crucial role of building a positive learning environment for creativity and innovation prior to thinking about specific activities they could use to foster creativity (Garcês et al., 2016).

### **Barriers to Creativity and Innovation**

Although participants had a strong understanding of creativity and innovation and how to foster these constructs in gifted students, they perceived and encountered barriers to creativity and innovation in their experiences in K-12 settings. Participants discussed different obstacles they had experienced firsthand in the K-12 educational system, including negative perceptions and a lack of understanding of creativity on the parts of other educators, administrators, and parents; the limited time they had to foster creativity; and the restrictiveness of the school system. Participants found it difficult to create a classroom and school environment that supported the development of creativity and innovation because of other educators', administrators', and parents' resistance toward incorporating creativity in day-to-day learning activities. They stressed that cultivating

student creativity becomes most difficult when school administrators, in particular, hold negative beliefs toward creativity and innovation, since they help shape the school culture.

Participants also found it very challenging to support creativity and innovation as they felt they were overextended by other school requirements and did not have adequate time to foster these characteristics in their students. In addition, participants noted the structure of the school system, as a whole, is a huge challenge to fostering creativity and innovation in K-12 settings. They described how school systems that are too restrictive negatively impact teachers' efforts to foster creativity and innovation in their classrooms. More specifically, they mentioned school accountability, the prescribed curriculum, emphasis on grades and testing, and narrow academic standards as obstacles to developing gifted students' creativity in schools. These school system challenges have also been described by several researchers. Kim (2008) posited that the prominence of standardized assessment practices in schools may promote intellectual conformity, which makes it difficult for educators to promote student creativity and innovation. Sternberg (2006) highlighted that when educators are forced to meet narrow standards of accountability, this may diminish their ability to foster creativity in schools. In a recent systematic review of the literature on integrating creativity in schools, Bereczki and Kárpáti (2018) stated that the barriers that educators mentioned most frequently included the following: lack of time, lack of training, standardized testing, and fixed curriculum.

Adapting the school system to encourage school environments that welcomes creativity and innovation is essential to supporting not only gifted students, but all students. Further, addressing educators', administrators', and parents' lack of



understanding of creativity and innovation through professional learning needs to be a priority if change is to happen at the school level.

### **Hope for Supporting Creativity and Innovation in Schools**

**Leadership styles and professional development.** Gifted education educators shared some positive factors that may support the development of skills related to creativity and innovation in K-12 schools, in spite of the various barriers they mentioned. They stressed that the leadership of school administrators can play a vital role in helping teachers develop their students' cognitive and psychosocial skills related to creativity and innovation. Despite restrictive school systems and standards, most of the participants felt empowered when their school principals supported their efforts to foster creativity and innovation. Several participants specifically stated that their school administrators trusted them as experienced educators in gifted education and allowed them the freedom, authority, and time to embed opportunities for students to be creative and innovate in their classrooms. Participants appreciated their school administrators and felt they were working with them and not against them in the best interest of their gifted students. They noted appreciation for administrators who allowed them to be creative in how they addressed learning standards and trusted in their ability to do so without jeopardizing important content matter. Moolenaar, Daly, and Slegers (2010) indicated that when school principals are more flexible and closely connected to their teachers, allowing them to invest in change and new instructional practices, they help to create an innovative school climate. Further, Harris (2008) emphasized that schools need leaders who trust in and allow teachers to take on leadership roles in their areas of expertise; in other words, the hierarchical and restrictive models of leadership may not be appropriate for today's

schools any longer. Participants in this study found such distributive leadership styles to be very empowering for them in inspiring and cultivating creativity and innovation in their classrooms.

Not surprisingly, participants perceived that gifted education educators are more likely to receive professional learning opportunities in creativity and innovation as part of their gifted education preparation than general education educators. All participants indicated that they felt prepared and ready to foster creativity and innovation due to professional development and graduate-level coursework in gifted education and creativity. They felt these learning experiences were transformative for them and similar types of professional learning opportunities could help educators better infuse creativity and innovation in their classrooms and schools. Some of the participants reflected on their teaching experiences before and after engaging in training and said they used to approach creativity in ineffective ways due to their limited understanding of creativity. However, they felt much more prepared and knowledgeable about creativity and innovation and how to better foster these concepts in gifted students after having received professional development and/or completed graduate-level coursework.

