Exploring Instructors' Creativity Fostering Behaviors in Design Education

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Abstract

Creativity is an important source of implementation of innovation and economic aspects (Hondzel & Catharine, 2013; Ucus & Acar, 2018). The benefits of creativity can be seen in both individuals and society; it is one of the vital aspects that move civilization into the future (Hennessey & Amabile, 2010). There are many advantages of creativity development in educational settings. Creativity increases students' personal engagement, leads to student satisfaction, increases their self-efficacy, plus encourages and supports students' learning success (Robinson, 2001).

Teachers play a significant role in students' development, whether related to their skills, knowledge, or personality, and creativity is vital in this process of learning. Fostering creativity in the classroom cannot be understood without understanding teachers' roles, beliefs, practices, and behaviors related to creativity.

The present study explores the concept of fostering creativity in higher education and investigates design instructors' practices, creativity behaviors, and beliefs. The goal of this study is to explore these creativity factors in three ways. First, by examining the related literature. Second, by conducting a quantitative investigation that measures the design instructor's creative behaviors using the CFTIndex. Third, by conducting a qualitative investigation that identifies design instructors' creativity beliefs and practices. The research questions for this study are:

1. What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom?
2. How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses?

3. What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

The mixed-method approach was implemented in two phases. In the first phase, creative instructors were selected by using Soh's (2000) Creativity Fostering Teacher Behavior Index (CFTIndex). A total of 41 participants participated in this study; however, only 37 participants completed the survey. In the second phase, interviews were conducted to investigate design instructors' creativity beliefs and practices. Invitations were sent to 34 participants, and 11 agreed to be interviewed. Six of those participants were teaching studio classes, three teach lecture classes, and two teach both studio and lecture classes.

The semi-structured interviews were conducted by Zoom. Each interview took one-hour minimum. For data analysis, NVIVO software was used to organize the relationships between design instructors' creative behaviors, beliefs, and practices and how they are defined in design education. The data analysis included obtaining descriptive statistics and a T-test to compare the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach non-studio classes. The knowledge that emerged from interviewing the instructors about creativity teaching and practices resulted in five major findings. First, design instructors define creativity as a multifaceted phenomenon, and creative instructors share the attributes of being motivated, enthusiastic, and flexible, as well as having an open mind and empathy for students.

Second, design instructors believe creativity is required in the design field, and enhancing students' creativity is important in the classroom. Third, there are several activities and

practices that design instructors apply in their classroom teaching to foster students' creativity, and these practices can be evaluated and assessed in multiple ways. Fourth, there are several factors influence creativity in classroom practices, most notably related to educational institutions, classroom environments, student experiences, and other factors beyond school. Fifth, when instructors gain more years of teaching experience, they see themselves as more likely to motivate students and demonstrate more creative behaviors to enhance creativity.

This study does not aim to evaluate design instructors' creativity teaching behaviors. Rather, this work synthesizes the experiences of enhancing creativity in design education and broadens the knowledge about the impact of teachers' creativity behaviors on design students and the effect of these creative practices. This study focuses on defining the phenomenon of fostering creativity in design classrooms, by identifying the practices and beliefs that design instructors hold about creativity, and how those are influencing their performance of creative behaviors. The results of this study are relevant to educators who are interested in enhancing students' creativity in the classroom.

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Chapter I: INTRODUCTION

Introduction to the Study

Fostering creativity is an integral part of education and should be a guiding principle for teaching…. It should not be reduced to a collection of set exercises carried out at fixed times as part of a 'creativity program' … The desire to foster creativity is at the heart of a philosophy or principle that should underlie all teaching and learning in all subject areas and at all times (Cropley, 2001, p. 151).

Creativity is one of the one of humanity's essential factors, a contributor to innovation, and an influential learning aspect. Since creativity has a great impact on information evolution, it's become one of the most important areas of exploration in organizational settings and education (Cropley, 1997; Sternberg, 1999; Amabile & Pillemer, 2012; Runco, 2014). Several investigations have shown that creativity can be applied in different educational settings (Beghetto & Kaufman, 2010; Cropley, 2011; Bereczki & Karpati, 2018). Creative abilities can be promoted by utilizing effective instruction and guidance (Isaksen & Treffinger, 2004; Renzulli, et al 2007; Hennessey & Amabile, 2010). Despite all the attention that has been given to creativity development, classrooms still have a hard time "accommodating students' creative development" (Bereczki & Karpati, 2018, p.1).

According to Lewis, the domains based on technology education such as art, design, physical, and music education require students to learn more than knowledge of the class materials, particularly technical skills, or proper usage of tools or instruments

(Lewis, 2005). Students need to go beyond these learning stages to pursue "more subjective and elusive goals," and among these, he includes "creative insight" (p. 35). Lewis also stated design teaching is "… almost ideally suited to uncovering dimensions of the creative potential of that would remain hidden in much of the rest of the curriculum" (p. 43), and that is related to the attribute of design and what he called "open-endedness" (p. 43). This is one of the conditions that promote creativity, which means there is "an inherent link between design education and creativity" (Cropley, 2009, p. 346). However, teachers are still challenged by the question of how to make design students creative and what are the best methods to use to foster creativity.

There are many advantages of creativity development in educational settings include: increasing students' engagement, leading to student satisfaction, increasing their self-efficacy, and supporting their learning (Robinson, 2001). Creativity stimulates students' divergent thinking, facilitates their solving problems skills, and helps them to come up with new ideas or solutions (Brown, 2017). When creativity is blocked, students' development may be reduced, and they begin to doubt their learning and achievement.

Teachers hold different beliefs about creativity, and these beliefs influence how they teach creativity. Teachers' creativity beliefs are formed by several personal and environmental factors (Sternberg & Lubart, 1991; Amabile, 1996; Csikszentmihalyi, 1996; Plucker, et al., 2004). These beliefs were shown to be implicit or explicit (Kagan, 1992; Kaufman, Storm, Sawyer, Pianta, & Laparo, 2006). The successful implementation of creativity in education is relieze on teachers' beliefs about creativity and its nurture (Bereczki & Karpati, 2018). For this reason, it is essential to investigate and understand

teachers' creative beliefs and practices because of their significant value in the identification, development, and evaluation of creativity in education (Bereczki & Karpati, 2018).

From 1980 to 2016, there were 65 studies published on teaching creativity in art and design (Sawyer, 2017). The current literature on developing creativity focuses on identifying, describing, and synthesizing teachers' creativity beliefs and practices. Between 2010 to 2015, there has been extensive research on K-12 education; around 53 studies were published on teachers' creativity beliefs (Bereczki & Karpati, 2018). There has been significantly less emphasis on higher education. This shows the need for more investigation on creativity in higher education and teachers' creativity classroom practices (Lau, 2009).

Few studies have investigated higher design education (Demirkan & Afacan, 2012). Scholars in the field of creativity and design education have stressed the significant need for investigation into creativity and students' learning (Sternberg, 1999; Cropley, 2011; Jahnke, 2011). Previous studies on investigating creativity in education were concentrated on the areas of Engineering, English, Chemistry, Mathematics, and other technical fields (Aljughaiman & Mowrereynolds, 2005; Cropley & Cropley, 2005; Lee & Kirsten, 2014; Soh, 2015; Dikici & Soh, 2015). For example, the Council of Interior Design Accreditation (CIDA) 2010 standards indicated that teaching programs must educate their proficient students who will be professionals in the future in creative thinking and problem-solving. Despite the importance of creativity in interior design, very few studies have explored this topic in interior design specifically or design education in general.

The scholars in the field of design agree that the design field has many opportunities for creativity training, because of the different possibilities and activities that involve designers to generate ideas, solve problems, and make decisions to achieve specific goals. According to Pedersen & Burton, “creativity was viewed as a key component of original and useful design solutions. Developing creative thinking has been an essential part of design and education” (2009, p. 29). Portillo stated that in the interior design domain, the demand for creativity is increasing: “Heightened creativity will enable design students to become more effective as the demands of the (interior design) profession increase” (1996, p. 15).

In design education, lectures and studio classes are two approaches of teaching students. Some educators consider studio classes the ideal educational setting for students learning (Duzenli, Alpak, Cigdem, & Tarakci, 2018). The teaching environment of studio classes contributes to design education and offers students opportunities for gaining knowledge, developing their skills, and expressing their ideas (Duzenli et al., 2018). Moreover, in design studios, several teaching methods and practices could be applied to enhance students' learning and creativity. In the studio classes, students have the advantage of interaction with their instructors and classmates, and involvement of direct visual, verbal, tactile, written, and communication potential. Several teaching methods and practices could be applied to enhance students' learning and creativity in studio settings. Regardless of how much activities, knowledge, and creativity enhancements students could gain from studio classes, non-studio classes are also taken, which could be sometimes less engaging or effective.

Many studies agree creativity can be taught, developed, fosters, and improved (Torrance, 1968; Cropley, 1992; Amabile, 1996; Kaufman & Beghetto, 2009; Baer & Kaufman, 2008). The studies of creative design have emphasized the critical role of design activities in students' development to improve their creative thinking skills (Lau, 2009). Thus, several educators have proposed several methods to nurture creativity in the educational environment (Amabile, 1996; Fleith, 2000; Kaufman & Sternberg, 2010). For example, Sternberg (1999) claimed students' creativity can be activated through positive and forward-thinking. Addison and Burgess (2000) stated integrating risk-taking in students' learning develops human creativity, especially in art and design training. Cropley (1997) identified the comprehensive nine factors for creative teaching behaviors which are independence, integration, motivation, judgment, flexibility, evaluation, questions, opportunities, and frustration. Yet, design educators find it challenging to know which one of these methods is ideal for fostering students' creativity, and which learning activities are ideal for enhancing students' creativity.

It is widely known instructors impact students' learning in several ways (Torrance, 1968; Cropley & Cropley, 2009; Kim & Schallert, 2011). However, it has not been well identified what kind of behaviors, attitudes, and practices develop students' creativity in the design classroom. Research has shown that there are certain factors that influence teachers' creativity in classroom practices. These factors influence how teachers conceptualize creativity and are related to teachers' creativity beliefs, personality characteristics, and behaviors (Bereczki & Karpati, 2018). The focus of this study is to examine the practices and perceptions of design instructors in higher education and their creativity-fostering behaviors. Moreover, this study seeks to compare the creativity-

fostering behaviors test results for instructors who teach studio classes with those who teach non-studio classes.

It is well recognized teaching creativity has a positive impact on students. But, what are the beliefs, practices, and creative behaviors that design instructors apply in their teaching that foster students' creativity in the classroom? How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses? What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results? More investigation is needed to identify the important practices that are related to enhancing creativity.

Statement of the Problem

Little attention has been given to studying instructors' behaviors and practices that enhance students' creativity in design at higher education (Demirkan & Afacan, 2012). The literature on teaching creativity in art, design, and studio classes is limited to forty-five papers on research in higher education as of 2016 (Sawyer, 2017). Most of them focus on studio pedagogy, learning outcomes, and assessments. Very few searches investigate the practices and behaviors that foster creativity. In contrast, previous investigations that studied creativity mainly focused on creative skills, creative processes, the creative personality, measuring creativity, and creativity levels.

Design education requires creativity in both everyday activities and curriculum (Cropley & Cropley, 2010), yet there is a lack of research on creativity in design education (Demirkan & Afacan, 2012). The researcher's personal experience found that instructors hold different beliefs about facilitating students' creativity in the classroom.

Some instructors misunderstand or hold negative perceptions about creativity or believe that creativity shouldn't be forced. Other instructors believe that creativity should be taught and trained. No research investigation has yet been undertaken to understand design instructors' views on creativity.

Previous research indicates that there is a significant gap in our understanding of what perceptions teachers hold of their role in fostering creativity (Soh, 2000). In order to improve design education and promote students' creativity, it is important to both identify and understand the creative activities and practices that design instructors use in their classrooms to nurture students' creativity (Mumford & Moertl, 2003). For this reason, researchers must investigate both instructor's beliefs about creativity and their classroom practices that enhance students' creativity to improve students' learning.

The initial pilot study revealed some instructors believe creative abilities are limited to students' development skills or just related to many personal aspects. Teachers may believe creative abilities to be fixed or determined by other individual factors. These concepts influence instructors' creative teaching practices and explain why some teaching results are more effective than others. Research is needed to understand instructors' perceptions of enhancing creativity and discover the reasons behind these views—whether they are related to the teaching institution, classroom environment, personal beliefs, characteristics, or experiences. It is also critical to understand how expert instructors involve creative behaviors in their teaching. Based on the initial pilot study, practicing and fostering creativity could lead to effective education. Exploring the beliefs which design instructors hold about enhancing creativity in design education is vital to

answering the second question of this study, how do design instructors foster creative behaviors and attitudes in their teaching.

Research Questions

Most existing studies on promoting creativity in design education have not explained or identified the practices design instructors demonstrate in their teaching that enhance creativity. To identify these creative teaching practices, more investigations must be carried out. The purpose of this study is to investigate three questions:

1-What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom?

2-How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses?

3-What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

Purpose and Description of the Study

Teachers play a significant role in students' development, whether related to their skills, knowledge, or personality, and creativity is vital in this process of learning. The literature review following reveals many studies have discussed different aspects of creativity regarding its nature, components, characteristics, processes, and more. However, the investigation into the role of instructors in students' development of creativity appears to be limited (Soh, 2018) and explicitly lacks in design education. The purpose of this study is to explore the concept of fostering creativity in higher education and to compare the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach lecture classes. Soh's (2000) CFTIndex test will be

used to measure instructors' creativity-fostering behaviors. The data will be collected via teacher-participant surveys and interviews. The data for each question in this study will be collected as follows:

1) To explore the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom, the data will be gathered through in-depth interviews.

2) To understand the differences in creativity fostering behaviors between design studio instructors who teach studio vs. non-studio classes, the data will be gathered through the CFTIndex and the in-depth interviews.

3) To investigate design instructors' creative behaviors that are demonstrated in their teaching in the classroom that align with and go beyond their CFTIndex results, the data will be gathered through in-depth interviews.

This study does not aim to explore the impact of teachers' creativity behaviors on design students and the effect of these creative practices. Instead, this study focuses on defining the phenomenon of fostering creativity in design classrooms by identifying the practices and beliefs that design instructors hold about creativity and how those are influencing their performance of creative behaviors. The results of this study will provide guidelines for future research and for educators who are interested in fostering students' creativity in design education.

Significance of the Study

Creativity is beneficial for society and culture (Simonton, 1991). It plays an essential role in technological development, social and behavioral disciplines, and the humanities and arts (Pomorski & Dudek, 2003). Because of the role of creativity in

innovation and students' development, creativity must become one of the important notions that teachers consider in their teaching.

This study would assist design teachers and help them to recognize more methods and practices for influencing student's creativity (Meneely & Portillo, 2005). The literature review in Chapter 2 shows the gaps and concerns about developing creativity in education. It reveals the current knowledge and studies on fostering creativity in the design domain need additional exploration. Moreover, the review shows a lack of research on creativity in design education (Demirkan & Afacan, 2012).

This research investigates teachers' beliefs about creativity and their creative practices to develop students' learning. For this reason, this research can be helpful for design educators who are interested in nurturing creativity in the classroom. Also, the results and the insights of this research would help teachers when they develop class exercises or activities. It would assist design teachers and help them to develop more methods and practices for influencing students' creativity (Meneely & Portillo, 2005).

Although there are great benefits of creative instruction on student learning, there is little attention in the literature on teaching creativity (Newton, 2013). This study will be more comprehensive, using multiple approaches, unlike previous studies, thus providing the researcher with sufficient information about the participants' creative practices. For instance, the constructed interviews will allow design instructors to discuss and explain their own creativity beliefs from their own perspectives. Discussing their perceptions and practices in detail will increase our knowledge and our understanding of the results. The outcomes might inspire instructors to re-evaluate their teaching exercises and lesson objectives.

This study is significant for different stakeholders, including instructors, researchers, and educators interested in teaching and developing creativity in the classroom, particularly in design and other fields. Besides, this study would be valuable for educational organizations, professionals, students, and teaching development personnel. The results of this research will provide several strategies and methodologies that could enhance students' creative skills. Identifying teachers' creativity practices will provide a better learning experience to design students and increase the effectiveness of teaching. It is anticipated that this study will provide a deep understanding of design teachers' creativity beliefs and initiate a further inquiry into creative practices in the field of design. This investigation will also reveal if design instructors who teach studio perform more creativity practices than those who teach non-studio classes. Significantly, this detailed investigation would enable design educators in higher education classrooms to select the suitable strategies applicable to their teaching context and objectives.

Role of the Researcher

The notion of this study is based on the researcher's roles, interests, and observations through her learning journey and comparing the educational differences and experiences that have developed in the Middle East and America. This study allowed the researcher to integrate two of her passions: education and creativity. Through the researcher's learning path, she was involved in several positions: a student who studied Art, Education and Design; a teacher; a designer; and a researcher. Observing the remarkable variation of teaching instruction styles, including a range of behaviors, attitudes, personalities, practices, exercises, curriculums, environments, beliefs, and objectives, sparked the interest to explore creativity in-depth in design education.

Furthermore, the pilot study results conducted by the researcher of this study on creative beliefs and practices among Graphic Design Instructors at the University of Minnesota provided valuable insights for this study design. One of the significant results of the previous study showed that Graphic Design Instructors were classified into two groups: active creativity teachers and passive creativity teachers. Both believed creativity is essential in design education; however, each group's classroom behaviors, personal characteristics, attitudes, and practices were different. These results guided the researcher to identify, evaluate and select the sample population. Moreover, they guided this research in terms of developing questions and deciding on the best methods and instruments that can be used to answer these questions.

Definition of Significant Terms

1. **Creativity** is defined differently among scholars.

- Robinson (2005) defines creativity as a process for producing and generating original and valuable ideas, and this definition might be considered original and beneficial.
- Plucker, Beghetto, Dow state that creativity is "the interaction among aptitude, process, and the environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context" (2004, p. 90).
- Runco (2014) describes creativity as a unique human characteristic that reflects an individual's ability to adapt or change circumstances, which impacts the cognitive abilities of students' new ideas.
- Cropley (1992) explained creativity as a learning aspect that individuals can be taught through motivational, emotional, and intellectual approaches.

- Sternberg & Lubart (1996) define creativity as being “in the personality, the process, and the product within a domain in interaction with genetic influences and with optimal environmental influences of home, school, community and culture” (p. 392).

2. **Creativity-Fostering Behaviors.** Behaviors are “the mechanism by which a teacher can encourage or discourage student creativity, intentionally or inadvertently” (Soh, 2000, p.119).

3. **K-12:** This is a short term used in education in the United States, indicating the publicly supported school grades before college. These grades are kindergarten (K) and the 1st through the 12th grade (1-12); these years are also referred to as early years’ education, primary school (1-6), middle school (7-8), and secondary school (9-12).

4. **Higher education:** This term in this study refers to college or university’s education level.

Overview of the Research Study

There are many advantages of creativity development in educational settings. Creativity increases students’ personal engagement, leads to student satisfaction, increases their self-efficacy, plus encourages and supports students’ learning success (Robinson, 2001). Teachers play a significant role in students’ development, whether related to their skills, knowledge, or personality, and creativity is vital in this process of learning. Fostering creativity in the classroom cannot be understood without understanding teachers' roles, beliefs, practices, and behaviors related to creativity. The present study explores the concept of fostering creativity in higher education and investigates design instructors’ practices, creativity behaviors, and beliefs.