Although this study's participants were fortunate to have received prior training in creativity, participants stated that not all gifted education teachers receive such training. They asserted that it should be a greater priority in school districts for all gifted education educators to receive training in creativity and innovation in order to better serve their students and to address common misconceptions many educators hold about creativity through professional learning. They noted that training in creativity, although critical for gifted education teachers, should be provided for all teachers given skills related to

creativity and innovation are in demand in the 21st century. The majority of studies in the literature have found that when teachers hold negative perceptions and misconceptions about creativity, it affects their teaching practices and how they approach creativity in schools (Berezki & Kárpáti, 2018; Mullet et al., 2016). Therefore, there should be an increasing demand in education to provide training on creativity and innovation to all pre- and in-service teachers.

**Science, Technology, Engineering, Arts and Mathematics ‘STEAM’**

**initiatives and advancement in technology hold potential and bring opportunities.**

Although there are numerous barriers to fostering creativity and innovation in K-12 schools, participants indicated that a newer trend in educational initiatives, STEAM, could bring more opportunities to integrate these concepts into schools. Some participants referred to STEAM in their discussions as being increasingly valued in schools and that applying this approach provided them with greater opportunities to foster creativity and innovation within the curriculum. Because STEAM allows students to creatively solve problems and have more practical learning experiences in schools, participants felt this approach should be capitalized on in schools to make curricula more engaging and challenging for all students, especially gifted students.

Further, participants viewed the advancement of technology as a very valuable addition in schools that had the potential to enhance skills related to creativity and innovation. Participants mentioned that technology offers various opportunities to better support creativity and innovation for gifted students in schools. Similarly, Cropley and Cropley (2010) explained that technology in education offers special opportunities for creativity because it allows students to generate a variety of pathways to solutions.

Participants stated that technology provides many platforms and tools that may be helpful for gifted students and encourage their creativity. They posited that technology makes it easier and provides more opportunities for students to create and innovate at a more advanced level, thus making learning experiences more meaningful and enjoyable for them. Since technology is being utilized more and more in schools, participants saw this as a practical, seamless way to embed creativity and innovation into schools without disrupting teachers' current instructional practices. A visual representation of the perceived factors that both positively and negatively affected participants' experiences fostering creativity and innovation in K-12 schools is presented in Figure 8.