Chapter 2 presents the literature review which overviews creativity and the value of teaching creativity in education. The review discusses the existing knowledge about teachers' beliefs, personality characteristics, and behaviors. The review also explores the differences and similarities between instructors' beliefs and their support of creativity and classroom practices. This chapter establishes the need for further research into how design instructors' beliefs, practices, and creative behaviors foster students' creativity.

Chapter 3 describes the study's mixed methodology, which includes the quantitative approach using a survey and the qualitative approach using interviews to answer the research questions. The chapter also explains the data collection methods, the sample, instruments, ethical considerations and study limitations.

Chapter 4 presents the data analysis and the important discoveries of the qualitative and quantitative data in this study. The chapter showcases the eleven interviewees' voices and opinions about teaching creativity. The findings also explores the connections between the instructors' beliefs and practices, and reveal these themes through descriptive interview data.

Chapter 5 includes the discussion and the meaning of the findings, limitations, and implications of this study. The discussion includes conclusions about teaching creativity in the design classroom. This section also includes recommendations for future study.

In conclusion, this study does not aim to evaluate design instructors' creativity teaching behaviors. Rather, this work synthesizes the experiences of enhancing creativity in design education and broadens the knowledge about the impact of teachers' creativity behaviors on design students and the effect of these creative practices. This study focuses

on defining the phenomenon of fostering creativity in design classrooms by identifying the practices and beliefs that design instructors hold about creativity, and how those are influencing their performance of creative behaviors.

Chapter II. Literature Review

Literature Review

The creativity developing practices, beliefs, and behaviors that design instructors use in their classrooms are not well known. This study asks the following questions: What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom? How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses? What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

To begin to answer these research questions, this chapter discusses and categorizes the relevant studies in the following four areas:

1- Creativity and education.

2- Teachers' beliefs, personality characteristics, and behaviors.

3- The gap between instructor's beliefs and classroom practices.

4- The measurements used to evaluate teachers' creativity and behaviors.

Introduction to Creativity

For many years theorists (Sternberg & Lubart, 1996; Amabile, 1996; Epstein, 1996; Csikszentmihalyi, 1996; Sternberg, 1999; Cropley, 2000; Sawyer, 2012; Runco, 2014) have been trying to explain creativity (Amabile, 1996; Tsai, 2012) but find it challenging because of the complex structure of creativity (Amabile, 1996; Runco, 2014; Tsai, 2012; Mullet, Willerson, Lamb, & Kettler, 2016).

Rhodes (1987) viewed creativity from four different perspectives: product, process, person and press of the environment. These four concepts became an essential cornerstone for any kind of creativity research.

The variety of explanations of creativity is related to researchers' investigations, questions, and study results. Many of the base explanations share a theoretical consensus around concepts, attributes, characteristics, and themes. For example, Sternberg and Lubart (1999) define creativity as "the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful concerning tasks constraints)" (p.3), which is comparable to Runco's (2014) explanation that creativity is a unique characteristic that reflects individual ability to adapt or change circumstances that affect the cognitive abilities to integrate or evolve ideas. On the other hand, (Gitomer, 1989, as cited in Kaufman & Beghetto, 2009) indicated creativity as "a desired quality for admissions to graduate school" (p.1).

Cropley (1992) looked at creativity as a learning aspect that individuals can be taught through motivational, emotional, and intellectual approaches, while Guilford (1950) sees it as a measurable construct. Piirto (2010) implies that "Creativity is in the personality, the process, and the product within a domain in interaction with genetic influences and with optimal environmental influences of home, school, community and culture" (p. 392). All the previous explanations conceptualize various levels of creativity, which is the concept that suits the idea of investigating creativity in a classroom.

Robinson (2005) defined creativity as a process for producing and generating original ideas that are valuable. Plucker et al., state that creativity is "the interaction among aptitude, process, and the environment by which an individual or group produces

a perceptible product that is both novel and useful as defined within a social context" (2004, p. 90). These last two definitions provide an optimal example for examining creativity and its influences on teaching in classrooms. To address creativity in higher education from an integrative perspective, these definitions will be used to identify creativity in this study.

Classrooms have been considered as the privileged position for encouraging students' creativity (Runco, 2004; Cropley & Cropley, 2009; Morais & Azevedo, 2011). Researchers Rhodes (1987) and Torrance (1968) emphasized the importance of creativity in teaching. Cropley (2005) stated there is a strong connection between design education and creativity. This link is related to the special characteristics of design education which are called "open-endedness" (Lewis, 2005, p. 43). The new technology in the education fields required design instructors to teach more than the basic knowledge of subject materials, or technical skills and techniques (Lewis, 2005). Design educators need to go beyond these basic concepts to pursue "more subjective and elusive goals" to generate "creative insight" (p. 35). Despite all the indications that have been given by researchers about the importance of enhancing students' creativity, classrooms still have a challenge of teaching creativity and a hard time accommodating design students' needs to encourage them to be more creative.

The Value of Teaching Creativity / in Education

Creativity is an important source of implementation of innovation and economic aspects (Hondzel & Catharine, 2013; Ucus & Acar, 2018). The benefits of creativity can be seen in both individuals and society; it is one of the vital aspects that moves civilization into the future (Hennessey & Amabile, 2010). Innovation is one of the

primary assets for human development, associated with different fields that invent or improve products, processes, services, technologies—and related to domains in technology, design, economics, business, and entrepreneurship (Andiliou & Murphy, 2010; Hondzel & Catharine, 2013; Ucus & Acar, 2018). There are several differences between innovation and creativity. Innovation is defined as introducing or applying new applicable ideas to a useful product, process, or service through economic, social, or technological aspects (West & Richards, 1999). In education, both innovation and creativity are required to complement the growth of students' competent and productive learning. Creativity is not a cognitive phenomenon related to intelligence (Cropley, 1992); it is a learning process that people may adopt by developing motivational, intellectual, and emotional approaches, which is the focus of this study.

Scholars agree creativity improves human life and individual performance in healthy psychological ways. Creativity helps individuals to take better advantage of opportunities and to respond more productively to the challenges and difficulties in their personal and professional lives. Researchers opine there are many beneficial effects for societies that value creativity; for instance, it leads to an increase in positive socio-economic factors, it raises living standards, and it offers prosperity for more people (Ministry of Research and Innovation, 2008; Council of Canadian Academies, 2009; Manley & Lucas, 2010; Runco,2014; Sharma & Sharma, 2018). Adapting creative behaviors gives individuals feelings of satisfaction and pleasure, which are major factors of emotional welfare and mental health (Alencar & Oliveira, 2016; Alencar, Fleith, & Pereira, 2017). In addition, creativity offers favorable resolutions for conflicts and amplifies knowledge development (Hennessey & Amabile, 2010; Mullet et al., 2016).

Creativity addresses many issues in different areas of innovation, individuals, society, and education. Enhancing creativity is considered an essential learning skill for life, professional development, and active interaction or collaboration (Sternberg & Lubart, 1996; Runco, 2004; Moran, 2010; Tan et al., 2016). Encouraging creativity is an excellent method for solving problems in particular domains because it stimulates the mind through divergent thinking processes for problem-solving and gives a sense of achievement and self-efficacy (Csikszentmihalyi, 1996; Feldman & Benjamin, 2006; Beghetto, 2006; Moran, 2010; Mullet et al., 2016). This dynamic process benefits students' achievement and encourages ideas, which all promote self-initiated learning. To gain these social and economic advantages of creative abilities, creativity must be taught, developed, and encouraged in the educational environment through creative instruction for students' future professions. Creative instruction is an important aspect of developing creativity, and it has significant advantages to students' learning (Jeffrey & Craft, 2004; Beghetto & Kaufman, 2010; Newton, 2013; Sternberg, 2015). To justify the significance of developing creativity in higher education, Jackson (2006) stated that if "the purpose of higher education is to help students develop their potential as fully as possible at this level, then enabling students to be creative should be an explicit part of their higher education experience" (p. 1).

In design education, lectures and studio classes are two approaches of teaching students. Design studio classes offer an ideal educational setting for students' learning. Duzenli et al. (2018) stated in-studio classes, students are engaged with several activities, where the acquired knowledge and skills are integrated and applied. Studio classes offer students several opportunities for gaining knowledge, developing their skills, and

enhancing their creative ideas (Duzenli, Alpak, Cigdem, & Tarakci, 2018). In design studios, several teaching methods and practices could be applied to enhance students' learning and creativity. Students develop many skills and gain several advantages of interaction with their instructors and classmates, and involvement of direct visual, verbal, tactile, written, and communication potential. The interaction in the design studio environment could provide more learning experience to students than non-studio classes.

Higher education teachers need to consider the important role of creativity in the process of teaching and preparing students for the complex world that will require their creative abilities. Therefore, teachers are advised to promote creative thinking through strategies, methods, exercises, and instruction that address and develop students' creative abilities.

Regardless of the value and advantages of creativity in teaching, still, there is a lack of attention and challenges in developing creative abilities for college students. In the higher education context of teaching and learning, creativity is usually underestimated (Jackson, 2006; Csikszentmihalyi, 2007; Alencar et al., 2017). According to Fryer (2007) creativity has been undervalued and under-recognized in many disciplines in different universities. There is much evidence suggesting that students' creativity declines with years in formal education (Castanho, 2000; Csikszentmihalyi, 2007; Alencar, Fleith, & Pereira, 2017). This decline of students' creativity is related to teachers' limited creative behaviors, opportunities, and knowledge of creative approaches in teaching (Alencar et al., 2017). Since most higher education institutions' missions give value to critical thinking, it is important to emphasize teaching creativity more.

The purpose of this study is to explore teachers' creative characteristics and practices that support students' creative learning in the classroom. In this context, the focus is to discover how teachers are creating a creative supportive environment for students.

Distinguishing between Creative Teaching and Teaching Creativity

Exploring creativity in education became an interesting topic of research after Guilford's presidential speech in 1950 to the American Psychological Association (Sawyer, 2011). Since then, many researchers have investigated human creativity behaviors in education and training. Cropley (1992) and Torrance (1963) stated that the pedagogy of teaching for creativity should focus on facilitating learners' creativity and engagement. Using different teaching practices encourages students to learn or to discover multiple new possibilities of thinking in inventive and motivating ways. Creative instruction and teaching for creativity were associated with each other as one concept until 1999 (Jeffrey & Craft, 2004). The National Advisory Committee on Creative Cultural Education initially stated that "teaching for creativity involves teaching creatively," and the creative abilities for young people are certain to grow "in an atmosphere in which the teacher's creative abilities are properly engaged" (NACCCE, p. 90 1999).

Later it was recognized that creative teaching has different characteristics than teaching creativity. In 1999, the NACCCE report distinguished creative teaching as "using imaginative approaches to make learning more interesting and effective" (p. 89); on the other hand, teaching for creativity was defined as "forms of teaching that are intended to develop young people's own creative thinking or behavior" (p. 89). Craft

(2006) stated that creative teaching concentrates on teachers' practices in teaching, whereas teaching creatively highlights learner agency.

In the common association between creative teaching and teaching creativity, both concepts required an interactive relationship and full engagement between teachers and students. However, the biggest differences between creative teaching and teaching creativity are the learning strategies. In creative teaching, the focus is on "teacher orientation of the former" and teaching for creativity focuses on the "learner orientation" (Wilson, 2015). Overall, teachers in all fields may teach creativity and use creative teaching strategies in responding to students' needs, and sometimes they may do both simultaneously (Jeffrey & Craft, 2004). Thus, creative teaching may occur spontaneously or arise in contexts where teachers are teaching creativity.

Creative Teaching

Teaching is a manifestation of creativity (Burnard, 2006). One of the teachers' roles in the classroom is to catalyze the students' creative process. In creative teaching, teachers are involved in making learning more interesting and effective by using imaginative approaches (Wilson, 2015). The idea of creative teaching embraces two elements: obtaining new knowledge and transforming the previous knowledge into new contexts (Mayer, 1989). Creative teaching has different qualities that drive teachers to teach creativity, such as imaginative, dynamic, and innovative approaches (Jeffrey & Craft, 2004). Creative teaching does not mean introducing something new. On the contrary, it focuses on solidifying students' ideas, attitudes, beliefs, which have already formed to beneficial results (Jeffrey & Craft, 2004).

Scholars explained and identified creative teaching differently. Bramwell, Reilly, Lilly, Kronish, and Chennabathni (2011) stated that "good teaching is creative teaching" (p. 228). Rinkevich (2011) described creative teaching as customization of knowledge and learning content in a meaningful way. Creative teaching was also perceived as an instructional technique for transferring previous knowledge to new problems (Mayer, 1989). Craft (2006) stated creative teaching is on "exciting, innovative, engaging, and often memorable pedagogy" (p. 129). Overall, creative teaching could be explained as the actions, behaviors, and methods that teachers demonstrate in the classroom to deliver the learning context in a novel and useful way. These conscious actions teachers perform usually seek to challenge students to come up with creative ways of learning and creative solutions.

There are a variety of methods that teachers can use in creative teaching to inspire and encourage students' learning experience in a meaningful way. There are three important combined elements that contribute to creative teaching: presenting the learning context in a meaningful way, using an active learning process, and evaluating students' problem-solving skills and learning outcomes (Mayer, 1989). Lucas (2001) indicated creative teaching occurs through motivating students' creativity by encouraging enthusiasm, imagination, and other skills. Teachers' creative abilities and attitudes can be used in effective approaches to present class material and communicate learning content (Fryer, 1996). Tsai (2013) stated teachers who are willing to practice creative teaching should lead with three teaching models, which involve instructional tactics, creativity, and task commitment. According to Jeffrey (2006), the four main characteristics of creative teaching are:

1- Innovation, which leads to stimulating new ideas

2- Ownership, which is related to teachers' borrowed ideas and methods of teaching contexts

3- Control, which is related to teachers' autonomy and pace

4- Relevance, which is related to teachers' beliefs and teaching practices towards effective approaches and methods.

Jeffrey's framework proposed that creative teaching is based on these four aspects; however, teachers should be following how students are involved in each aspect and what kind of creative agency is released.

Creative teaching is an important aspect of learning and enhances students' development (Jeffrey & Craft, 2004; Beghetto & Kaufman, 2010; Sternberg, 2015). Creative teaching is also associated with instructional effectiveness teaching (Bramwell et al., 2011; Sawyer, 2011). Creative instruction is innovative and strategic, and it delivers learning content in an energetic and interesting way (Jeffrey, 2006; Sawyer, 2011). In higher education, teachers can decide to teach creatively and for creativity. Teachers can look for the appropriate methods that serve their teaching context and apply them in their classes. Both concepts of creative teaching and teaching creativity are essential for learners' development and creative classrooms. However, this study focuses on teaching creativity, which emphasizes teachers' creativity beliefs, and focuses on their constructive practices and behaviors.

Teaching Creativity

The topic of teaching creativity has been broadly discussed in the educational realm. According to Treffinger (1983), teaching creativity has been supported frequently

through different education movements since it has shown a positive impact on students' growth (Sharma & Sharma, 2018). Teaching creativity is explained as forms of teaching that are intended to develop individuals' creative thinking or behaviors (Jeffrey & Craft, 2004). Teaching creativity goes a step further when it comes to students learning because it focuses on developing students' learning abilities.

Different strategies for teaching creativity may be applied to different educational settings, such as studio or lecture classes, and involve creative skills through suitable practices and orientation (Kaufman & Beghetto, 2009; Hennessey & Amabile, 2010; Cropley, 2011; Bereczki & Karpati, 2018). In teaching creativity, the process involves teachers recognizing students' creative strengths and fostering their creativity (Tsai, 2013).

Scholars have pointed out there are multiple ways to teach creativity. In teaching creativity, usually, learners are involved in multiple learning processes that generate learning and knowledge. Teachers can use some strategies to promote creative thinking skills through instructional methods and practices (Guilford, 1950; Torrance, 1963). It has been stated both analytical approaches to problem-solving and discovery and inquiry-based learning could extend students' empirical learning (Fasco, 2001). These approaches support students' process of idea creation and hone their complementary skills involving fluency, flexibility, elaboration, and originality. The NACCCE (1999) declared that there are several characteristics for teaching creativity.

- Teaching creativity encourages students to believe in their creative identity.
- In teaching creativity, teachers can identify students' creative abilities.

- Fostering creativity can be developed through several methods such as encouraging curiosity, providing different learning opportunities, using creative thinking processes, applying brainstorming activities, and supporting innovative contributions.

Different studies have revealed students can gain many advantages when creativity is nurtured, including problem-solving, group engagement, improve reasoning and memory; all these activities enhance students' learning outcomes and development (Guilford, 1950; Torrance, 1963; Isaksen, & Treffinger, 2004; Moran, 2010; Karpova, Marcketti, & Barker, 2011). There is a strong relationship between teaching creativity and students' development. Research has indicated that teaching creativity promotes students' creativity and impacts their holistic developing abilities by stimulating their reasoning skills and improving their problem-solving techniques, memory, and engagement within groups (Torrance, 1963; Guilford, 1967; Isaksen and Treffinger, 2004; Karpova et al., 2011). Scholars stress instructors should teach creativity more in their teaching (Fryer, 1996; Aljughaiman & Mowrereynolds, 2005; Cropley, 2016; Sharma & Sharma, 2018; Soh, 2018). Fryer (1996) pointed out teaching creativity focuses on building a contextual learning environment that increases students' problem-solving abilities and values their creative contributions, while both practices reinforce an ethos for fostering creativity (Jeffrey & Craft, 2004).

Teaching creativity doesn't require teachers to be creative. It seeks to develop students' creativity and to make them more creative, by boosting individuals' creativity through approachable tasks. According to Mullet et al. (2016), two factors make creativity more emphasized and valued in schools: it grows students' self-fulfillment and equips them for success in the "knowledge-based economy" (p.1). In the design domain,

teachers can facilitate creativity by encouraging students' motivation, inspiration, gestation, and collaboration (Fisher & Williams, 2004). Teachers can encourage creativity by building a respecting and trusting open environment that protects students from ridicule (Cremin, 2017). Giving students space and sustained time for thinking and producing work helps foster their creative endeavors (Oliver, 2002). Having an open attitude and questioning were also found as methods for enhancing creativity (Peters, 2014). Additionally, problem-finding/solving was a central aspect of teaching for creativity (Jackson & Shaw, 2006). The goal of teaching creativity is to develop students' orientations and skills by using several methods to come up with new ways of thinking.

Teaching creativity is extensive and rich. Worldwide scholars have advocated the need for direct teaching for creativity (Sharma & Sharma, 2018). The literature reveals a tie between creativity and education that asserts the value of creativity-fostering behaviors by educators (Esquivel, 1995; Walker, 1969; Soh, 2000; Tan & Majid, 2011; Sharma & Sharma, 2018). However, still there is a lack of knowledge about teachers fostering creative behaviors. Researchers indicated that teaching creativity and instructors' practices have not been given serious consideration (Soh, 2000; Aljughaiman & Mowrereynolds, 2005; Cropley, 2016).