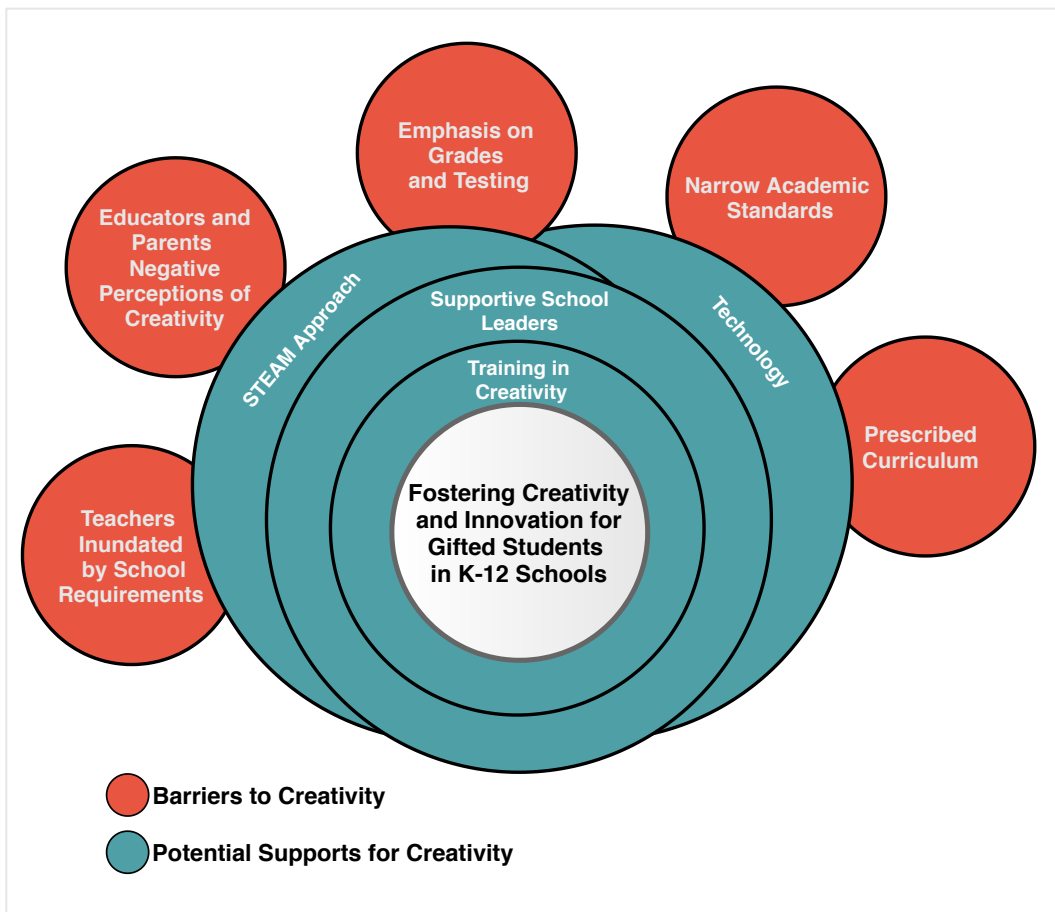


Figure 8. Perceived factors that affected gifted education educators' experiences fostering creativity and innovation in K-12 schools.

### **Implications for Practice**

The results of this study have several implications that can help educators and administrators in K-12 school settings better foster creativity and innovation for all students, including gifted students. Overall, results of previous studies have shown that educators generally hold negative and inaccurate perceptions of creativity that run against scholars' understanding of creativity. Based on suggestions from past researchers who studied educators' perceptions of creativity, this study focused on the perceptions of experienced gifted education educators who had all received advanced training in gifted education. Contrary to research focused on general education teachers' perceptions of creativity, participants in this study held positive and research-based perceptions of creativity and innovation. Further, participants were aware of the short- and long-term benefits of fostering creativity and innovation in schools. Additionally, similar to scholars in the field of gifted education, they emphasized focusing first on creating a positive learning environment that supports creativity prior to developing specific creative-thinking activities. These findings suggest the importance of providing professional learning on selected gifted education topics, including creativity. Although participants were trained gifted education educators, they indicated that not all their peers in gifted education receive such training and they reflected on their experiences with fostering creativity before having received training, stating that such efforts were not effective ones. Therefore, findings from this study suggest it is especially critical for educators working with gifted students to receive training specifically on creativity and innovation in order to effectively serve these students and meet their profound learning

needs. Further, based on the insights gleaned from participants in this study, it is vital that school administrators also receive professional learning in gifted education and creativity, more specifically, in order to foster a school culture that not only honors creativity, but also supports teachers' efforts to embed opportunities for their students to develop cognitive and psychosocial skills related to creativity and innovation.

Further, results of this study indicate there is a need to amend school policies to overcome challenges and barriers educators encounter when attempting to create a positive learning environment that encourages creativity and innovation. Strong emphasis on standardized testing and competitive scoring environments, where educators must primarily focus on increasing student scores, creates a serious challenge to helping students grow creatively. In addition, administrators should be willing to allow trained teachers to flexibly address academic standards in order to encourage more creativity and innovation in their classrooms. Teachers should also have adequate time to embed opportunities for creativity and innovation within the curriculum, so they can meet academic standards, while teaching creatively and encouraging more creative and innovative thinking from their students. Such efforts make it more likely that students will have a more enjoyable and engaging learning experience that will increase their motivation and passion for learning. These practices may also help gifted underachievers increase their motivation for learning through flexible, interesting, and challenging learning opportunities

This study also found that although traditional school systems may work against promoting creativity and innovation, current educational initiatives, such as STEAM, were perceived by the participants to encourage creativity and innovation by providing

students with practical and creative opportunities to solve problems and create authentic products. STEAM approach should be supported to be implemented in more schools, as they can create better, more inclusive school environments that meet the creative needs of not just gifted students but all students. Further, findings from this study suggested that advanced technology offer various opportunities to better support creativity and innovation for students in K-12 schools. It allows students to gain access to various effective creative tools and platforms and making connections with others who share similar interests. Table 4 presents recommendations for practice to better support fostering creativity and innovation in K-12 schools.