Despite the many benefits of teaching creativity, students are still struggling to develop creativity (Bereczki & Karpati, 2018). Creativity is an attitude that may be adopted by any teacher in any field of teaching. Many domains require creative skills for students' academic growth. Within the study of creativity, looking at how teachers teach creativity allows us to better understand and identify the myriad ways that teachers engage in the classroom to influence students' learning.

Overview of Creativity in Design Context

Design is a broad discipline of creativity and innovation; in essence, design seeks to create something inventive and unique. However, there is still a lack of research on creativity in the design field (Demirkan, 2010), specifically on teachers' creativity practices in the classroom. The published research on teaching creativity in design explores a variety of topics.

For example, scholars acknowledge that creativity might be a complicated process that integrates and relates within four aspects: creative persons, the cognitive process, products of creative performance, and social environment (Rhodes, 1987; Batey & Furnham, 2006; Zimmerman, 2009). This process might be acquired by individuals or groups, and produce original or appropriate results that are influenced by personal or environmental aspects (Amabile, 1996; Csikszentmihalyi, 1996; Sternberg & Lubart, 1991; Plucker et al., 2004). Several studies have investigated these four components, either independently or collectively, to understand the association between them.

In regards to the four aspects of creativity and the design process, Hasirci and Demirkan, (2007) studied the interaction between person, process, and product inside a creative environment in architecture. The results indicated the three elements of creativity (person, process, and product) were significantly different from each other. Later, these three elements were examined intensely again by Hasirci and Demirkan (2007). The researchers studied the cognitive stages of the creative decision-making process in a design studio. To encourage students' creativity, teachers enhanced the mental imagery and external representation in the design process. The methodology was based on classroom observations of students' design process, and rating assessment developed by

the researcher. The results revealed a high correlation between process and students' overall creativity. This suggests teachers can impact students' abilities if they use the appropriate creativity methods in the appropriate stage of learning.

One of the topics currently discussed in design education is the significant role of creativity training. Design education is a field that is considered a perfect environment for fostering students' creativity (Lau, Ng, & Lee, 2009). However, teachers are the ones who are responsible for guiding students in the design process. Lau, Ng, & Lee (2009) developed a models to guide teachers to facilitate students' creative thinking process. The results revealed a model exercises students' creative design abilities by introducing certain phases of design thinking such as problem identification, process formulation, and producing innovative ideas and solutions based on acquired knowledge and context. This indicates creative thinking is an intellectual process; therefore, the arrangement of creative learning activities within design education is crucial in helping students to release their creative potential.

Some researchers look at design instructors as facilitators for encouraging students' learning, especially in the design studio (Budge, 2016). It was found that teachers look at design classrooms as a community of practice for technical skills, and design teachers are more likely to model how to perform the role of a professional creative. The results revealed teachers in some design fields coach students to be artists/designers. They train students in various ways on how to communicate about their work, develop disciplinary language, respond to feedback, and alter their practice. This suggests some teachers focus only on the technical aspects and ignore other intended

learning outcomes such as creative thinking process and ideation, which is the first step of any project in design.

Another topic has been discussed is how teachers' can support students' creativity in the classroom by applying a collaborative digital environment in the design process. Karakaya and Demirkan (2015) studied the interaction of creativity and collaboration in a digital environment in the design process. The study framework was based on Amabile's componential theory of creativity, which is composed of three intra-individual components of creativity and the social environment. A high correlation was found between the amount of process knowledge and the creativity of design products. This indicates using digital applications in the design process could be one way to encourage students' creativity.

Previous research also analyzed creativity factors and assessed creativity in design education studios. Assessments have been created to explore creativity for interior design students. The objective of Demirkan and Afacan's (2012) study was to develop an instrument for assessing student's creative work. The results revealed student's results can be evaluated by assessing the characteristics of design creativity.

David Cropley and Arthur Cropley have multiple explorations and publications on creativity and innovation in engineering and education. One of the vital studies in creativity is David Cropley and Arthur Cropley's (2000) investigation of the importance of creativity in Technological Design Education. An experimental study was conducted in two groups. The participants in both groups were tested with two assessments; one was the Test for Creative Thinking–Drawing Production (TCT—DP) and the second was an engineering behavioral measure that shows scores in relation to the real-life work of

building “a wheeled vehicle powered by a mousetrap” (p. 300). Students for both groups participated in the TCT—DP early in the semester and then retested after six weeks. The aim of the first phase of the test was to collect data for comparing group scores. The experimental group was involved in lectures on creativity and counseling sessions. However, the control group didn’t participate in any creative activity during the six weeks. The outcomes showed significant differences between the control group and the experimental group. The experimental group displayed higher scores in both tests; also, they became more innovative and creative. In addition, the experimental group behaviors were different in the other classroom activities related to their specialized training. This result indicates using different educational practices impacts instructional processes and outcomes.

In the literature of creativity in education, several evaluations and methods are discussed, and instruments are advised for measuring fostering creativity (Demirbas & Demirkan, 2003).

However, the existence of several creative nurturing assessments didn’t solve the problem of limited research in creativity in the design domain. Christiaans and Venselaar (2005) stated that some difficulties limit the study of creativity in the design field, including the inferiority of the protocols for analyzing the cognitive processes of designers. Another challenge is the lack of specific measurements and techniques for evaluating different kinds of creativity of designers. According to scholars, these difficulties are connected to the nature of the design process (Demirkan, 2010).

The progress of creativity implementation in design education may have decelerated because of teachers’ personal beliefs about creativity and its nurture

(Beghetto & Kaufman, 2010; Bereczki & Karpati, 2018). For this reason, it is fundamental to understand a few of the aspects that are related to the creative design process, teachers' beliefs about how creativity influences students' design production, and the design process and practices that teachers use in the classroom to direct students (Bereczki & Karpati, 2018).

This study will focus on explaining how design instructors enhance students' creativity in the design process. Besides, the study will examine teachers' creativity beliefs, characteristics, and classroom practices that impact their creative instructional process, which will be discussed in the next section.

Teacher's Perceptions (Beliefs), Characteristics and Behaviors Regarding Creativity

Teachers' beliefs about creativity and implementation of creativity in education are discussed in the literature. Many investigations examined teachers' beliefs about creativity were based on K-12 settings and few on higher education. There were 53 studies published between 2010 and 2015 that discussed teachers' beliefs (Andiliou & Murphy, 2010; Bereczki & Karpati, 2018). However, most of these studies were based on K-12 settings and only a few on higher education, which indicates the gap in the literature regarding creativity in higher education. The literature on the teacher's role in creative teaching can be divided into three categories: teachers' creativity beliefs or perceptions, teachers' creativity characteristics, and teachers' creativity behaviors. The literature review revealed there is a relationship between teachers' perceptions and teachers' individual characteristics (Mullet, et al., 2016). Research shows teachers' creativity practices and values are influenced by their beliefs about creativity or creativity self-

efficacy. This indicates these three categories are related to each other, and they are inseparable.

Teachers' beliefs and perceptions about creativity are discussed heavily in creativity research, more than teachers' creativity practices, and teachers' creativity attitude or characteristics. This section discusses the literature on teachers' epistemological beliefs and characteristics to determine whether these traits have any associations to their instructional classroom practices for enhancing and developing students' creative thinking.

1. Teacher's Perceptions (Beliefs)

The literature uses various terms to describe teachers' beliefs, such as perceptions, conceptions, views, values, attitudes, perspectives, and implicit aspects (Andiliou & Murphy, 2010; Bereczki & Karpati, 2018). Teachers' beliefs form in different ways. Some beliefs can be changed or become resistant; others exist in a complex way and stay central; all these beliefs impact teachers' teaching practices (Bereczki & Karpati, 2018). Fives and Buehl (2012) identified teachers' beliefs as ones that include the self, context, environment, content, knowledge, teaching practices, and students. In this study, the term "teachers' creativity beliefs" will indicate how creativity is nurtured in the classroom.

Bereczki and Karpati (2018) found 53 studies on teachers' beliefs about creativity. Their systematic literature review revealed three main areas that researchers have examined regarding teachers' creativity and related beliefs: (a) teachers' beliefs about the nature of creativity, (b) the characteristics of creative people, (c) and the environment of fostering creativity in the classroom. Most of these studies examined teachers' beliefs in elementary, secondary, and K-12 teachers (Andiliou & Murphy,

2010), which indicates a gap in the literature about exploring teachers' creativity beliefs in higher education and particularly in the design domain. The following section presents precedent studies that focused on teachers' creativity beliefs about the nature of creativity and creativity-fostering classroom environment.

An early study conducted on teachers' perceptions of creativity was by Fryer and Collings (1991). They examined teachers' perceptions and attitudes toward creativity amongst elementary teachers at 57 schools in Britain. The study involved three phases. First, all teachers completed a set of questionnaires that included the Torrance Ideal Pupil Checklist (Torrance, 1965) and the Torrance Personality Checklist (Torrance, 1975), as well as questions related to perceptions, attitudes, socio-demographics, job-related factors, and a variety of other topics. Second, semi-structured interviews were carried out. Third, surveys were sent to the head of each school, asking about the social and structural information of the school. The results showed that British teachers believed creativity involves imagination and original ideas, and it is a rare gift. Moreover, they believed creativity could be developed, but it is only relevant to specific fields. Fryer and Collings (1991) stressed that further explorations are needed for teachers' views of creativity and the factors associated with these perceptions. This study was thorough, with extensive quantitative and qualitative data. However, the researchers did not disclose most of the details such as the study questionnaires.

Teachers' beliefs about the nature of creativity often varied. Diakidoy and Phtiaka (2002) investigated the creativity beliefs of elementary teachers in Cyprus using a descriptive questionnaire checklist. The results showed 83% of Cypriot teachers agreed with the teachers in Fryer and Colling's (1991) study that creativity could be facilitated in

everyone. Besides, teachers defined creativity in this study as a conceived ability, characteristic, or cognitive process that leads to novel outcomes. This suggests teachers' creativity beliefs are conceptualized differently; some teachers see creativity only through the person, process, and product.

Aljughaiman & Mowrereynolds (2005) studied the conceptions, attitudes, beliefs, and classroom practices of teachers in four elementary and two secondary schools. Teachers responded to seven close-ended questions that investigated their beliefs, attitudes, and opinions toward facilitating creativity in the classroom. Teachers also responded to seven open-ended questions about what creativity means, features of creativity, characteristics of the creative student, activities that support creativity in the classroom, essential elements of creativity, and lastly, if creativity should be taught in the class and why. The results from this study confirmed the findings of previous studies (Marliyn Fryer & Collings, 1991; Isaksen, & Treffinger, 2004; Sternberg, 2006) regarding the elements of creativity. The results also revealed 60% of the teachers believed that more than 50% of their students exhibited creative characteristics. This is contrary to Fryer and Collings' (1991) study results that report creative characteristics were rare amongst their students. Researchers also found that teachers were confused about the difference between intelligence and creativity. Furthermore, they asserted that most teachers showed positive opinions toward teaching creativity in the classroom. However, they felt they were not responsible for developing their students' creativity. For this reason, the researchers suggested further study to understand this problem.
These results indicate teachers lack clarity about the concept of creativity and its value, which could affect their creative practices and behaviors in the classroom.

In another study, Kampylis, Berki, and Saariluoma (2009) also examined primary teachers' conceptions of creativity and their confidence to develop students' creativity. The study involved 132 Greek in-service and prospective teachers. The data collection instrument was a self-report questionnaire of 41 items. The researchers concluded most of the teachers agreed that students have creative potential, that creativity can be trained, and that the teacher's role is to facilitate. Furthermore, teachers believed creativity is a vital factor for personal and social development. Teachers stated schools occasionally don't offer opportunities for developing students' creativity, and because of that, teachers do not feel confident or well-trained to achieve this goal. Both studies of Aljughaiman and Mowrereynolds (2005) and Kampylis et al. (2009) focused only on teachers in the art domain. This may lead to art being viewed as the only domain where teachers' beliefs about creativity are relevant. This could be a widespread belief held by other teachers in other fields.

Investigators who examined beliefs about the classroom environment also explored teachers' attitudes and teaching strategies that foster creative thinking in the classroom. Fleith (2000) studied teachers' and students' perceptions of the characteristics that stimulate or inhibit creativity development in the classroom environment. Interviews were conducted with seven elementary teachers and 31 students. Both teachers and students believed that an environment that stimulates creativity offers "time for creative thinking, rewarding creative ideas and products; encouraging sensible risks, allowing mistakes, imagining other viewpoints; exploring the environment, questioning assumptions; finding interests and problems; generating multiple hypotheses; focusing on broad ideas rather than specific tasks and thinking about the thinking process" (p. 148).

This suggests teachers have a broad view of creativity; they look at it through building a supportive classroom environment.

Several variations about teachers' perceptions of learning activities that foster creativity in the learning environment were examined by Tan (2001). Questionnaires were disrupted and completed by experienced teachers and student teachers. Both groups of teachers realized that an open and flexible environment is necessary for nurturing creativity, and the experienced teachers emphasized that learning activities encourage creative thinking.

Another study investigated classroom environmental factors was by Cheung, Tse, and Tsang (2003). The study focused on comparing the views of Chinese language teachers about creativity and their teaching practices in writing. Teachers completed a questionnaire emphasizing teachers' beliefs about creativity, their perceptions of developing their students' creativity, and teaching practices related to creative writing. Teachers were not able to differentiate between classroom practices that enhance creativity, or exciting games and artistic teaching activities. Moreover, they identified the classroom environment and teachers' attributes as the main environmental factors of student learning and creativity.

Creativity beliefs might be influenced by several aspects of the educational system, such as curriculum, values, and objectives formed by the social environment and cultural context.

One study found that Korean teachers' perceptions of creativity and teaching practices changed after participating in a professional development program abroad (Park, Lee, Oliver, & Cramond, 2006). The secondary science teachers had to complete open-ended

questionnaires and interviews. The outcomes revealed most teachers believed creativity was a significant aspect of school and society. Furthermore, teachers exhibited an awareness of creativity after training, which suggests that cultural aspects could limit creativity in teaching and curriculum sometimes.

This outcome discloses that some teachers are open to the idea of implementing creative potential in their courses, whenever they are provided with the appropriate training and teaching methods.

Research indicates there is a gap between teachers' creativity beliefs, attitudes, and values (Myhill & Wilson, 2013). The observations and interviews of Myhill and Wilson's study revealed that teachers' conceptualization of creativity is limited to creative products. Teachers in this study believed creative strategies could be trained, but creativity could not.

It is important to bear in mind that teachers' beliefs are not the only factor that impacts teachers' creativity practices in the classroom. Scholars have claimed that examining more aspects, such as teachers' behaviors, attitudes, or characteristics, can explain teachers' decisions and processes in detail, specifically the ones that lead to creative instruction in the classroom (Beghetto & Kaufman, 2006).

2. Teachers' Personality and Characteristics

Few studies have investigated the relationship between teachers' perceptions and teachers' personal characteristics (Mullet et al., 2016). Studies indicate teachers' creative personality could impact teachers' creativity practices and the role of enhancing students' creativity (Farella, 2010; Lee & Kemple, 2014; Chan & Yuen, 2015; Mullet et al., 2016).

Esquivel (1995) declared teachers who have a humanistic philosophical orientation, great interpersonal relationship skills, and creative personality characteristics tend to reinforce their students' creative development.

Individual creativity is a combination of specific patterns and qualities (Eysenck, 1983). These special qualities include: breaking boundaries, building complex cognitive structures, generating ideas quickly, and expressing oneself confidently (Cropley, 1992). According to Albert and Runco (1999), there is a significant correlation between creative individuals and independence. Creative individuals are known for autonomy, nonconformity, lower self-control, and less willingness to conform or make a big impression.

Several characteristics identify creative teachers such as curiosity, risk-taking, independence, open-mindedness, humor, self-confidence, flexibility, and aesthetic orientation (Horng, Hong, ChanLin, Chang, & Chu, 2005; Burnard, 2006). These characteristics or traits are associated with thinking styles, which involve "visualization, imagination, experimentation, metaphorical thinking, reflection, analysis, synthesis, and evaluation" (Burnard, 2012, p. 168).

Some researchers have described a teacher's creative personality as characteristics that can be professionally developed and oriented towards education (Hong, Hartzell, & Greene, 2009; Farella, 2010; Bramwell et al., 2011). Researchers have suggested that creative teachers especially must be approachable, friendly, knowledgeable, interesting, caring, insightful, and imaginative (Hamza & Griffith, 2006). Creative teachers must also be able to address conflicts and classroom disruptions as well as create innovative teaching ideas, strategies, and activities.

One of the significant characteristics that have been associated and measured in many studies about creativity traits and personality is openness to experience (Hirsh & Peterson, 2008; Prabhu, Sutton, & Sauser, 2008; Hoseinifar et al., 2011). In higher education, openness to experience has been perceived as a sign of a creative personality, especially in creative drawing tasks and creative behavior assessments (Dollinger, Burke, & Gump, 2007). Individuals who are open to experiences exhibit higher divergent thinking skills, creative achievement, and creative abilities (Silvia, Nusbaum, Berg, Martin, & Connor, 2009).

Teachers' characteristics may either stimulate or inhibit creativity development in the classroom (Fleith, 2000). The findings of Fleith's study suggested teachers' behaviors that enhance creativity involve setting few rules for class projects, providing teaching choices, accepting students' ideas, and boosting their self-confidence by focusing on students' strengths or interests. On the other hand, characteristics that inhibit creativity are related to teachers' rejection of students' ideas and teachers controlling the class structure.

Individual traits influence teaching practices and classroom activities through:

1) Teacher personality: attributes include persistence, willingness to develop, openness to new experiences, self-confidence, sense of humor, curiosity, depth of ideas, imagination, etc.

2) Family and backgrounds factors: include being open, and to teach by using different ways.

3) Experiences of growth and education: by using games, stories, and brainstorming.

4) Beliefs in teaching: which include hard-working and motivation.

5) School organization (Horng et al., 2005).

In higher education, there is a relationship between teachers' personality traits and instructors' beliefs about teaching creativity activities (Alencar & Maria Freire de Oliveira, 2016). Researchers acknowledged that additional investigation is needed on instructors' views of creativity in higher education and its significant characteristics. In this study, twenty instructors from Brazil were interviewed. Results indicated all instructors agreed on the importance of creativity in sciences and humanities. Instructors found fostering creativity in higher education is crucial because it is a part of knowledge, production, innovation, society's demands, and students' motivation. Also, instructors indicated using multiple activities to foster creativity eliminates barriers and enhances creative motivation between instructors and students.

Many teachers declare they favor creativity and the rewards of creative exploration; however, they may resist the creative potential of students' behaviors or efforts (Westby & Dawson, 1995; Fleith, 2000; Runco & Johnson, 2002). Teachers who value creativity and cultivate it can see a beneficial impact on their students in different ways. Nurturing creativity motivates students to participate in class activities, benefits divergent thinking and problem-solving, facilitates creative notions, and allows students to communicate their ideas (Beghetto & Kaufman, 2010; Hondzel & Cathrine, 2013).

Teachers' behaviors and human creativity behaviors are an individual's actions based on what beliefs they adopt and believe to be true, regardless of whether they can support that representation with evidence or not (Bereczki & Karpati, 2018). Bandura (1997) claimed individuals' beliefs are what guide personal goals, reactions, emotions, actions, and decisions, not necessarily known truths. Prior investigations indicated

teachers' creative behaviors and perceptions of creativity are often divided into two aspects (Bereczki & Karpati, 2018), which can be implicit or explicit (Kagan, 1992; Kaufman et al., 2006).

There are several implicit and explicit aspects that impact teachers' creativity fostering behaviors, which include abilities, gender, age, experiences, and personalities (Bamburg, 1994; Runco & Johnson, 2002; Aljughaiman & Mowrereynolds, 2005; Saracho, 2011). The implicit perceptions of teachers are related to their consciousness. Teachers form the subconscious thoughts by analyzing students' behaviors, attributes, and creative potential (Runco & Johnson, 2002; Saracho, 2011).

The explicit theories of teachers' creativity depend on how they define creativity and their deliberate behaviors. These efforts include project types, classroom organization, environment, creative exploration, and decision-making (Hondzel, 2013). The implicit and explicit aspects of creativity both contribute to student learning and inform the way teachers perform and behave towards fostering creativity. This study will examine what kind of perceptions and creativity practices the most creative instructors at the College of Design perform in their teaching.

There are a variety of teaching behaviors and practices that have been identified for stimulating or supporting students' creativity. Teachers who desire to nurture their students' creative skills can encourage it through classroom activities and practices. Students' creativity can be facilitated by giving students opportunities to communicate their ideas, responding to their unusual questions, and by highlighting the value of their ideas for solving problems (Beghetto & Kaufman, 2010). Teachers also can encourage creativity by promoting risk-taking, self-discipline, group trust, and ambiguity tolerance

to foster creativity (Piirto, 2010). These behaviors provide a space for creative thinking, skill-building, inspiration, ideation, and intuition.

Cropley (1992) investigated teachers' creativity fostering behaviors. The outcomes revealed teachers can encourage students' creativity by offering chances for self-directed learning, divergent thinking skills, and giving students opportunities to explore problems, materials, and ideas. Moreover, Cropley asserted teachers who understand divergent thinking clearly and relate creative behaviors in their teaching objectives with their students are likely to achieve this goal even if they do not give it special attention in every class.

Later, Cropley (1997) identified nine specific teacher behaviors that enhance student learning, using the social facilitation model that was developed by Zajonc (1965). These behaviors support classroom practices and contribute to students' creativity. The nine behaviors Cropley identified offer a comprehensive foundation in theory and provide a model that can be quantified for measuring teachers' explicit behaviors in the classroom (1997). Cropley's literature has been selected as a guide for investigations on teachers' creative behaviors (Soh, 2000). It is indicated that teachers can impact students' learning by modeling and leading learners by using proper behaviors (Cropley, 1992). These nine creativity-fostering behaviors are parallel to some researchers' works and recommendations that focused on fostering creativity (Beghetto & Kaufman, 2010; Piirto, 2010; Runco, 2014).

Each of the nine creativity fostering behaviors or conditions Cropley identified was given a single word label and was operationalized in terms of teachers' creativity classroom practices to develop the CFTIndex. For students to encourage their creative

ideas, classrooms need these conditions and teachers need to create these conditions. The nine characteristics are briefly summarized below, as discussed in both Soh and Cropley.

1- Independence

The most significant teacher behavior that fosters students' creativity is by encouraging students to learn independently. Creativity is identified to be unique and requires a certain degree of independence. In the classroom, teachers may encourage student independence in thoughts and actions.

2- Integration

Having a co-operative and socially integrative style of teaching allows students freedom to be expressed in a social context. The teachers' role is to guide more than to dictate.

This encourages students' cooperation with each other and in their work environment. It is important that students learn to work with others even in a creative atmosphere.

3- Motivation

Motivating students to master factual knowledge allows students to have a solid base for divergent thinking. It is a misconception that to be creative ideas should come from nothing. Creativity arises from adding critical elements that were not there before.

4- Judgment

Delaying judging students' ideas until they have been thoroughly worked out and clearly formulated encourages students' self-evaluation, their thoughts, and actions. Holding judgments provides opportunities for students to reflect and become more independent from the teachers' authority. This is necessary for students' development of self-imposed standards and autonomy, which is needed for creativity to appear.

5- Flexibility

Encouraging flexible thinking is needed for encouraging divergent thinking. Enhancing flexible thinking opens possibilities for students, which leads to the basic requirements of creativity. When students have acquired essential knowledge, they need to be able to think divergently and with diverse perspectives.

6- Evaluation

Promoting self-evaluation in students is a counterpoint to judgment. When students rely on teacher judgments, their thoughts and actions become dependent on teachers. Self-evaluation allows students to practice their own judgments by applying their self-set standards and learning to evaluate their own creativity.

7- Question

When teachers take students' suggestions and questions seriously, they show respect for students' efforts to be creative. Ignoring students' suggestions and questions is detrimental, because it sends a negative message to students and shows their thinking or searching is not worthy. Teachers can stimulate students' answers by encouraging independence, promoting integration, motivating thoroughness, accepting flexibility, and valuing self-evaluation.

8- Opportunities

Providing students with opportunities to work with a wide variety of materials and under different conditions offers a variety of creative outlets. Creativity can be fostered through exposing students to many different situations.

9- Frustration

By helping students learn by cope with frustration and failure, they develop the courage to try new and unusual ways of solving problems. The process of developing ideas and execution might not be smooth for all students. Students need supporting, listening, and understanding to face all the obstacles to continue developing their work.

In a study investigating mathematics teachers, researchers found even teachers share a similar conception of creativity, their actions, teaching behaviors, and classroom practices are significantly varied (Leikin, Subotnik, Pantazi, Singer, & Pelczer, 2013). The findings reinforced the belief that fostering students' creativity requires creative characteristics in teaching. Across the sample teachers' shared some creative characteristics such as enjoyment of the subject that they teach, using instructional skills in an optimal manner, and valuing and eliciting student creativity. Leikin et al. (2013) stated to enhance students' creativity, teachers must design original instructional activities and use real-life situations for problem-solving.

Teacher's behaviors that foster creative skills focus on encouraging students' participation in classroom exercises, offering opportunities for students to generate and express their ideas, and rewarding their divergent thinking results (Sharma & Sharma, 2018). Teachers must support students' rare questions, show interest in their work, and admire them. Teachers must encourage students' actions in the classroom, including "risk-taking, self-discipline, group trust, and tolerance for ambiguity, and allow them to foster self-directed learning and divergent thinking skills" (Sharma and Sharma, 2018, p. 118).

Therefore, fostering creativity is one of the significant actions instructors may accomplish through practices. There is plenty of convergence on what behaviors enhance creativity. In the classroom, instructors have an essential role in the process of student learning and development. Teachers' could have an impact on their students' ideas, knowledge development, and thinking skills. Teachers' positive behaviors and practices motivate students and increase their efforts; on the other hand, their negative behaviors and engagements inhibit students' creative exploration and learning results. For this reason, it is important to investigate the creative behaviors and practices that teachers demonstrate in their teaching with appropriate measurements.

Instrumentation for Measuring Instructors' Creativity Fostering Behaviors in the Classroom

Many researchers have investigated teachers' creativity nurturing behaviors (Bamburg, 1994; Runco & Johnson, 2002; Soh, 2000; Aljughaiman & Mowrereynolds, 2005; Saracho, 2011; Sharma & Sharma, 2018). Duncan (1987), Houston (1990), and McKinnon, (1978) claimed that effective teachers demonstrate creativity fostering behaviors in the classroom. Various scholars have identified the qualities of effective teachers, including a sense of humor, enthusiasm, spontaneity, empathy, dedication to students, flexibility, openness, creativity, imagination, and willingness to share a personal side (McGreevy, 1990; Sharma & Sharma, 2018; Torrance & Myers, 1970; Whitlock & DuCette, 1989).

Guilford (1950) was the first to suggest that creativity could be determined and measured. He stated that creativity was innate in different domains; however, creativity showed more in the fields of science and technology. In Guilford's speech to the

American Psychological Association, he emphasized two problems for educators which are related to this study. The first one is how to *search* for creativity in children, and the second one is *how to promote creative personalities*. Guilford proposed creativity can be developed in the classroom by teaching students how to synthesize, analyze, reorganize, redefine new ideas, and evaluate (1950).

Since Guilford, many instruments have been developed for measuring creativity behaviors. However, there is a *dearth of suitable evaluations* for measuring teachers' creativity fostering behaviors (Dikici, 2014; Soh, 2015). It should also be noted that most research related to creativity investigations and instruments has looked at elementary and secondary school teachers. Only recently has this research expanded to higher education.

This section presents relevant instruments found in the literature examining creativity behaviors. These instruments were selected because they have been used in education and have explored different teacher's qualities. They were also chosen because they have strong credibility and validity, according to their researchers. Some of these instruments are based on theoretical models, personality trials, previous investigations, teachers' experiences, and creativity researchers' perspectives. According to the Creativity Based Information Resources (CBIR) database, there were 162 assessments of creativity published from 1994 to 2004, and among these instruments, only five sources were tested on teachers. 1- The Creative Behavior Inventory (CBI) has been used in several studies to evaluate student's creative behaviors and teacher's creative activity. 2- The Ten-Item Personality Inventory (TIPI) was based on Goldberg's (1999) Model of the Big Five personality theory. 3- The Instructional Practices Questionnaire (IPQ) determines teachers' instructional practices in relation to cognitive, interpersonal, and

intrapersonal factors. 4- The Teacher's Creativity Nurturing Behavior (TCNB) Measurement, and 5- The Creativity Fostering Teacher Behaviors Index (CFTIndex) both assess teachers' creativity fostering behaviors, but the development concept and the index structures are dissimilar.

The following section is a bibliography that provides a bird's-eye view of the five mentioned instruments. The brief summaries cite examples of different studies using these instruments, which were conducted to investigate teacher's behaviors, or education, and other areas of research. The first three instruments were applied in education and other fields, as shown in Table 1. The other two instruments were used to investigate teachers' behaviors, which focus on students' creativity fostering,

C.I The Creative Behavior Inventory (CBI)

The Creative Behavior Inventory (CBI) was created by Hocevar (1979). Many scholars used this inventory and developed it to suit their investigations (Plucker, Qian, & Wang, 2011; Youngstrom & Murray, 2013; Dikici, 2014; Puryear, 2015; Soh, 2015; Zhu et al., 2016). The inventory assesses the frequency of creative activity in participants' 'adolescent and adult life' through a self-reported checklist. The questions concentrate on previous activities and achievements, including painting, poems, or receiving a prize for art-making or craft.

This inventory has been used on school teachers in mathematics, science, music, fine arts, and arts (Hocevar, 1979). The inventory has been subsequently developed and expanded for new investigations on students in higher education, culture influences, and factors that impact everyday creative activities and creative achievement (Hocevar, 1979;

Plucker et al., 2011; Youngstrom & Murray, 2013; Emanuel Jauk, Benedek, & Neubauer, 2014; Milojevic & Jin, 2019).

In the area of education and investigating teachers' creativity behaviors, Lee and Kemple's (2014) quantitative study used the CBI inventory to examine the relationship between teachers' engagement and their teaching practices that foster creativity. Moreover, they examined teachers' beliefs and personality traits. In a related study, Cadima et al (2010) explored the associations between the quality of teachers and student interactions adaptive behavior for first-grade students.

Ringler, Oneal, Rawls, and Cumiskey's (2013) study used CBI to develop a framework to examine 15 principles at local high schools. The goal was to improve student academic literacy by changing the role of the school principal from 'booking agent' to 'CEO-Chief Educational Officer', by facilitating their professional development. The researchers evaluated the influences of the new framework on the university principals' ability to provide support to teachers through several measurements. They assessed the impact on teacher practices using The Sheltered Instruction Observation Protocol (SIOP), and the changes in influence on student learning results by using the CBI.

C.2 The Ten-Item Personality Inventory (TIPI)

The Ten-Item Personality Inventory (TIPI) by Gosling, Rentfrow, and Swann (2003) was created to assess teachers' personalities. It was based on Goldberg's (1999) Model of the Big Five of personality theory, which is: emotional stability, extraversion, openness to experience, agreeableness, and conscientiousness. The TIPI contains ten items, and each domain of the five dimensions consists of two items.

Each statement is rated on a 7-point scale, from 1 (disagree strongly) to 7 (agree strongly). The results of the original research of Gosling et al. (2003) on TIPI showed sufficient validity and reliability of this inventory.

The TIPI inventory has been used in many studies by (Runco & Johnson, 2002; Langford, 2003; Woods & Hampson, 2005; Donnellan, Oswald, Baird, & Lucas, 2006; Muck, Hell, & Gosling, 2007; Rammstedt & John, 2007; Ehrhart, Roesch, Ehrhart, & Kilian, 2008; Ehrhart et al., 2009; Sibley, Osborne, & Duckitt, 2012; Rang Lee & Kemple, 2014; Ispir, Elibol, & Sonmez, 2019; Krieger, Becker, Greiff, & Spinath, 2019) and has been modified for specific research situations. For example, in Ehrhart et al. (2009), the goal of the study was to develop a short test of the Five-Ten-Item Personality Inventory (TIPI) for use when the researcher doesn't have time or space for investigations.

One example of cultural investigation that applied the TIPI is the Besser and Shackelford (2007) study, which looked at the association between vacationers' personality and positive impact on negative mood. Chamorro-Premuzic, Bennett, and Furnham (2007) examined the relationship between three aspects--(1) the Big Five personality traits (Gosling et al., 2003),
(2) emotional trait intelligence (EI) by (Petrides & Furnham, 2001), and (3) happiness (Argyle, Martin, & Crossland, 1989) amongst university student and non-student participants.

In higher education and teacher evaluations, Lee and Kemple (2014) examined the relationships between teachers' personality traits and their engagement in creative activities. Teachers were asked to indicate and rate themselves based on the description

listed to their behavior and personality. Each statement starts with "I see myself as," for example, open to new experiences, complex, conventional, uncreative (Reverse), dependable, self-disciplined, …etc.

C.3 The Instructional Practices Questionnaire I (IPQ-I)

The Instructional Practices Questionnaire I (IPQ-I) was developed by Hong, Hartzell, & Nadelson (2005, 2006). The IPQ-I focuses on measuring teachers' instructional practices that facilitate and promote students' creative thinking. The questionnaires have 30 items, measuring five constructs and six items per section (Hong et al., 2009). Each question starts with a general stem, for example: *Students in my class are given opportunities to* follow an item such as *solve problems that have more than one answer, demonstrate brainstorming skills,* or *work in groups*. The teachers' response to each question must be rated based on their classroom practices from
1 to 4, (1) Not at all true, (2) Seldom true, (3) Somewhat true, and (4) Very true.

Hong, Greene, and Higgins (2006) investigated the IPQ-I first version on instructional practices of general education classroom teachers and talented education teachers. The concentration was on three domains of teacher's instructional practices: cognitive, interpersonal, and intrapersonal. The IPQ is a useful measurement for researchers who are interested in understanding teachers' instructional practices and in improving classroom instruction. In this study, the researchers used the IPQ-I in the pilot study, and based on the feedback, the IPQ-II second version was developed and tested. The researchers used IPQ-II to evaluate both teachers' group orientation plans as they appeared and were perceived in their teaching process, structure, and instructional materials. The IPQ-II questionnaire used only 24 items, measuring two subscale

constructs and 12 items each on learning and performance goals, but the measuring scale for this inventory is similar to the original IPQ-I. According to Hong, Greene, & Higgins (2006), this study shows strong verification evidence of the IPQ-II, for both reliability and validity of scores.

Hong, Hartzell, and Greene's (2009) study focused on exploring teachers' instructional practices that facilitate students' creative thinking by using the IPQ-I first version. Researchers examined elementary teachers' practices that foster students' creativity in three areas: epistemological beliefs, motivation, and goal orientation. Teachers were asked to evaluate their teaching and measure their instructional practices that assist their students' creative thinking development. The IPQ has 30 items measuring 5 constructs (6 items per construct). The questionnaire began with a general stem (In my class…) followed by items, '*I select challenging instructional materials for my classes*. Teachers had to respond to each item by rating their perception of students' interaction to receive these instructions on a 4-point scale: (1) Almost never, (2) Sometimes, (3) Often, and (4) Almost always. The results indicated there is a relationship between student learning and teachers' epistemological beliefs, intrinsic motivation, and goal orientation in their teaching practice. Moreover, the researchers found teachers who had sophisticated beliefs about educational practices that nurture creative thinking and had a high level of motivation reported practicing creativity instruction in their classroom.

The following Table compares the three instruments discussed in the above section.

Inventory	Developer	Measuring	Studies	Based on	Area of investigation
The Creative Behavior Inventory (CBI)	Hocevar (1979)	Evaluating teacher's previous creative activities experiences	(Hocevar, 1979; Emanuel Jauk, Benedek, & Neubauer, 2014; Nassif & Quevillon, 2008 ; Jauk ,2014; Plucker, Qian, & Wang, 2011; Puryear, 2015; Youngstrom & Murray 2013, Zhu et al., 2016; Lee & Kemple, 2014)	Creative activity in adolescent and adult life, includes: painting, poems, or receiving prize for art-making or craft	In Higher education Teachers and students Elementary teachers
The Ten-Item Personality Inventory (TIPI)	Gosling, Rentfrow, and Swann (2003)	Assess teacher's personality	(Besser & Shackelford, 2007; Donnellan, Oswald, Baird, & Lucas, 2006; Ehrhart, Roesch, Ehrhart, & Kilian, 2008; Ehrhart et al., 2009; Ispir, Elibol, & Sonmez, 2019; Kemple, 2014; Krieger, Becker, Greiff, & Spinath, 2019; Langford, 2003; Muck, Hell, & Gosling, 2007; Rammstedt & John, 2007; Runco & Johnson, 2002; Sibley, Osborne, & Duckitt, 2012; Woods & Hampson, 2005)	The Big Five personality Model measure by Goldberg (1999)	Higher education Teachers and students School teachers
The Instructional Practices Questionnaire I (IPQ-I)	Hong & Nadelson (2005, 2006)	Measures teachers' instructional practices in cognitive, interpersonal, and intrapersonal	(Hong & Nadelson, 2005, 2006; Hong & Hartzell, 2009)	Cognitive, interpersonal, and intrapersonal domain, respectively	School teachers and gifted education General education classroom teachers

Table 1. Measurements found in the literature investigates teachers' creativity

The following section explains the TCNB and the CFTIndex inventory. These measurements measure teachers' creativity behaviors and are based on Cropley's (1997) list of the nine Teacher's creative fostering behaviors. The TCNB is based on some of Cropley's nine aspects plus other characteristics that were found in the literature, and the CFTIndex displays all nine aspects of the teachers' fostering behaviors of Cropley's list. Both inventories share Cropley's (1997) ideas; however, the TCNB is a new inventory that was just developed in 2018 and has been used in only one specific investigation, while the CFTIndex is an extensive inventory and has been used in various studies.