Table 4

*Recommendations for Practice*

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Recommendations
All gifted education teachers need training in creativity and innovation to better foster these constructs for gifted students in schools.
School principals need professional development opportunities about creativity and innovation to better support teachers in fostering creativity and innovation and creating a school climate that encourages students' creativity and innovation.
All pre-service and in-service teachers need training creativity and innovation to better understand these constructs, avoid myths, and learn how to foster them given the emphasis on 21 <sup>st</sup> century skills.
Schools should minimize emphasis on standardized testing and competitive scoring environments.
Principals should be willing to allow trained teachers to flexibly address academic standards.
Principals should allow teachers more time to embed opportunities for creativity and innovation within the curriculum.
The STEAM approach should receive more support and be applied thoughtfully in more schools as it provides potential support for creativity and innovation by providing students with practical and creative opportunities to solve problems and create authentic products.
Schools should support the sensible use of advanced technology as it offers various opportunities to better support creativity and innovation for students in K-12 schools.

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### **Limitations and Suggestions for Future Research**

This study purposefully included only trained and experienced gifted education educators in order to study their perceptions and experiences specific to creativity and innovation. Although there was diversity within this study sample in terms of length of teaching experience, type of gifted education position, and level of education, they were similar in that they all had some degree of training in creativity. Generally, all gifted education educators do not receive training in gifted education and creativity. Therefore, a limitation of this study is that the sample did not include the perspectives of untrained gifted education educators who may hold different perceptions compared to those of trained gifted education educators. Future research should investigate the perceptions of untrained gifted education educators with regards to cultivating creativity and innovation in K-12 school settings. Another limitation of this study is the race/ethnicity of the study participants, who all identified as White. In addition, most of the participants' teaching experience occurred in the state of Colorado. Future research should include participants from different cultural backgrounds and in different U.S. states, in order to explore more fully any differences that might exist in their perceptions and experiences of creativity and innovation.

Moreover, there is a need for a quantitative, cross-sectional survey study to investigate a large sample of gifted education teachers' attitudes and understanding of creativity and innovation in the K-12 school settings. Such a study should include the perspectives of both trained and untrained gifted education teachers, general education teachers, teachers from different states, and teachers with different cultural backgrounds. Further, future research should examine the effects of creativity (e.g., creativity-based



activities, modified creative curriculum, or STEAM-based teaching activities) on gifted students' motivation in learning and academic achievement.

Given that gifted students' voices are often missing in creativity research, future research should also explore gifted students' perceptions of creativity and innovation in schools and their perceptions of the relationship between exposure to creative-learning opportunities and their motivation to learn and achieve in school. Finally, the use of the photo-elicitation data collection method in this study to better understand participants' perceptions and experiences fostering creativity and innovation was found to be very effective when utilized along with one-on-one, semi-structured interviews. Future qualitative research may use this data collection method to triangulate data and encourage participants to share more open-ended, varied responses that may not have been shared through semi-structured interviews, alone. Table 5 presents suggestions for researchers related to fostering creativity and innovation in K-12 schools that to be considered for future research.

Table 5

*Suggestions for Future Research*


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Suggestions
There is a need for a quantitative, cross-sectional survey study to investigate a large sample of gifted education teachers' attitudes and understanding of creativity and innovation in K-12 school settings.
Future research should examine the effects of creativity (e.g., creativity-based activities, modified creative curriculum, or STEAM-based teaching activities) on gifted students' motivation in learning and academic achievement.
Future research should also explore gifted students' perceptions of creativity and innovation in schools and their perceptions of the relationship between exposure to creative-learning opportunities and their motivation to learn and achieve in school.
Future qualitative and mixed-method research would benefit from using the photo-elicitation data collection method to triangulate data and encourage participants to share more open-ended, varied responses that may not be shared through semi-structured interviews, alone.
There is a need to apply mixed methods research design to explore educators' perceptions of creativity and innovation in relation to their classroom practices in different contexts.

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**Conclusion**

Researchers in the field of creativity have emphasized the need to acquire a deep understanding of educators' perceptions of creativity and innovation. They see this as a priority that is necessary to help policymakers, administrators, and educators see the importance of fostering student creativity in schools (Cheung, 2012). Past research has also referred to the negative and inaccurate perceptions educators generally hold toward creativity, perceptions that run counter to scholars' theories of creativity, as a dilemma and obstacle to successful gifted education (Berezki & Kárpáti, 2018; Dawson et al., 1999; Mullet et al., 2016; Skiba et al., 2010; Westby & Dawson, 1995). Therefore, based on repeated recommendations found in the literature, this study included only the voices of experienced gifted education educators who had received training in creativity. This

study found that this group of trained educators held research-based, positive perceptions of creativity and innovation consistent with the explicit theories of creativity scholars. These types of perceptions are critical for educators to engage in fostering creativity and innovation for students in schools. The results of this study indicated that training in gifted education and creativity was a significant factor that allowed gifted education educators to understand the constructs of creativity and innovation more accurately and therefore, be better able to effectively embed learning opportunities focused on developing creativity and innovation in schools.

Further, this study also explored participants' experiences in K-12 settings and found specific barriers towards effectively fostering students' creativity and innovation. For example, the negative attitudes of other educators and parents toward creativity and innovation, such as these skills being expendable and unnecessary, were found to be one of the main obstacles to successfully integrating such concepts into education. Additionally, participants believed schools systems oftentimes put too great an emphasis on narrow academic standards, standardized testing, and test scores, all of which may suppress opportunities for students to be creative and innovative. It was also found that teachers do not have enough time and flexibility to embed creativity and innovation within instruction, due to prescribed curriculum and teaching styles that do not, in reality, allow students to create or innovate within the learning environment.

Although gifted educators indicated barriers that hinder creativity and innovation in K-12 schools, they also stressed that school leaders have the potential to minimize such barriers and to play a great role in encouraging more creativity and innovation when create a school culture that honors these concepts. Last, this study also found that recent

educational initiatives, such as STEAM and the integration of advanced technology in education has great potential to afford gifted and general education teachers more opportunities to provide creative and innovative learning experiences for not only identified gifted students, but for *all* students.