C.4 The Teacher's Creativity Nurturing Behavior (TCNB) Measurement

The Teacher's Creativity Nurturing Behavior (TCNB) Measurement was created for school teachers in a specific investigation to measure the training of skill development that needs analysis. Sharma & Sharma (2018) created the instrument based on Cropley's (1997) review of the nine teachers' creative behaviors and the generated information about the teacher's creative behaviors were found in the literature review. The TCNB measurement was designed to identify the gaps in teachers' behavior that could be developed through training.

The measurement is based on 20 statements scored by a self-rating scale, with *three theoretically distinct subscales.* The 20 statements focus on four aspects of teachers' creativity behaviors: critical thinking, motivation, inquisitiveness, and abstraction. (See Table 2). Each statement was scored using a six-point Likert scale, from 1 (completely disagree) to 6 (agree completely), and the higher scores imply teachers' creativity nurturing behavior.

Factor label	Description
Abstraction	1. Abstraction Ability to provide an opportunity to the student to explore his/her idea
Inquisitiveness	2. Inquisitiveness Ability to encourage the student to question to understand the concept and thoughts
Motivation	3. Motivation Ability to boost the morale of the student and encourage learning from failures
Critical Thinking	Ability to stimulate objective analysis and evaluation of an issue in order to form a judgment

Table 2. Description of the four factors of teachers' creativity by Sharma and Sharma (2018)

The TCNB measurement focuses on specific factors such as: understanding the teachers' perception about creativity, addressing the significant aspects of the school environment, and distinguishing the enablers and the inhibitors at the school (Sharma & Sharma, 2018). The TCNB measurement was used only in one study by Sharma and Sharma (2018). The study involved 356 school teachers in India. The results indicate the TCNB measurement can be used for evaluating the development training skills that are required for school teachers. This measurement would be beneficial for investigating specific factors of teachers' behaviors including abstraction, inquisitiveness, motivation, and critical thinking. The researchers affirmed that the TCNB measurement would be more valuable for programs that aim to recognize the gap in their teachers' behaviors, and are willing to provide training for those teachers in the areas where they need improvement.

The validity of Sharma & Sharma's (2018) scale has been verified through 500 responses of several schools' teachers, principals, and experts in India. The reliability of the TCNB instrument is accepted regarding the values of Cronbach's alpha measure and

by Composite reliability (CR) and the average variance extracted (AVE). Below are the Creativity Nurturing Behavior Scale (TCNB) statements.

1) I question the students' ideas to ponder them to explore it further.

2) To develop critical thinking, I enquire students about their ideas.

3) I keep track of the progress in the students' ideas.

4) I give heed to every student's query.

5) I give students the opportunity to share their ideas and thoughts.

6) I regularly give group assignments as part of the pedagogy.

7) The students have the opportunity to share their ideas and suggestions during the class.

8) The students are expected to work cooperatively in groups.

9) I provide opportunities to students to evaluate and judge themselves.

10) I motivate students to apply the teachings in different contexts.

11) I reinforce the students' behavior to apply their learning in different contexts.

12) The students are motivated to apply their learning in different situations.

13) I am open to listening to distressed students.

14) I counsel students who fail in the task, to boost their morale.

15) I support students to learn from their failures.

16) I encourage students to learn the basics of the topic.

17) I lay emphasis on the proficient learning of essential knowledge and skills.

18) Before sharing my viewpoint on the student's idea, I urge them to explore it further.

19) I don't react immediately to the suggestions of the students, rather give them time.

20) I don't force students to strictly adhere to the directions.

Although the TCNB measurement was based on Cropley's nine principles of creative behaviors, it is a new measurement that was used only in one study. The TCNB is a limited measurement that focuses only on measuring four factors of teachers' creativity behaviors including: abstraction, inquisitiveness, motivation, and critical thinking. For this reason, using a comprehensive instrument such as the CFTIncex would be more valuable in this study.

C.5 The Creativity Fostering Teacher Behaviors Index (CFTIndex)

One and half decades have passed since the publication of the original CFTIndex (Soh, 2000). The CFTIndex measurement appeared in (2000) by Soh Kaycheng, and it has been cited in many studies that examined creativity for different purposes, including assessing the effectiveness of creativity development, identifying strategies that foster creative thinking, and understanding the complexity of teacher's creativity practices (Soh, 2000).

This instrument has been used in many fields of education, including Engineering, Mathematics, Psychology, Business, Game Design, English learning, and Working Organizations. Moreover, the CFTIndex has been translated to many languages, such as Spanish, Chinese, English, and Turkish. Furthermore, it has spread worldwide and been used to investigate a varied range of university and school teachers in different settings and multiple countries, including America (Edinger, 2008), Canada (Hondzel & Catharine, 2013), Chile (Manriquez & Reivera, 2005), Hong Kong (Forrester & Hui, 2007), Korea (Lee & Kemple, 2014), Mexico (Belio & Urtuzuastegul, 2013), Nigeria (Olanisimi, Adeniyi, & Olawale, 2011; Olawale et al., 2010), Singapore(Soh & Seng, 2007), and Turkey (Ayhan Dikici, 2013, 2014).

The conceptual framework of the index was based on the comprehensive review of Cropley's (1997) paper on *Fostering Creativity in the Classroom: General Principles.* The CFTIndex measures the creativity fostering behaviors instructors use in the classroom through social interactions. Cropley (1997) identifies nine principles and behaviors instructors might use to foster creativity, which are independence, integration, motivation, judgment, flexibility, evaluation, question, opportunities, and frustration. More information about this index and how to use it will be explained in Chapter 3.

Soh (2000) conducted several investigations to measure teachers' fostering behaviors that involved the CFTIndex. The first CFTIndex was developed in (2000) and was tested in Singapore with a group of teachers (N = 117). Different studies on the CFTIndex confirmed that this instrument has a strong indication of reliability and validity. As Soh (2015) asserts, there is evidence that the CTFIndex has internal consistency, reliability and concurrent validity. Soh and Quek (2007) explored the validity of the CFTIndex on secondary school teachers in Singapore. Many studies indicated the need for such an instrument as the CFTIndex to study teachers' creativity behaviors (Soh, 2015).

The CFTIndex has provided creativity researchers with the necessary data to achieve their research aims. For instance, Manriquez and Reivera (2005) aimed to discover the pedagogical practices of fostering creativity among university instructors in Chile. Researchers renamed the CFTIndex as Learning Style Self-Assessment Scale. The structure of the nine subscales and eight of the nine subscale names were retained with questions renamed as a consultation, and the original six-point scale was used. The methodology of this study followed the original study of Soh (2000) when the CFTIndex

was developed. The outcomes disclosed enhancing teachers' creative behaviors is a highly valuable objective for modern professional training in higher education. This study does not contribute to theoretical progress; however, the results here do show teachers exhibit creative behaviors in higher education. The results also indicate the CFTIndex is a valid and reliable scale for measuring teachers' creativity behaviors, and thus could be used in other studies in university teaching.

The CFTI has been used with other instruments, such as TIPI and CBI. Lee and Kemple's (2014) study examined three factors in pre-service teachers, including teachers' personality traits, engagement in creative activities, and beliefs about their teaching practices. The study involved a total of 302 early childhood and elementary pre-service teachers from a southern university in the USA. They measured the relationship between pre-service instructors' personality traits, involvement in creative activities, and teachers' beliefs about teaching activities that support children's creativity. The following instruments were used: The Ten Item Personality Inventory (TIPI) for personality traits, the Creative Behavior Inventory (CBI) for involvement in creative activities, and the Creativity-Fostering Teacher Behavior Index (CFTI) for teachers' creativity behaviors. The CFTIndex was modified to have just three items each for the nine subscales instead of the original five items. The results disclosed there is a significant relationship between the instructor's beliefs and the openness trait toward classroom practices that foster creativity. The study also revealed personality traits can be a predictor of teachers' creativity fostering behaviors. This proposes the CFTIndex is a flexible scale that can be used entirely or partially.

In another study the CFTIndex was used with two other instruments: the Gough's Creative Personality Scale, which has 30 adjectives, and a Chinese creativity test. Researchers used these three instruments for data collection plus class observation for teachers teaching, and measuring students' verbal and figural creativity by using the CFTIndex. Forrester and Hui's (2007) research was based on the hypothesis: "If teachers saw value in creativity as integral to their effective teaching, observed teachers' classroom behavioral choices would reflect a significant array of creativity-enhancing techniques" (p. 7). The study was conducted on primary school teachers who had taught for at least eight years. The results showed correlations between teachers' creativity, fostering behaviors, and students' creativity for both verbal and figural actions. Moreover, gender, teaching experience and teachers' qualifications did not influence teachers' scores for the CFTIndex subscales. The researchers pointed out the research question remained unanswered, but their pathway led to possible answers. They also acknowledge in-depth investigations on teachers' creativity nurturing behaviors, and future researchers must use data collection instruments based on classroom context. This suggests the CFTIndex is an instrument that can be applied in investigations that aim to measure teachers' and students' creative behaviors in one classroom.

In addition, several researchers have explored the CFTIndex and translated it to other languages such as Chinese. Within the investigation of primary school teachers, Chan and Yuen (2015) examined the relationship between teachers' creativity beliefs, creative personality, and creativity-fostering behaviors with 399 school teachers. The researchers translated the CFTIndex into Chinese and modified the scale from six-point, which is the original version, to five-point. They found a correlation among the

CFTIndex subscales and teachers' creativity beliefs, and between the subscales and creative personality.

The CFTIndex also was translated into Turkish. Dikicis' (2013) conducted three studies and used the Turkish version. In one study, the author used the original six-point scale to examine the language equivalence of the CFTIndex for its validity and reliability when used on Turkish teachers. The participants completed the original English version first; after one week, they completed the Turkish one. The study showed there is a high correlation between the Turkish and English index, and the Turkish index demonstrates a similar construct of validity. This indicates that the CFTIndex is a valid instrument that can be translated into other languages and provide accurate results.

The CFTIndex can also be used in mixed methodology research. In Ontario, primary school teachers were investigated to identify their creativity fostering behaviors, perceptions of creativity, and the environmental challenges. Handzel (2013) study involved two stages: in the first stage, the teachers completed the CFTIndex online, and in the second stage, the researcher interviewed and observed teachers in the classroom. The researcher concluded there are uncontrollable environmental factors which influence teachers' creativity practices, such as administrators and colleagues. The results also revealed some teachers used multifarious ways for creativity fostering. To foster students' creativity, teachers must use strategies then "emphasize the well-rounded and imaginative development of children while tolerating behaviors associated with creative production" (Hondzel, 2013, p. 123). This suggests following the structure of this study in higher education can provide a lot of information about the approaches that teachers take toward fostering creativity.

In another mixed methodology study, Edinger (2008) examined creativity fostering behaviors used by 9th and 10th-grade teachers in a high-stakes standardized testing environment.

The researcher used three methods for data collection, including the CFTIndex, classroom observation, and face-to-face interviews. The conclusion revealed that teachers' creativity fostering behaviors and abilities were influenced by both personal and environmental factors.

Teachers' creative abilities can possibly be developed through supportive administration and instructional peers. They recommend using the CFTIndex for more beneficial in-depth qualitative research and investigations exploring the relationship between creativity abilities and experience of teaching.

The CFTIndex is a highly reliable instrument if used as a whole or partially, because of the internal consistency of its nine subscales, which also have reasonably high reliability. Olawale, Adeniyi, and Olubela (2010, 2011) investigated teachers' productivity in two studies that both substituted the original CFTindex six-point scale with a five-point scale, without explaining this change. In 2010, the researchers studied forty university instructors in Ogun and Oyo States to determine if teachers exhibited productivity and capacity building based on their creativity fostering behaviors. The results concluded university teachers in Ogun and Oyo States exhibited a good amount of productivity. In 2011, Olanisimi, Adeniyi, and Olawale examined primary school teachers to ascertain actions of creativity fostering behaviors. The findings declared educators must possess creativity fostering behaviors in their teaching, specifically when they are dealing with students with special needs. Overall, it was revealed the CFTIndex

has high reliability that remains consistent even with changing the subscales to five. This indicates the scale and subscales can be trusted in terms of reliability even if used in a shorter form.

The CFTIndex has also been used to compare teachers' and students' perceptions of teachers' creativity fostering behaviors. Belio and Urtuzuastegul (2013) examined faculty member's creativity fostering behaviors orientations and students. The CFTIndex was translated from English to Spanish. The original CFTIndex scale was used on both teachers and students; however, some modifications were made to the students' index version. The outcomes revealed there were many aspects that influence effective teaching. It was concluded it is important for teachers to involve creativity in their teaching, particularly in-class activities, and have a supportive environment. In this study teachers believed they were very creative in their teaching, while students felt that their teachers were moderately creative.

Similarly, Ismail, Yusof, and Pappu (2013) used the original CFTindex to collect data from teachers and adapted the same scale to explore their students' perception of creativity in a Mathematics class. The researchers compared teachers' self-perception of creativity and student perceptions of their teachers' behaviors respectively. The result indicated the teachers showed a high level of fostering creativity behaviors in teaching. The findings showed teachers scored higher than students on Independence and Judgement and lower on the rest.

This suggests in classrooms students' receptions of teachers' practices might be seen differently than teachers' expectations. This indicates teachers need to pay more attention to classroom activities when they set and design them.

The following table compares the two instruments discussed in the above section.

Inventory	Developer	Measuring	Studies	Based on	Area of investigation
Teacher's Creativity Nurturing Behavior (TCNB) Measurement	Sharma & Sharma (2018)	Identify the gap in teachers' behaviors that could be developed by training	(Sharma and Sharma, 2018)	Cropley's (1997) nine teachers' creative behaviors, and aspects from the literature review about teacher's creative behaviors	School teachers
The Creativity Fostering Teacher Behaviors Index (CFTIndex)	Soh (2000)	Instructional and measurement tool of creativity fostering behaviors	(Siu & Wong, 2015; Belio & Urtuzuastegul, 2013; Dikici, 2014; Dikici & Soh, 2015; Forrester & Hui, 2007; Lee & Kemple, 2014b; Soh, 2017; Azhari & Zaleha, 2018; Konstantinidou, 2018; Manriquez & Reivera, 2005; Olawale, Adeniyi, & Olubela, 2010)	Cropley's (1997) nine teachers' creative behaviors	Higher education Teachers Primary Secondary and High school Teachers

Table 3. Measurements found in the literature that investigates teachers' creativity based on Cropley's (1997) list of the nine Teacher's creative fostering behaviors.

To summarize, the above literature review helps us understand the relevance and value of encouraging creativity. Creativity is recognized as a vital quality for the future, as well as an important aspect of students' development, growth and innovation. Creative teaching and teaching for creativity could be applied in all disciplines. Several strategies of creative thinking and problem solving allow teachers to encourage creativity on a daily and informal basis. However, what is needed to develop students' learning is to infuse all the educational aspects of creative thinking, and to prompt students' creativity.

The literature might provide a few clues for understanding how to foster students' creativity; however, the current higher education structure is lacking attention to do so. The investigations on teaching creativity in higher education and design are limited and

do not provide a comprehensive explanation of teachers' classroom practices that encourage creativity. Thus, teaching creativity deserves to be paid increased attention due to its benefits for students, especially in higher education.

Researchers explain creativity in a variety of different ways. Teachers also have diverse opinions and conflicting views about teaching creativity, which leads them to exhibit positive or negative applications in the classroom. This review highlighted the incongruence between teachers' positive beliefs about creative development, and the disconnect between those beliefs and their actions of classroom practices.

The available literature identifies, describes, and provides a clear understanding of the factors that form teachers' perceptions or beliefs about creativity, teachers' personality or characteristics, and teachers' behaviors of creativity. The successful implementation of creativity in education relies on three factors of teachers' beliefs, characteristics, and behaviors. Current investigations concentrate on these three factors and mainly investigate K-12 teachers, which indicates the gap in higher education.

Overall, this study investigates the creative behaviors design instructors demonstrate in their teaching in college-level design classrooms. There are several measurements that have been discussed in the literature and have been used to measure teachers' creativity behaviors. Some of these measurements focus on specific teaching aspects and measure specific behaviors of teachers' practices. In this study, the CFTIndex will be used. Not only does it validity and reliability, but it is the only measure concentrates on the creativity fostering behaviors in the classroom context. By using the CFTIndex to select teachers who demonstrate the highest creative behaviors, the study may identify the creative fostering behaviors and practices.

Chapter III. Methodology

Overview

Many studies have investigated creativity in education, far fewer have assessed the instructor's creative behaviors in design education. Only a few of these studies evaluated instructors' classroom practices (Torrance, 1963; Johnston & Pennypacker, 1980; Aljughaiman & Mowrereynolds, 2005; Runco, 2014). This gap of knowledge makes it necessary to investigate and to reveal the effective practices and teaching methods that most creative design instructors practice in their classroom. This chapter explains the process and assessments that will be used in this study. The outline is based on the literature review and the discussion presented in Chapter two.

The research questions of this study are:

1. What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom?
2. How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses?
3. What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

Hypothesis

There are a variety of methods that foster student's creativity used by design instructors.

H1: Design studio instructors score higher in CFTIndex than other non-studio design instructors.

H2: The CFTIndex will not reveal all the instructor's creative behaviors that design instructors demonstrate in their teaching.

Rationale for Approach

Most studies involving the CFTIndex and creativity have relied exclusively on a quantitative approach to measure how many creative behaviors instructors perform in the classroom. In this study, the researcher will use a mixed methodology approach to explore the research questions in depth. Mixed methods researchers collect and analyze the data using a variety of approaches rather than relying on only one (Creswell, 2013).

A mixed-method approach has been employed in many studies in the field of education as a "suitable method to strengthen research results" (Bloomberg & Volpe, 2012). Creswell, (2003) asserts that "the best understanding of a research problem" can be achieved by using both quantitative and qualitative data (p. 12). A mixed-method approach can reveal a variety of different perspectives, which gives a deeper understanding of the topic being investigated. Moreover, this approach reduces the weaknesses that might occur because of the applied measurements (Creswell, 2013).

This study begins with a quantitative approach using the CFTIndex and subsequently combines it with a qualitative approach. Qualitative methodologies emphasize "discovery and description" followed by "interpreting the meaning of experience" (Bloomberg & Volpe, 2012). Interviews will allow instructors to describe their creative practices, beliefs, and behaviors in detail, which will assist the researcher to comprehend the thinking process of instructors.

Thus, using quantitative and qualitative approaches in this study will help the researcher explore the topic from different angles to get a full understanding of the phenomenon of creative behaviors that design instructors demonstrate in their teaching.

Using interviews and observation in addition to the CFTIndex allows for triangulation to strengthen the results.

Sample Description and Selection

The target participants of this study are design instructors working at the College of Design at the University of Minnesota, Twin Cities. This presentable sample of this university was selected for many reasons:

1. The College mission is to apply design thinking and prepare students to overcome big and small issues in work fields.
2. The design programs at the University of Minnesota are aimed to train students to implement unique ideas through technologies by fostering students' creativity in all the design fields.
3. The researcher is a student at the University of Minnesota and familiar with the school environment. This insider positionality can encourage participants to participate and respond.
4. The University of Minnesota is one of the largest research universities in the country and the College of Design is considered a convenience sample to contact or reach.

The instructors in this study were chosen for many reasons:

1. They have experience in teaching design in higher education for at least five years.
2. They have a Master's or Ph.D. degree and they teach a variety of subjects at both graduate and undergraduate levels.