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**APPENDIX A**

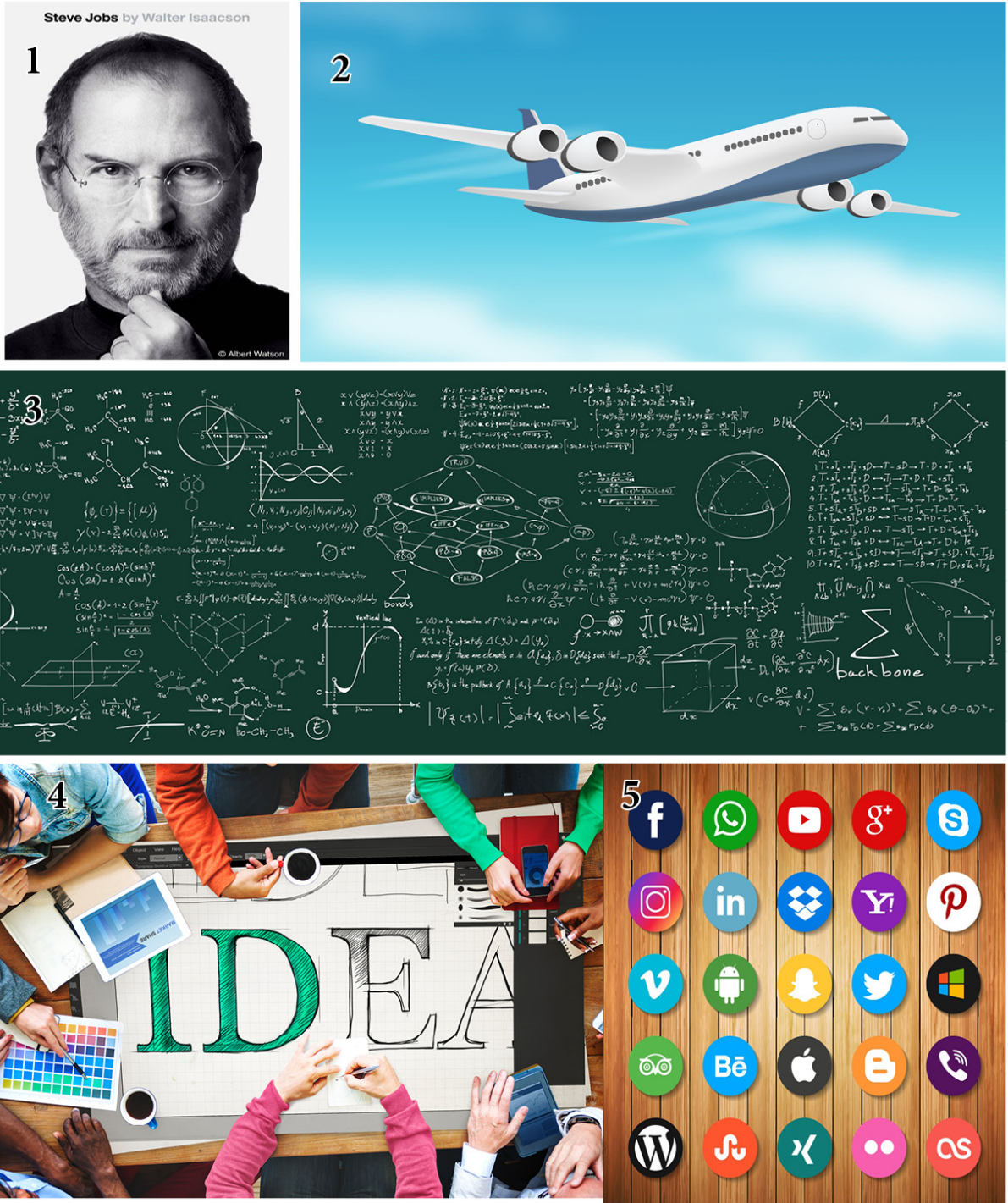
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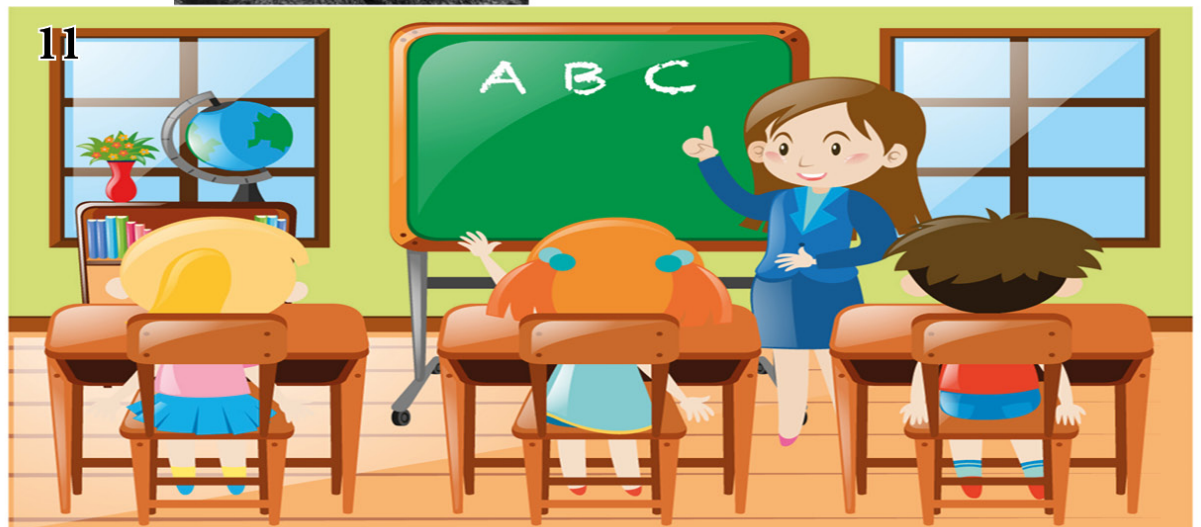
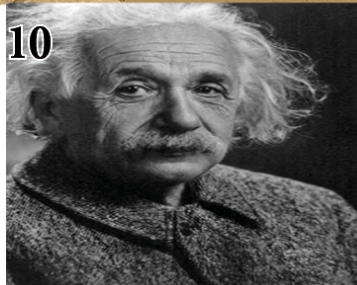
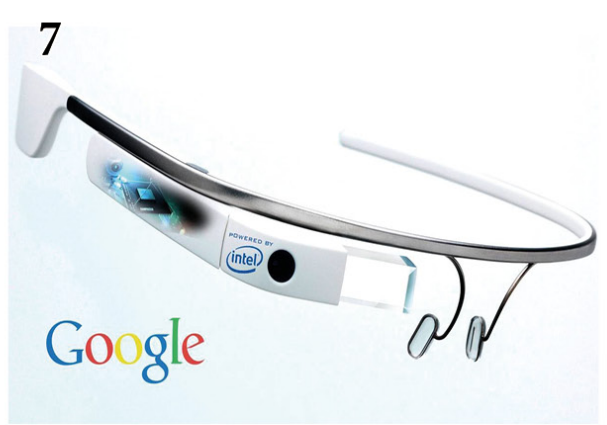


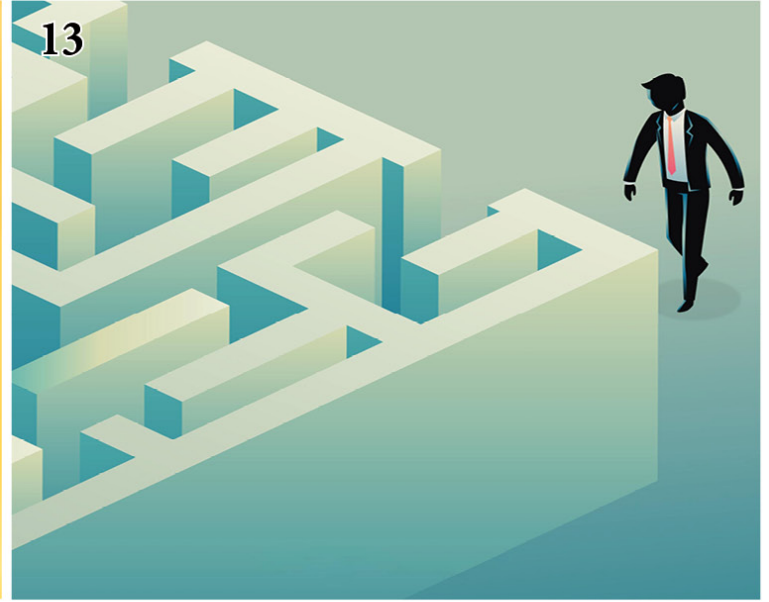
PHOTO-ELICITATION MATERIALS

1- Please select three images that you think best represent creativity and/or innovation. Please explain your choices.  
Selection One ( )                      Selection Two ( )                      Selection Three ( )

2- Can you identify any image that you think it does not represent creativity and/or innovation. Please explain your choices.









18 Let me stay a little longer  
 In this place I shouldn't be  
 If I linger here a few more moments  
 I finally might be seen  
 I want to be somewhere else sometimes  
 —Or someone else—  
 Impervious and free  
 Instead I always wind up here  
 In this place I shouldn't be  
 Lingering for far too long  
 Unseen  
 Waiting to be seen

Source: Eager Storms Can Wait by Jennifer A. Ritchotte



Source: Tesla.com

**APPENDIX B**

**DEMOGRAPHIC QUESTIONNAIRE**



### DEMOGRAPHIC QUESTIONNAIRE

1. Pseudonym:
2. Age:
3. Sex/gender:
4. Race/ethnicity:
5. How many years have you been teaching? How many years have you been teaching gifted students?
6. What are your gifted education credentials/training?
7. What grade/s do you teach?
8. Is there a specific content area you teach? Please explain.
9. What is your past and current experience teaching gifted students?

**APPENDIX C**

**INTERVIEW QUESTIONS**

RQ1: How do gifted education educators perceive creativity and innovation in general?