Overview of Research Design

This study will involve a qualitative and quantitative investigation of design instructors' creativity fostering behaviors and beliefs.

This mixed-method is considered appropriate because it will involve three approaches to achieve the research questions:

First, the online survey using the CFTIndex will allow the researcher to compare the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach non-studio classes.

Second, the interview questions developed in the literature review will focus on investigating the instructors' creative beliefs, behaviors, and practices in depth (Patton, 2002).

Phase 1: Measuring instructors' Creative behaviors using CFTIndex

The CFTIndex was chosen for this research because it measures the creative behavior that fosters students' creativity. The literature review reveals many studies have used instruments that measure students' creativity; far fewer have investigated teachers' creativity fostering behaviors and practices on student creativity development in higher education (Dikici & Soh, 2015). Many studies have used different tests to investigate whether teachers' performance enhances or inhibits creativity (Torrance, 1963; Runco, Johnson, & Bear, 1993; Runco, 2014). However, to understand how teachers enhance creativity, the CFTIndex measures creative behaviors and actions that teachers engage in their practices.

The Creativity Fostering Teacher Behavior Index (CFTIndex) was developed by Soh (2000) to measure teachers' behaviors that foster students' creativity. The conceptual framework was based on an extensive literature review of instructors' creativity by Cropley (1997). In his paper "Fostering Creativity in the Classroom: General Principles" Cropley (1995, p. 20) developed nine principles to foster students' creativity.

1. Independence: It focuses on encouraging students to learn independently.
2. Integration: It focuses on teaching a co-operative and social style.
3. Motivation: It focuses on motivating students to master knowledge and divergent thinking.
4. Judgment: It focuses on holding judgments of students' ideas until they formulate.
5. Flexibility: It focuses on encouraging flexible thinking.
6. Evaluation: It focuses on promoting students' self-evaluation.
7. Question: It focuses on giving serious attention to students' questions and suggestions.
8. Opportunities: It focuses on providing many opportunities and materials to students through multiple situations.
9. Frustration: It focuses on assisting students to deal with frustration and failure and try creative ideas.

The CFTIndex has been used in different studies by researchers in America, Canada, Chile, Hong Kong, Korea, Mexico, Turkey, and Singapore for varied purposes (Forrester & Hui, 2007; Hondzel, 2013; Lee & Kemple, 2014; Dikici, 2014). It has been used in many studies for measuring teachers' creative fostering behaviors and for other different purposes of creativity development (Soh, 2000; Manriquez & Reivera, 2005; Soh & Seng, 2007; Forrester & Hui, 2007) with high validity (Forrester & Hui, 2007; Edinger, 2008; Olawale et al., 2010; Olanisimi, Adeniyi, & Olawale, 2011; Belio & Urtuzuastegul, 2013; Dikici, 2013; Hondzel & Catharine, 2013). The index evaluates teachers' creative behaviors and is recognized for its validity: "the reliability coefficients

are sufficiently high for the subscales and the CFTIndex as a whole to be used with confidence for research purposes" (Soh, 2015).

The CFTIndex scales 45 statements where teachers' self-describe their creative behaviors through an adjectives checklist (see references in Table 4). In the index, Cropley's (1995) nine teachers' creativity behaviors principles are examined through five different statements.

The 45 questions use a 6-point Likert scale to evaluate instructors' actions. The test will provide directions for scoring and one example as a guide: (6) indicates the highest level of performance of creative behaviors, (1) indicates the lowest. Table 4 below displays an example of the questions. All survey participants will be entered in a random drawing for a gift card as an appreciation for their time.

Statements	**Rates** All the time 6 5 4 3 2 1 Never
1. I encourage students to show me what they have learned on their own.	6 5 4 3 2 1
2. In my class, students have opportunities to share ideas and views.	6 5 4 3 2 1
3. Learning the basic knowledge/skills well is emphasized in my class.	6 5 4 3 2 1
4. When my students have some ideas, I get them to explore further before I take a stand.	6 5 4 3 2 1
5. In my class, I probe students' ideas to encourage thinking.	6 5 4 3 2 1
6. I expect my students to check their own work instead of waiting for me to correct them.	6 5 4 3 2 1

7.	I follow up on my students' suggestions so that they know I take them seriously.	6	5	4	3	2	1
8.	I encourage my students to try out what they have learned from me in different situations.	6	5	4	3	2	1
9.	My students who are frustrated can come to me for emotional support.	6	5	4	3	2	1
10.	I teach my students the basics and leave them to find out more for themselves.	6	5	4	3	2	1
11.	Students in my class have opportunities to do group work regularly.	6	5	4	3	2	1
12.	I emphasize the importance of mastering the essential knowledge and skills.	6	5	4	3	2	1
13.	When my students suggest something, I follow it up with questions to make them think further.	6	5	4	3	2	1
14.	I encourage my students to ask questions freely even if they appear irrelevant.	6	5	4	3	2	1
15.	I provide opportunities for my students to share their strong and weak points with the class.	6	5	4	3	2	1
16.	When my students have questions to ask, I listen to them carefully.	6	5	4	3	2	1
17.	When my students put what they have learnt into different uses, I appreciate them.	6	5	4	3	2	1
18.	I help students who experienced failure to cope with it so that they regain their confidence.	6	5	4	3	2	1

19. I leave questions for my students to find out for themselves.	6	5	4	3	2	1
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.	6	5	4	3	2	1
21. My students know that I expect them to learn the basic knowledge and skills well.	6	5	4	3	2	1
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	6	5	4	3	2	1
23. I encourage my students to think in different directions even if some of the ideas may not work.	6	5	4	3	2	1
24. My students know that I expect them to check their own work before I do.	6	5	4	3	2	1
25. My students know I do not dismiss their suggestions lightly.	6	5	4	3	2	1
26. My students are encouraged to do different things with what they have learned in class.	6	5	4	3	2	1
27. I help my students to draw lessons from their own failures.	6	5	4	3	2	1
28. I teach students the basics and leave room for individual learning.	6	5	4	3	2	1
29. I encourage students to ask questions and make suggestions in my class.	6	5	4	3	2	1
30. Moving from one topic to the next quickly is not my main concern in class.	6	5	4	3	2	1

31. I comments on students' ideas only after they have been more thoroughly explored.	6	5	4	3	2	1
32. I like my students to take time to think in different ways.	6	5	4	3	2	1
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	6	5	4	3	2	1
34. I listen to my students' suggestions even if they are not practical or useful.	6	5	4	3	2	1
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	6	5	4	3	2	1
36. I encourage students who have frustration to take it as part of the learning process.	6	5	4	3	2	1
37. I leave open-ended questions for my students to find the answers for themselves.	6	5	4	3	2	1
38. Students in my class are expected to work in group cooperatively.	6	5	4	3	2	1
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	6	5	4	3	2	1
40. I encourage students to do things differently although doing this takes up more time.	6	5	4	3	2	1
41. I allow students to deviate from what they are told to do.	6	5	4	3	2	1
42. I allow my students to show one another their work before submission.	6	5	4	3	2	1

43. I listen patiently when my students ask questions that may sound silly.	6	5	4	3	2	1
44. Students are allowed to go beyond what I teach them within my subject.	6	5	4	3	2	1
45. I encourage students who experienced failure to find other possible solutions.	6	5	4	3	2	1

Table 4. The Creativity Fostering Teachers Behaviors Index questionnaire (Soh, 2000)

The purpose of the first phase of this study is to know the average level of creativity teaching behaviors amongst the college of design instructors. Moreover, using the CFIndex allows answering the second question of this study, which involves comparing the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach non-studio classes.

A survey was sent to 130 instructors across the college of design, including Apparel Design, Interior Design, Retail Merchandising, Landscape Design & Planning Architecture, Product Design, and Graphic Design, asking them to participate in this study and rate their creativity behaviors. An email was sent with an enclosed web link embedded from Qualtrics that included a survey with CTFIndex, and other information. The online survey included 45 questions that used a 6-point Likert scale to evaluate instructors' actions.

Data Collection and Analysis Procedures

The researcher got 41 responses; however, only 37 participants completed the survey. The data collected included instructors' demographic information (gender, age), educational degrees, teaching experience, academic programs (for example, Architecture,

Landscape, Apparel, etc), students' standing levels, and primary courses they teach and modality (studio or lecture class) (Reference Appendix F). Those 11 participants represented a variety of demographics and CFTIndex scores. Six participants were teaching studio classes, three teach lecture classes, and two teach both studio and lecture classes. Of the survey participants (n=37), 17 were men, 19 were women, and 1 person did not reveal his or her gender. All the participants teach college students at the undergraduate and graduate levels. Participants were diverse in terms of age, with the largest group indicating they were between 50-59 years of age (n = 15). See Table 6 for more details. For the participants' educational degree levels, most interviewees have master's degrees (n=19), while 13 have Ph.D. degrees, and six have bachelor degrees. See Table 7 for more details. Almost half of the participants teach studio classes (n=19), while 10 participants teach both studio and lecture classes, and 7 teach only lecture classes. Most the participants have teaching experience of at least 23 years. Ten participants have teaching experience from 12-17 Six participants have teaching experience from 2-6 years, whereas the other five participants teach from 7-11, See Table 9 for more details.

The responses collected from the CFTIndex results were analyzed by using SPSS. The overall mean for the CFTIndex score for the 37 survey participants was 228. Independent-sample t-tests were conducted to compare the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach lecture classes. The results show that there were no significant differences in the instructor's creativity-fostering behaviors test scores results when they teach studio classes *(M = 228.53, SD = 26.235)* and lecture classes *(M = 232, SD = 20.183)* conditions; $t(24) = -.316$, $p > .05$.

These results suggest instructors' creativity-fostering behaviors are not significantly different if they teach studio classes or lecture classes, which means both instructors display the same level of creativity behaviors in the classroom.

Additional statistical tests were run between the design instructor's creativity-fostering behaviors test results, and other variables. A correlational analysis was also used to examine the data for relationships between CFTIndex test results and years of teaching experience.

The five groups of instructor's teaching experience were compared with each other. See Table (10) to check the five groups' age range details. The comparisons included comparing the first group with other five different groups (teaching experiences from 2 to 6 years) with the second group (teaching experiences from 7 to 11 years) there were no significant differences. Besides, the first group (teaching experiences from 2 to 6 years) with the third group (teaching experiences from 12 to 17 years) there were no significant differences.

However, the results also show there were significant differences in the instructors creativity-fostering behaviors test scores results comparing the first group teaching experience (teaching experiences from 2 to 6 years) *(M = 246.33, SD = 10.017)* and group five (teaching experiences from 18 to 22 years) *(M = 209.33, SD = 11.639)* conditions; $t\ (7) = 4.672,\ p < .002$ These results suggest instructors' creativity-fostering behaviors are varied amongst instructors who teach for a long period of time from 18-22 years. This suggests when instructors teach for a long period of time, they show more creativity-fostering behaviors in their teaching.

Further analysis revealed there were significant differences in the instructors' creativity-fostering behaviors test scores results comparing with their number of years of teaching experience (teaching experiences from 2 to 6 years) *(M = 209.33, SD = 11.639)* and group six (teaching experiences from 23 years and above) *(M = 237.31, SD = 23.708)* conditions; $t\ (17) = -2.713,\ p < .015$

These results indicate instructors' creativity-fostering behaviors are varied amongst design instructors. The design instructors who teach for a long period of time, for 23 years and above, demonstrate more creative teaching behaviors. This also suggests when instructors gain more years of teaching experience, they see themselves as more likely to motivate students and demonstrate more creative behaviors that enhance creativity.

Phase 2: Interviews

The purpose of the second phase of this study is to interview design instructors and to learn about the beliefs, practices, and creative behaviors that they demonstrate in their teaching to foster students' creativity in the classroom. A related goal is to learn about the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results.

Before the interviews, the researcher emailed the participants a copy of the consent form with the Zoom invitation links and asked them to sign it, (Appendix C). The consent form included an explanation of the study, the procedure, the risks of participating and the terms of confidentiality to ensure the participants' understanding. The protocols were red (check Appendix E) to remind the participants of what they had consented during the study. At the beginning of the interviews, each participant was

asked for a verbal agreement to record the interview and was reminded of the terms of confidentiality.

The interview questions were about instructors' beliefs and practices on fostering creativity in the classroom, as follows:

1. What does creativity mean to you?
2. What does it mean to be a creative instructor?
3. Why is it important to foster students' creativity?
4. What is your perspective on fostering students' creativity in the classroom?
5. How do you foster your students' creativity? Can you describe two ways?
6. What are the most behaviors and attitudes that might foster your students' creativity? Can you give me some examples?
7. What are the classroom activities and practices that foster your students' creativity the most? Can you give me some examples?
8. How do you measure the impact of your creative practices on students' creativity development in the classroom? Tell me your experience with that?
9. What are the environmental factors that could impact your classroom practices and foster students' creativity? Would you give me some examples?

Data Collection and Analysis Procedures

Invitations were sent to 34 participants, and 11 agreed to be interviewed. The semi-structured interviews were conducted by Zoom, for the safety of the participants from COVID. Each interview took a minimum of one hour. The interviews focused on the participants' teaching experiences and perceptions about teaching creativity, as well as their beliefs and classroom practices. The interview questions were sent to five

participants in advance based on their request. Each participant had a digital file that included the audio record. The audio files were coded to match the participant database. All the files were securely stored on a password protected computer. Each participant was asked all the nine questions. The grant received from the Graphic Design Department was used for transcribing the participants' records. The eleven participants were identified in the findings as Participant A through Participant K.

After transcribing the interviews and getting familiar with the data, the text was analyzed through an analytic process for content and consideration of "big ideas or themes" (Bloomberg & Volpe, 2012). Through the analysis, the researcher followed Bloomberg & Volpe's (2012) process of data analysis, which is based on identifying common patterns, questioning the data, creating codes, comparing themes, and coming up with categories. The data analysis used Zhang & Wildemuth's (2009) methods, which focuses on "classifying all the collected data" from words into a narrative format according to the research questions. The process concentrated on the content analysis for "meanings and themes" (Zhang & Wildemuth, 2009). Also, the coding process included looking at patterns through the participants' responses and creating multiple elements that grouped under each question (Saldana, 2016).

In data analysis, the NVIVO software was used as a tool to assist the process of categorizing, grouping, and classifying the relevant elements of the participants' transcripts.

The transcripts were reviewed multiple times to get familiar with the script. The descriptive data was interpreted, coded, and analyzed to identify the design instructors'

creativity behaviors and practices in the classroom that they believe as important to creativity.

At first, short phrases and words were selected, and then another round to overlook "pre-coding" was applied (Saldana, 2016). In the first round the coding included underlining the big ideas for each participant's response to the question. The second round of precoding included highlighting and coloring the significant quests that were striking or worthy of attention, i.e.

"cod-able moments" (Saldana, 2016). The second round also included merging the ideas from the data through the attribute and elemental coding process. The two phases of coding were based on Saldana's (2016) recommendation, as stated "two or more are needed to capture the complex process of phenomena in your data." (p. 69).

Later, thematic analysis was executed using Braun and Clarke's (2006) coding method, which focuses on "identifying, analyzing, and reporting patterns (themes) within data" (p.79). This method of coding and data organization offers an opportunity to interact with the scripts and sort themes through ideas and concepts that are common among interviewees (Braun & Clarke, 2006). Within each question of the interview, the themes were categorized, developed, and some were combined, and later they were linked back to answer the three research questions.

Ethical Considerations and Issue of Trustworthiness

This research investigates instructors' creativity fostering behaviors in higher education classrooms. The methodology used in this study was informed by Braun and Clarke (2006), Zhang and Wildemuth (2009), Bloomberg and Volpe (2012), and Saldana (2016).

To start this study, the research design was sent for a review by the Institutional Review Board (IRB) to ensure the safety of the subjects and inviolable human rights. The IRB approval is provided in Appendix G. After getting approval from the IRB, the researcher was guided by their doctoral advisor and monitored in each step of the study to ensure compliance.

Confidentiality measures were achieved and implemented throughout the study by concealing participants' identities, e-mail address, and names. The researcher kept all the information from surveys and interviews stored on a secure computer in order to maintain strict confidentiality. The researcher worked alone on the data analysis, which included calculating CFTIdex test results and interpreting the interviews coding process.

To ensure that participants were aware of the circumstances and study risks, the consent forms were sent in advance before the interviews to all the participants. The consent form included all the information about the study and asked them to sign to ensure that they were aware of the conditions of the study. Besides, before each interview, the researcher repeated reading the consent form and confirmed their approval to record the interviews. The researcher notified all the participants that this study was voluntary and that they could ask any questions during the interview for clarification.

For the issue of trustworthiness, this study used different approaches for data collection to achieve reliability. The participants of the study were selected through the survey that was sent to 130 instructors across the college of design--including Apparel Design, Interior Design, Retail Merchandising, Landscape Design & Planning Architecture, Product Design, and Graphic Design--asking them to participate in this study and rate their creativity behaviors. The participants who completed the survey were

37 instructors; all of them were invited to the interview except four members (the research committee of this study); however, only 11 agreed to participate in the interview phase. Those 11 participants represented a variety of demographics and CFTIndex scores.

Limitations of Study Design

This study has potential limitations related to the researcher's biases or assumptions of data interpretation and findings. These biases will be taken into consideration in this study design during the interviews with participants, coding, data analysis, and the results. All research is designed and based on the phenomena of the study and its questions. This study is limited to the sample size and demographics of instructors who will complete the survey and agree to be a part of this research within the University of Minnesota, College of Design. Due to the research methodologies of the limited number of participants, and because the participants were selected from one sample university, the study results cannot be generalized to the population of design instructors or the entire population. Moreover, the small sample of the participants who completed the CFTIndex (38), and interviews (11) might be due to the challenges that instructors faced with moving instruction online, such as the time constraints discussed by the interviewees. The sample demographics may have several variabilities (i.e. age, gender, teaching experience, CFTIndex results, classes they teach, field of teaching, etc.) that could affect answering the research questions. Using Zoom instead of face to face interviews, and time devoted to conduct the interviews could be a factor that caused the participants to feel stressed during the interviews, also, the COVID pandemic effect on teachers, the amount of questions, or the type of the questions were unexpected.

Using the CFTIndex as an assessment to measure instructors' creativity behaviors might be also a limitation of this study. The CFTIndex relies upon self-assessment of creativity fostering teaching behaviors, which means that instructors have to rate themselves based on their personal opinions of creativity behaviors.

Some instructors might give themselves higher or lower scores, which could impact the final results. Moreover, some instructors might misinterpret the meanings of the CFTIndex statements, leading to inaccurate self-assessments. The test scoring and results are subject to human error and interpretation. The interviews may produce subjective data because the results are based on instructors' self-reporting of beliefs and practices. Instructor efficacy as reported in the results may have been influenced by different aspects related to instructor personality.

Summary

This research is based on a mixed methodology approach to measure and understand instructor creative fostering behaviors by using the CFTIndex. This study is designed to answer three research questions:

1. What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom?
2. How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses?
3. What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

The research was conducted in two stages. The first stage involved quantitative investigation using the CFTIndex. The CFTIndex was sent out as an online survey across

the College of Design instructors to measure their creativity fostering teaching behaviors and to compare the differences between design instructors who teach studio vs. non-studio courses.

The participants of this study were design instructors working at the College of Design at the University of Minnesota, Twin Cities. A survey was sent to 130 instructors across the college of design. The participants who completed the survey were 37 instructors who completed the survey. Of these, 34 instructors were invited to participate in the second phase; however, only 11 instructors agreed to participate.

The second stage included a qualitative approach. Semi-structured interviews were conducted through Zoom with 11 participants. The interview questions were about the instructors' creativity behaviors, practices, and beliefs about creativity. The data was interpreted, coded and analyzed to answer the first two research questions: 1- What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom? 2- What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

This study was not conducted to judge an instructor's creativity or value a specific classroom practice. Indeed, the aim of this study was to investigate creativity and synthesize the experiences of teaching creativity in the classroom. Rather, this study was designed to explore and understand creativity-fostering beliefs, behaviors, and practices that design instructors demonstrate in their teaching. This study design was developed to address these topics. The findings of this methodology are explained in Chapter 4.

Chapter IV: Findings

Overview

This study investigated design instructors' creativity fostering behaviors, beliefs, and practices in the classroom. The study aimed to explore these creativity factors in three ways. First, by examining the related literature. Second, by conducting a quantitative investigation that measures the design instructor's creative behaviors using the CFTIndex. Third, by conducting a qualitative investigation that identifies design instructors' creativity beliefs and practices, here's how those work together. More specific research questions posed for this study were:

1-What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom?

2- How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses?

3- What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

The proposed hypotheses of this study were:

There are a variety of methods that foster students' creativity used by design instructors.

H1: Design studio instructors score higher in CFTIndex than other non-studio design instructors.

H2: The CFTIndex will not reveal all the instructor's creative behaviors that design instructors demonstrate in their teaching.

This study design used a mixed-method approach to explore the research questions in two phases. In the first phase, the data were collected by using a survey that measures the College of Design instructors' creativity teaching behaviors that were demonstrated in their teaching using the CFTIndex. The survey was sent to 130 instructors across the College of Design.

The data collected included instructors' demographic information (gender, age), educational degrees, teaching experience, academic programs (for example, Architecture, Landscape, Apparel, Housing, Interior and Graphic design.), students' standing levels, and primary courses they teach and modality (studio or lecture class).

A total of 41 participants participated in this study; however, only 37 participants completed the survey. In the second phase, interviews were conducted to identify design instructors' creativity beliefs, and practices. Invitations were sent to 34 participants and 11 agreed to be interviewed. Five participants were men, and six participants were women. Those 11 participants represented a variety of demographics and CFTIndex scores. Six participants were teaching studio classes, three teach lecture classes, and two teach both studio and lecture classes.

The semi-structured interviews were conducted by Zoom. Each interview took one-hour minimum. The interviews focused on the participant's teaching experiences and perceptions about teaching creativity, as well as their beliefs and classroom practices. The interview questions were sent to five participants in advance based on their request. The descriptive data was interpreted, coded, and analyzed to identify the design instructors' creativity behaviors and practices in the classroom that they believe as important to

creative instructions such as: being motivated, enthusiastic, and flexible, as well as having an open mind and empathy for students.

For data analysis, NVIVO software was used to organize the relationships between design instructors' creative behaviors, beliefs, and practices and how they are defined in design education. The data analysis included obtaining descriptive statistics and a T-test to compare the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach non-studio classes.

The pilot study was conducted in the spring of 2018 to test the interview questions and logistics of conducting the study.

The elven participants are identified in the findings as Participant A through Participant K. This chapter explains the process and results of the data analysis for the final study.

The knowledge that arises from this study reveals the views of design instructors' creativity teaching and shares their personal experiences, beliefs, and practices. The interviews findings summarize the insights of the eleven participants who participated in this study, which are organized into four major discoveries.

The first discovery defines creativity as a multifaceted phenomenon and creative instructors have specific attributes.

The second reveals how design instructors' perspectives on fostering students' creativity in the classroom are interrelated.

The third explains there are several activities and practices design instructors apply in their classroom teaching to foster students' creativity. They use multiple approaches to develop and evaluate the effectiveness of these practices.

The fourth describes the factors influencing creativity in classroom practices.

The findings that emerged from the analysis are presented below and discussed later in Chapter 5.

Interpretation of the Findings

Finding 1: Design instructors define creativity as a multifaceted phenomenon and creative instructors have specific attributes.

Although the participants described creativity differently, they shared an understanding of creativity as a broad design concept, which could be defined as an alternative way of thinking or looking at things from different perspectives. Some participants explained creativity as a method, as Participant K stated: *"Making things that don't yet exist or to reconfigure things that do exist into different things."*

According to all participants, creativity is a process that requires a series of actions such as: thinking, trying, making, discovering, explaining, engaging, finding, exploring, developing, understanding, imagining, solving, and creating. Participants believed creativity is for everybody, anyone has the potential to be creative, and creativity is a skill anyone can develop and improve over time with practice. In this study, instructors agreed creativity is important in teaching design because it leads to discovery, evolution, and innovation, as Participant A said: *"Education is all about presenting new ways to think about what else in the world."*

The interview results indicated in classroom creativity focuses on three factors: person, process, and product, which is related to the four Ps theory of (Rhodes). The three creativity factors: person, process, and product were discussed separately and heavily many times during the interviews. However, the three factors were not named or mentioned clearly in the interviews, they appeared during the data analysis.

Overall, each factor was categorized and explained based on the specific components and attributes that were manifest.

Creativity

Every person has an *"Innate tendency to be creative"*(Participant B). The findings concluded two major topics were discussed about the person's creativity, which is related to the instructor, and student.

In the interviews, some participants explained how creativity was developed through their upbringing and childhood. One participant stated creative development starts from the person's family and childhood. Providing an environment supports each person's unique skills, may assist individuals to reveal their style of creative expressions in the future. According to Participant A, his childhood activities such as reading, observing, imaging, drawing, and building things, impacted and sparked his creative career:

> *I think I grew up in a fairly creative family. My father was a landscape architect. Was very artistic and so what he did for a living and our home place. He was very spontaneous and could draw and he could connect to what he was imagining….So I felt like I got a really good start,…. And yet, of course, it started to become this kind of collection of ideas from my past. And I realized that I'd seen, read, imagined, drawn, observed, made things and I'd gone places. I'd experienced a lot of things with my dad. I like to draw. I like to build things as well. And so all of a sudden, I started to realize that I've got the tools or at least I've got the beginning to show kind of develop the greater tools that I need.*

Participants stated using creativity is not limited to design or education, but also appeared in the participants' daily activities, their working field, and personal self-expression, as Participant C explained:

And we can use design and creativity related to our individual profession. But I think in terms of humankind on the planet. It's more important that we expand our role

as creative designers ... When we work with our clients and we try to educate our clients about the changes that are taking place in the world we try to move their little box.

It is a part of a person's being and identity whether a professional or teacher, as Participant H asserted: "*You know we use creativity every day in our life. We had an exhibition at McNeil explaining the different levels of creativity: the mini-c, little-c, pro-c, and the big-C creativity."*

Creativity evolves by developing the capability to solve new or complex problems a little bit each day. People use different levels of creativity depending on their needs, which could appear in their activity or work, as Participant B mentioned:

> *I think that there's an opportunity for creativity in all aspects of life and I think it's something that you can be. You can hone and develop it over time, it is just like any skill just practice right.... You know, they're complex problems that are analytical and can still help creative solutions.*

Professionals and educators working in the field of design as architects or graphic designers play a role in inspiring and enhancing their students' or clients' creative thinking.

Creativity is one of the ways of developing students not only in school, but also in the future.

Participant A said, "*You know, creativity is a part of me personally, at home and my day-to-day life, it's very much about self-expression…. Yeah. Oh, it's, it's about how I arranged things, the kind of textures I use in my work."*

According to the participants, creative instructors must have specific attributes in order to foster students' creativity in the classroom. Participants discussed several important characteristics and factors that they possess as creative instructors while teaching. Various characteristics of teachers were addressed such as: being motivated and

enthusiastic, being flexible, open-minded, and having empathy. Moreover, participants discussed other factors they consider and sustain in their learning environment includes: sharing experience and knowledge, creating a supportive climate for discussing ideas, and considering equity and social justice.

Participants explained that motivations, enthusiasm, and encouragement are characteristics that promote students' creativity, and stimulate their learning and exploring.

For example, Participants E shared:*" In my classes, I do encourage creativity and promote it through enthusiasm."*

Encouraging students through the learning process and using positive reinforcement is more likely to impact their creativity, as Participants K noted: *"As an instructor, I assign things like projects …. and I encourage them through the process, which helps them to grow their own creative practice.*" Participants I also agree positive language empowers students learning:

> *I also encourage them when they do sketching hand sketches...I try to reward and reinforce their work all along... I will say you made a good effort and you tried your best, even though it may not be as good as somebody else's.*

Participant H found using encouragement and enthusiasm helps students focus on the task assigned to them:

> *I had a student in a studio class in the spring. He was one of the most challenging in that class, but he did fabulous work. It was really interesting, but so he was like off on this creative thing. I really want him to learn this skill but you know with enthusiasm, so one day in the class I said wow, what you did is really awesome. I want you to share it with the studio, but I also want you to do this* [the assignment]*, so what can you do in 45 minutes?*

The instructors above both motivate the students and offer flexibility. All participants agreed on the importance of flexibility in teaching; however, they looked at it from different angles. Participant G stated, *"I like the word flexible thinking, because it is related to the word creativity."* Participant D stated flexibility is important when teachers teach students critical thinking and problem-solving: *"It's very important to have flexibility when you are teaching especially creative problem-solving."* Teachers' flexibility of thinking allows educators to be open to all the situations of learners' abilities. Participant G noted: *"I think, flexible thinking allows us to allow different options also, allows us to look at things differently."*

In addition, Participant G explained that educators have to consider being flexible and responsive to individual students' needs: *"I think as a creative instructor, you have to balance that, their needs with you know the ability to be flexible and to pivot when necessary."*

Moreover, being a creative instructor means to be flexible with all the students' unknown discoveries and results. Participant H said: *"I think one of the things that being a creative instructor also would be acceptance of a lot of ambiguity and flexibility."*

Sometimes teachers have to be flexible and keep their expectations in a positive direction, because doing the opposite could impact students' creativity. Participants A provides and illustrated account of classroom flexibility:

> *The classroom has had to become more flexible and so I'm trying to keep my expectations in a pretty empathetic zone to kind of celebrate what they do. I think, at times, I've always been very blunt, you know, in reviews, but I realized that is not helpful. So now I've been really trying to pull away from that because I don't want to stifle anybody's creativity.*

In order to be flexible, participants noted they should be open-minded. Participants revealed being an open-minded teacher means the willingness to consider students' ideas, and sometimes try different teaching strategies or exercises in the classroom, Participant B commented:

> *Creativity means to me coming to the table with an open mind about possible solutions to whatever you're trying to solve. So, I'm always open to the fact that there are constantly new ways to solve the same problem. And yes, you might be rooted in a certain way of approaching something that you're very familiar with…. I kind of liken it to the openness...You know, like, be open to thinking of new ideas or what out there…. I need to be open and be okay shifting things that students work on specially with their experimentations.*

Participant H had a similar thought by being open-minded means having the ability to acknowledge other perspectives to hear students' voices:

> *As a teacher when I frame an exercise it's important to try to be open to let students bring their own creativity, and as a teacher, I think that's a lot of what we do is to try to let students find their own voice, even though we're more like a conductor or choreographer.*

Participant k added being open-minded is also accepting students' resistance*: "You have to be open to the feedback and the pushback."*

Empathy helps teachers to be open-minded and to understand what's driving students to certain behavior and find methods to help, and thus teaching with empathy was discussed by multiple participants. Participant F declares: *"I think it's important to keep an empathetic outlook for students' needs."*

Being an empathetic teacher means being able to connect, support, and set appropriate guidelines with students. The benefits of empathy in education include building a positive classroom, but at the same time instructors must consider pushing students to a higher

level of learning, Participant E explained: *"Do I have empathy for my students? I have empathy, but at the same time I'm hardcore and my bar is always up high."*

Participant A asserted it is important to understand students think differently, and teachers should consider all the aspects and support their learning differences. Teaching empathetically, promotes students' creativity and ability to succeed, especially in stressful moments. Participant A stated,

> *Education-based on you know models of how design is taught and how it can expand based on technology, but, you know, the truth is you have to be at least a bit of a psychiatrist and have a real temperament of empathy. Because I think students are not performing necessarily as they might. I mean, there's always going to be students that are doing really, you know, great work and others that are struggling for all kinds of reasons. so I want to really foster their belief in themselves and their abilities based on their precepts… I'm trying to keep my expectations in a pretty empathetic zone to kind of celebrate what they do….so I don't stifle their creativity.*

As Participant A suggested increasing empathy is needed in certain situations and crises like the COVID pandemic. Several participants revealed they sustain other teaching methods in the learning environment. Participant K pointed out there are several strategies can be used to enhance students' learning and creativity thinking by doing something unexpected, bringing curiosity, sharing a sense of humor, storytelling, and provocative questions:

> *I often used different methods with my students either using small ways or big ways.*
> *To increase creativity is the introduction of nonsense so if you have something that is humorous or different or provocative or something unexpected…. Or in the middle of my class, I say oh, by the way I was in that place and telling a story…. I can bring my curiosity and willingness and you know, it just takes their mind a little bit away from what they were doing.*

Participants believed creating a supportive and understanding learning environment promotes students' creativity. Participants F pointed out building a positive environment allows mistakes and hearing ideas is substantial, "*There's no simple three-step solution to being creative, but you know building an environment where students are free to feel like they can make mistakes, I think that's important".* Participants B explained being supportive should be during, and after the process of building ideas:

> *I ask students to walk me through where they are, how they are approaching these ideas, and so they'll give me their deal and I'll try to pick up the little kind of nuggets that maybe feel like something that they can take and build on that they may be just aren't getting that as much attention. I try to repeat back like okay well I'm hearing. You're saying this, and what I see is like this is a really interesting nugget that you've just given me, and like I see how that's starting to come out, you know, getting them to talk and have a conversation about their thoughts.*

Participant I noted teachers can create an effective and supportive climate by evaluating students' new ideas and encouraging their practices:

> *I always try to be careful and don't just judge how good their ideas are... I tell them I want you to work on your ideas more than I want to work on your presentation. Because if you just say I want to get to a set where something looks really good you'll stop thinking earlier. I usually tell them to produce ideas and just keep trying to create and think, explore options and then be able to say, you know, show that whole process along.*

The Significance of Fostering Creativity in the Classroom

Finding 2: Design instructors believe that creativity is required in the design field and enhancing students' creativity is important in the classroom.

All the participants in this study believe creativity and enhancing students' creativity is important in the classroom. All design fields require creativity because it is evolving and serving humanity, as Participant C commented: *"As a graphic designer, or*

a landscape architect, or furniture designer, or whatever, fostering and teaching creativity is important... and students have to sense that, because it is serving mankind." Participant F noted it is important for instructors to offer a climate that cultivates and supports creativity: *"It's really important and it's incumbent upon the instructor to provide an environment where students can foster their creativity."*

Most of the participants shared their thoughts about the importance and benefits of creativity learning and teaching. Creativity is significant in the design curriculum because all design domains are developing and changing every day. Besides, the demands of creativity appear not only in students' assignments and classwork, but also after graduation in their future and working careers. Participant D shared: *"Well, design is a growing field you know, there's a growing number of different things that you can do with it, or different jobs you can do, there's a lot of overlap with some you know across jobs that require creativity, so I think as a creative person, you always should be thinking about creativity is significant in design curriculum."*

This emphasis on the impact and value of enhancing students' creativity for the future was echoed by other participants, who explained creativity is important for cultivating students' perspectives, and skills for their future working careers.

Instructors indicated teaching creativity develops students' ability to express themselves and enhance their personal development. Teaching creativity gives students' a chance to express their unique ideas, and reveal their creative thoughts, as Participant E shared: *"Creativity gives students expression and helps them to put themselves into their work .... to be authentic and real."* Moreover, cultivating creativity allows students to express their true voice as designers. Participant H noted, *"I would use the word-finding*

your own voice as a designer, and I think that is tied into what you're trying to get at with creativity."

Fostering creativity impacts students' performance and leads them to reveal their creative thoughts. Enhancing creativity also influences openness to the learning experience and idea-generating. Participant D shared:

> *fostering creativity in the classroom can bring students their own unique creative perspective to assignments…. also, fostering creativity in the classroom helps students build openness to always be thinking of the next idea...give them a broad base and wide range of information.*

Another participant declared that there is a necessity for fostering creativity in the classroom. Applying creativity in design classes provides the new generation of students an opportunity for evolving their skills such as openness to experience, expanding ideas, and solving problems. Participant I revealed,

> *Students need this kind of skill (fostering creativity) to know how to think about solving problems and coming with solutions, especially with the new generation, when you have no limitation and their mind is a little bit of a young age…. Well, in my perspective, you can have this openness going beyond the rules and going beyond ideas... This is the time in their education to do that. Just let the boundaries fade away for a while.*

Creativity reinforces and connects what students learn beyond lessons and acquisition of knowledge.

Another important aspect of fostering creativity is to motivate students' passion in a meaningful way. Participant A commented, *"We want to keep students in the field, I want to keep them stimulated, so it's passionate. I mean, the teaching creativity is passionate, the kind of celebration of individual creativity has to be passionate too."* This participant emphasizes celebrating each student's creativity because creativity fuels the passion that students need to succeed in the design field.

Finding 2 A: Creativity improve students learning skills and critical thinking

Many participants indicated enhancing creativity improves students' learning skills. One of the evolving skills that students could develop from enhancing creativity is improving critical thinking. Participants explained critical thinking is a part of creativity and one of the significant aspects that instructors must seek in their teaching, as Participant H responded: *"Critical thinking is a big part of creativity because if you aren't questioning what you're seeing, then you're accepting things around you without challenging them and therefore you're restricting your own ability to be creative."* Involving critical thinking in teaching could be as simple as incorporating discussion according to Participant H: "*Fostering creativity leads to critical thinking and one of those things that you would as an instructor try to make sure that you build into them, to the literature and even just discussions in the classroom."* Moreover, Participant H explained fostering creativity improves students' flexible thinking and offers opportunities for expanding design options: "*When I think about fostering creativity, I think of flexible thinking …. I think creativity allows students to have more flexible thinking and different options, also allows them to look at things differently."* This indicates being critical leads to being flexible and vice versa.

One of the methods that were explained by Participant I to improve critical thinking is classroom applications, such as activities and assignments, which leads to creativity. Participant I stated,

> *Students need to think about things from all different points of view and perspectives, not just what the instructor told them or what they read in the textbook. I think if they apply the knowledge in another way it will really help them learn it…. thinking about how they apply it is where some of that creativity comes in and I think it's more important for them to learn that.*

Participant I offered insight into how instructors could promote creativity more through exercises that apply the knowledge in different ways and explore other perspectives. These themes will show up in the coming sections.