1. What is your own personal definition of creativity?
2. How would you define innovation?
3. How do you see the relationship between creativity and innovation?
4. To what extent does your personal definition of creativity and innovation differ or stay the same= if you are asked to apply it to teaching gifted students in K-12 settings?
5. What words or description(s) come to your mind when you think of a creative person?
6. What words or description(s) come to your mind when you think of a creatively gifted child?
7. What aspects of creativity do you think are most valued by society? Why? Do you agree? Please explain.
8. What aspects of creativity do you think are most valued in k-12 settings? Why? Do you agree? Please explain.
9. Please describe a setting that you believe would be most ideal to foster creativity and innovation for gifted students.

RQ2: What are gifted education educators' perceptions and experiences with creativity and innovation in k-12 settings?

1. How important do you think it is to make time during the week to foster creativity and innovation for gifted students? Please explain.
2. Should educators help create a school/classroom environment that fosters



creativity and innovation? How? Please explain.

3. What opportunities or experiences have you had fostering creativity and innovation in your classroom and/or school?
4. Do you see the act of teaching creatively and the process of developing a student's creative capability as different or the same? Please explain.
5. Do you think the evolution of technology has impacted gifted students' abilities/skills with regards to creativity and innovation? Why or why not?
6. What do you see as the possible short and long-term impact of teachers fostering creativity and innovation in schools?
7. Do you feel prepared to foster creativity and innovation in your school/classroom? Please explain.
8. Do you feel supported fostering creativity and innovation in your school/classroom? Please explain.
9. What are the challenges, if any, that gifted educators face in their efforts to foster gifted students' creativity and innovation in k-12 settings?
10. What kinds of supports (if any) do you think gifted educators need to better foster creativity and innovation for gifted students in k-12 settings?
11. What kinds of tools/resources do you feel that gifted students need to foster their creativity and innovation skills in k-12 settings?
12. Is there anything else you'd like to share about creativity and innovation?

**APPENDIX D**

**INSTITUTIONAL REVIEW BOARD APPROVAL**



*Institutional Review Board*

DATE: December 3, 2018

TO: Omar Alsamani  
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1349334-2] Fostering Creativity and Innovation in Gifted Students through the Eyes of Gifted Education Educators

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: December 3, 2018

EXPIRATION DATE: December 3, 2022

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or [nicole.morse@unco.edu](mailto:nicole.morse@unco.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

**APPENDIX E**

**CONSENT FORM**



UNIVERSITY OF  
NORTHERN COLORADO

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH  
UNIVERSITY OF NORTHERN COLORADO

**Project Title:** Fostering Creativity and Innovation in Gifted Students through the Eyes of Gifted Education Educators

**Researcher:** Omar Alsamani [redacted] [Alsa5773@bears.unco.edu](mailto:Alsa5773@bears.unco.edu)  
School of Special Education

**Research advisor:** Jennifer Ritchotte, Ph.D. [redacted] [jennifer.ritchotte@unco.edu](mailto:jennifer.ritchotte@unco.edu)  
School of Special Education, College of Education and Behavioral Sciences,  
University of Northern Colorado

Dear Participant,

I really appreciate that you agree to participate in this study and giving some of your valuable time. I am Omar Alsamani, the study primary researcher, asking for your informed consent to participate in an interview involving questions about teachers' perceptions and experiences of creativity and innovation such ones in the Appendix B. The purpose of this study is to better understand gifted education educators' perceptions and experiences of fostering creativity and innovation for gifted students in K-12 settings.

This interview should last somewhere between 45 to 60 minutes. I will ask for your interpretations and/or perceptions of past and present experiences with your gifted students regarding creativity and innovation. The interview will be conducted face to face at a location that is convenient to you or through other means such as phone call or Skype. For the purpose of reviewing the interview, an audio recording will be used during the interview. At any point during the interview that you would like to stop recording, please inform the researcher and your recording will be stopped.

Any recording made by the researcher will be considered private and respected by the researcher. The transcriptions and recordings will be stored for a period of three years on a locked password protected personal computer at which time audio-recordings will be erased and signed consent forms destroyed. As an effort to achieve confidentiality of your responses I will be giving you a pseudonym for the recording and transcriptions of this interview.

Participation is voluntary. You may decide not to participate in this study and if you begin participation, you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in a loss of benefits to which you are otherwise entitled. Please retain this consent form for your records and future reference. Please sign below if you consent to participate in this research. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970- 351-1910.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_