Finding 2 B: Creativity influences students future and working career

Participants emphasized each profession has certain required or desired knowledge to students' success after graduation. In the interviews, participants discussed the value of fostering creativity in the classroom and how it prepares students for their future jobs and clients. Fostering creativity in the classroom trains them to take what they learn beyond the class, raises their academic and social-emotional success, improves their communication on how to present ideas, and gives them more confidence, persuasion, and passion.

Practicing and enhancing creativity allows students to take their creative skills and knowledge to daily life and professional activities, as Participant G revealed: *"If you're introducing and giving opportunities to practice creative skills then you can take that into your professional life or job and sometimes even your personal life."* This comment emphasized that the classroom could be the first place where creativity would be encouraged and nurtured.

Participant D explained teachers' creativity practices within the classrooms could impact student academic and social-emotional success. Enhancing creativity increases students' self-confidence and their beliefs with their own abilities, which is one of the important behavioral skills that is required at the workplace. Classroom experience and instructors' actions or environment foster students' resilience and self-confidence.

Participant D note that self-confidence encourages students to take risks and to resolve problems or questions, which contributes to their future personal and professional success.

> *Being a creative person helps them to feel confident about their own decision-making. I think it helps to give them tools to address problems or questions on their own, where they know outside of the classroom. We don't live all our lives in the classroom, but we hope that classroom experience provides students with knowledge and skills that can be applied to encounters or in their professional life or in their personal life, even that can benefit them there, so I think it's important to foster creativity in the classroom because it fosters confidence.*

Participant D also commented enhancing students' creativity improves students' communication and ideas generation: "*So creativity can really enhance students' communication…. fostering creativity in the classroom helps build openness to always be thinking of the next idea."* Several participants talked about generating and presenting ideas as fundamental behavioral skills for students' career success. Participant D emphasized that many jobs require creativity. In order to be in the creativity zone and to generate ideas, several actions should be taken. This participant suggested three ways to generate creative thoughts such as: thinking about habits that cultivate ideas, working on an ongoing project, and keeping ideas in a notebook.

> *There's a growing number of different things that you can do with it (creativity). There's a lot of overlap with some you know across jobs that require creativity. So, I think as a creative person, you always should be thinking about ways to enhance creative ideas, even while you're doing something else. You know how people always say, well, I woke up and I had this amazing idea, that it's true. You should always have a project to work on, and a book for running a list of ideas.*

Participant E discussed how creative persuasion and passion are behavioral skills accrue from creativity without students need to practice it in the classroom. The participants believed persuasion is a required skill and essential for life.

Regardless of the product and industry, every job requires the power of persuasion, and this skill is fueled by creativity training. Moreover, the participant declared that passion is a significant aspect of cultivating creativity, because without it there is no determination or motivation for innovation. Participant E said,

> *I tell my students' creativity is important, it's going to be needed in real life for, you know, how do you catch someone's attention through the chaos, it's going to be needed for persuasion, if you're taking someone through to sell them an idea or concept or product or service anything you're going to need creativity to do so…..Fostering creativity helps them be more passionate about what they're doing...I even think about times when my assignments must have a creative element to it. The ones that they'll remember in 10 years, more than, you know, some boring case study.*

The importance of future workplace creative skills was also emphasized by Participant A, who stated:

> *You know, we're in the design profession so I remind them often that they're going to go into jobs where the client will dictate and on one hand, the client is going to be your boss to some degree.... so, they're going to find ways to meet their creative expectation.*

Thus, meeting clients' creative expectations is another behavioral skill that is the desired attitude for work.

Activities that Enhance Students' Creativity

Finding 3: There are several activities and practices that design instructors apply in their classroom teaching to foster students' creativity, besides, they use multiple approaches to develop and evaluate the effectiveness of these practices.

The interviewed instructors explained several activities that foster students' creativity. These exercises are utilized either inside or outside the classroom. All the

exercises are developed by the instructors focus on two aspects: First, stimulating students' creative thinking and behaviors. Second, enhancing students' understanding of creative people and their creative process. Most of the creative exercises concentrate on specific thinking or behavior skills, and have main objectives. Sometimes these exercises are for training purposes, and could be spontaneous based on the students' interactions and attention in the classroom.

Participants explained several activities that enhance students' creative thinking and behaviors including discussions and presentations, asking questions, exploring and experimenting, reading and writing, critiquing, brainstorming and feedback sessions, using multimedia platforms, community building, humor and games, and asking questions.

Open discussion is one of the major class activities all participants talked about. All the participants agreed classroom discussions stimulate creative thinking. Class conversations often engage students in discussions, problem-solving, and higher-order thinking, as Participant E shared: *"You know, getting them to talk and have a continuous conversation by asking questions, it makes them engaged in class sessions in all thinking levels."* Participant B also explained group discussions allow students to exchange their experiences and expand their thoughts by hearing other perspectives:

> *Sometimes I substitute lectures with group discussions, so students assigned to do different topics and present them, and we have conversations about these topics, and I just sort of facilitating the conversation...We also share our experience from the readings and trips when we come back we talk about the experience...I found this process allows students sharing what they came to understand more deeply.*

Applying active teaching strategies, such as small group discussions and large group discussions interactions, often pushes students from their comfort zone and boosts their creative thinking, as Participant J shared:

> *But instead of doing a formal full lecture, sometimes I do small group discussion and large group discussion. They read the chapter, I have the PowerPoint slides and usually, I'll lecture from that for a few minutes, and then they start the group discussion...I break them into groups and they each take one of the questions or discussion questions that are at the end of the chapter. They will have to talk about it and report it back to the class. So, kind of they have to read on their own to show their understanding by what they're reporting and then each group has a different question...I think this is one way to deal with creative thinking in the class with the students. It kind of pushes them to bring the best to the table, and to push them out of their comfort zone.*

Participant I found that group discussions and presentations motivate students to share their ideas, improve their presentation skills, and build their confidence:

> *I found that class discussion works very really well, because I'm getting everybody's a little different perspective and just getting them used to talking. It was hard to get them to do that. So, between now and then, what I do too is I work a lot on helping them learn how to present; it gives them confidence.*

Researching and presentations broaden students' diverse knowledge, allows them to make more interconnections, improves their critical thinking skills and creative thoughts. Participant J commented,

> *I have an exercise called retail buzz, so a student has to be a different volunteer each class [and] has to research current events happening in retail and report it to the group. So, students go research a current event or just look at articles and read it and then they come with the facts and they have to talk about what the article said, what they learned, you know, do they agree with it, and then ask the class for any input on what they talked about...I think this activity makes them analyze what's around them and develop critical thinking skills.*

Besides presentations, asking questions and establishing dialogues between the

instructor and students extend students' thinking, as Participant C said*: "I try always to get the students to think very broadly and just rethink through questions."* Moreover, Participant B asserted that using questioning techniques is important, because it allows students to activate their thinking and promote critical thinking: *"I try to ask them very leading questions and have them try to get them to think deeply like what? and why? mostly when they are presenting problem-solving or decision-making."*

Participants acknowledge that explorations and experimentations are powerful ways to build creative minds. Embracing experimentations frees the creative mind from rules, familiar paths, and expectations and opens the portals of authentic expression, as Participant D observed:

> *There is an exercise we call it 16 views. Students take one object and they render it 16 times in different ways and experiment it with different media. It can be like collage or three-dimensional, as well as, you know, two dimensional. The stuff that they come up with can surprise you. If you crave creative growth, embrace experimentation.*

Participant J noted that exploration and experimentation could occur in different ways, through researching, analyzing, and applying their knowledge in their projects:

> *I teach them to think about all the different ways and influences them to look at not just the textbook. So that's the answer. How do they do some research or look at other industries to see how they're tackling it and then apply it to what they're doing. So I think I'm encouraging them exploring and experimenting and looking beyond the textbook and the lecture and what they know.*

Participant K found that when instructors encourage students to explore and experiment, the more new ideas emerge in their work: "*I always push my students to keep experimenting with things...Change scale, change repetition, change proximity, change spatial relationships, change hierarchy...You know, in that act of changing and exploring, their (students) creativity grows, and develop and new ideas appear."*

According to Participant D reading is significant to creativity. Moreover, student's knowledge can build-up and expand by writing: *"I often like them [students] to do some writing, because I think writing is important in order to build knowledge and creativity."* Participant I discovered reading and writing contribute to the empowerment of students' creative thinking skills:

> *I used to have them [students] do some research, or read an article, or watch a video, that fed into what they were doing, and then write a little summary to make sure that they did it. This time I have them do a verbal two to three minutes' summary. It seems to work well, because surprisingly students are sharing different ideas from the same content.*

More structured and stimulatory activities—such as critiques, feedback, and brainstorming—may also enhance creativity through sharing and exchanging different viewpoints and experiences. Effective feedback helps students to hone their skills, produce more creative work, and achieve content objectives that instructors want students to have, as Participant I noted: "*I really encourage students to work with each other and give each other feedback. And I always do pinups of the progress of the work without saying, Oh, you're behind… it improves their thinking and working progress."* Participant B confirmed feedback builds up students' work; however, with direct feedback and conversations that boost creativity, leading to stronger ideas and better outcomes:

> *I do a lot of peer feedback, and direct feedback...I'll ask them to walk me through their work...That usually helps them to take and build on... especially when they are less engaged...I've got students who are really engaged and seek that out and you know they come and we have really great conversations, and their work improves so much better.*

Participant F found smaller group feedback and critique is more beneficial for students than whole-class critique:

> *I think smaller groups' critiques work much better, and sometimes I would just meet with each group while the other groups work on their projects...I think that helps them to increase their productivity and encourages all the group to have a say in the discussion.*

Besides critiques and feedback, asking the student to reflect is another approach that could enhance their development of creativity, through focusing on objectives, as Participant F states:

> *We do something that's more evaluative...it is like a reflection...I really try always to have a student know what their strengths are, what to build on, what to let go of, what are their intentions...It really narrows their thoughts and increases their intentions.*

Brainstorming was mentioned by the participants as a method for ideas generation, and to trigger creative thinking, and problem-solving skills, as Participant G explained:

> *When I'm teaching my regular classes. We do a lot of brainstorming. We do a lot of small group work, you break up into different kinds of groups. We've got some ways of kind of rubrics to look at and kind of as a starting point…. It helps them kind of see things from a different perspective and improves their critical thinking and problem-solving skills.*

Participants reveal engaging students through media platforms—such as videos, written text, word cloud generators, and other programs—in the classroom motivates and supports student learning. Appropriate media teaching strategies can lead to creative learning and product development, as Participant B states: *"There are creative ways people are already used in teaching in the world like videos and online materials, which goes into making it the most successful and supportive tools for the students."* Participant B notes that sharing videos is an ideal teaching strategy to enhance students' learning and it is comparable to bringing professionals' experience to the class*: "Sometimes I share*

YouTube videos, and I also provide links to professional sites… it is like bringing real-world experiences into your classroom."

Utilizing word cloud generators increases students interactive experience in the classroom, as Participant E observed:

> *I use the word cloud generator in class activities. So, they would have their phone, and I'd say, all right, you know, tell me your favorite retailer and they type it into the phone and I'd see a word cloud of all the retailers and I could respond to it and talk elaborate… it helps students to really interact.*

Participants imply bringing snacks and treats to the class building the class community, brings students together, and has a positive impact on classroom culture, as Participant E said:

> *I brought food to class, but only on study days before a quiz...I normally have a candy jar at my desk...my students like it...I have Smarties there, because I think they're delicious...I also host a book club and bring cookies.*

Participants G said bringing snacks helps students to pay attention and focus on tasks in the classroom throughout the day:

> *When we have a workshop one rule about it is always having good snacks. Because if people have good snacks, then they're more likely to think rather than if you don't know or think about the content of the workshop...and if you've got no snacks or bad snacks that all people are thinking about, I'm hungry or this is awful.*

In addition to treats, playing games and competitions in the classroom increases class cooperation and community relations. Classroom games can be used as team-building exercises, and teach students leader behaviors like courage, respect, thinking skills, and tenacity. Participants E explains varied of these exercises:

> *The creativity piece of the class is like how I do an icebreaker. like this week we're doing ethics, and start the class with an exercise that teaches ladder behavior skills. They do what I do, not what they listen... Last semester I did*

> *a competition, a theme for the Zoom background, like everybody has to put a color and we will see what we get, it was somewhat funny…. I'll be like, watch this movie on your own. It's not an assignment, it's just so that we all can have something in common...One year in class for Halloween we had a costume contest.*

Participant J shares introducing games in the class is an excellent way to boosts student engagement:

> *One year we had an ugly Christmas sweater contest and students wore ugly Christmas sweaters. So trying to do that was in the big lecture class, you know, so trying to interject some fun into the class and not just kind of that straight lecture. Students were creatively engaged and came up with interesting sweaters ideas.*

Besides games Participant K observed introducing humor and nonsense spark students' creativity:

> *One element to increase creativity is the introduction of nonsense like you have something that is humorous, or different or provocative, or something unexpected...Distracts people when they come back to their creative work. You might see something consciously and apply it or it's just part of the subconscious just a diversion from what they were doing. Other times, I'll do more kinds of nonsensical interventions. I mean, I've played music and dance in class for my students while wearing sunglasses and a party hat, you know, I mean, I'll do things that are just goofy.*

All the above activities focus on stimulating students' creative thinking and behaviors. According to the participants, students benefit from these activities and gaining successful learning experiences, either it is occurring inside and outside the classroom.

Participants revealed there are several exercises that enhance students' understanding of creative people and their process. These activities include field trips, and creating exercises that stimulate the teaching content and subject matters. The most

common themes participants shared were bringing guest speakers to the class and showing examples to students.

According to the majority of the participants, guest speakers support student learning and inspire student's creativity. Guest speakers represent real models motivating students and stimulate their imagination, as Participant B explained:

> *The last time I taught this course I had brought in a bunch of industry people professionals and I put them in small groups with students and they had to present their kind of two concepts...You know, an industry person wasn't me and wasn't another instructor. That was such a beneficial exercise for everyone involved, and I think it really made them think, because all of us industry people said the exact same thing that I was saying. But you need, you know, just magic when it's not your instructors.*

Participant F asserts bringing professionals from the field piques students interest in the subject matter and links what they learn in the class with the industry, saying: "*I bring other people in the class and I like to bring people because they connect with students and they can relate the content with their work, and help enhance their classroom learning with real world experiences."*

Participant I comment professionals' contributions in the class benefits students' development and creativity because they bring their insightful skills and experiences that cannot be taught sometimes by the instructors, as explained:

> *I've always brought professionals in of some kind. Those are really valuable, especially in final project presentations. They just bring insight and particularly when you get it nto areas where maybe my depth of knowledge isn't so great, but to show them you tap into that*

Participant F state that including professionals guides students in their learning journey and allows them to consider their options such as majors, career, and needed skills:

> *I do more like breakout rooms conversations and you know having guest speakers for 10 or 15 minutes, like we had Career Services, and Kohl's who is a big recruiter on campus... They came and talked for 15 minutes explaining career paths and important skills needed in the field. I think it was helpful for students to consider their majors, career, and the important skills to pursue while in college.*

Incorporating real examples and approaches into the classroom experience enables students with unique perspectives. Another teaching strategy discussed by many participants is combining real examples of creative people's work in the learning process. Welcoming other ideas and voices into class exposes students to other perspectives and shows a variety of solution options. Displaying a professor's projects or the work other professionals demonstrates that learning is a process of ideas implementations, adjustments, and pleasing outcomes. Besides showing examples might inspire students and lead them to critical thinking, raising questions, debating, and discussions, as Participant K explained:

> *I show students examples of some commercial work, and some personal work...It helps the students to see real examples, also to get to know their professors, and proof of the value and effectiveness of the class activities and practices... I think it is a great way to inspire students...It creates discussion and that's what is education...It opens a forum that allows for dissent and divergent opinions, debate, and critical thinking.*

Participant B agreed with Participant K illustrating examples from students' surroundings improve their critical thinking and skills, saying:

> *In my identity class, I always bring a collection of business cards and packages I use in my daily life...I think this is the first step to be critical. When you see examples, and start observing all the things around you like cereal packaging, magazines, commercial work, it helps you to be a critical thinker and to be a good designer…. I bring those and layout every single week and use them to explain to students, so students look at something real and tangible they can touch it.*

Participant F states live demos also improve students' educational effectiveness because, it allows instructors to go into details and connect in a clear way with what the students need to know on the content, as declared:

> *I'm kind of relying on showing real examples and live demos in the class because I can show steps, and details for very specific things which I think it's a great way to explain techniques in depth.*

The discussion about creative exercises involved field trips beneficial effects. Most of the participants take their students to field trips, including museums, and organizations. Participant F explained that field trips developed students' knowledge, supports teachers' class objectives and implementation of the curriculum: *"We take a field trip to the Anderson Library and look through the children's literature collection. It helps students to look at the process of creating books for children."* The activities which might occur by students which include observations, interpretations, reflections, or working on projects during or after the field trips could encourage their flexible thinking to be open-minded for different solutions.

Participants revealed that field trips also had a positive impact on students' creativity, critical thinking, practices, and interest in class subjects. Participants D noted that field trips inspired students' work, support class activities, and provide opportunities for live practice and analysis:

> *On field trips, we go to different places to draw. Once we went to the Como Zoo, it was inspiring for students' final projects. We've been to the Raptor Center to draw the birds and the Bell Museum. Before COVID we would go to the bowling alley and the Students Center to draw body gestures. Observing people there helped them (students) to analyze and practice. They had to draw gestures focusing on movement, and capturing motions.*

There are more benefits of field trips provide which cannot readily find in traditional classroom settings, as Participant G explained:

> *We visited different exhibitions. It is interesting to see how artists overcome challenges and foster creativity. Sometimes it's a matter of introducing ideas, and then going back to those ideas and asking them to re-apply in their work. Which gives them an opportunity to share their flexible thinking and to understand that there's no one way of doing things.*

Excursions are one activity might inspire students thinking. Instructors may utilize diverse activities in the classroom to enhance creative ideas. Ultimately these activities are different from one instructor to another and vary between class types and subjects. According to the participants, all the activities mentioned were stimulatory techniques, which encourages students' creativity.

Inventing creative exercises

According to the participants, the majority of their creative activities in the classroom are a combination of several aspects. All the participants revealed most of their creative exercises are based on their past experiences as students, or teaching expertise, or working practices.

Most of the participants acknowledge that their creative exercises derive from their educational background. Participant F explained most of the exercises that are demonstrated in the classroom are based on teaching as instructors and educational background in grad school. Participant F stated: *"All my exercises are mostly based on my teaching experience and when I was a grad student…also, I rely on my experience more now, and I share ideas back and forth about what's working and what's not working."*

Moreover, almost all the participants declared the creative activities were based on their teaching expertise, whether it is related to their own performance in the class or from other instructors' experiences who are teaching in the same college. Participant I concluded the journey of learning, teaching, and working experiences shaped their development of creative exercises: Participant I responded, *"My activities, I think they're more based on my experience going through college, and working at design school and then working in teams at one point."*

Like Participant I half of the participants revealed their creative activities were also based on their working experience in the field.

The majority of the participants noted the interaction with colleagues, mentors, peers, and students is another way to get inspired to develop creative exercises. Participant B explained conversation with instructors in the same domain encouraged their building of effective creative exercises: *"Sometimes I just get ideas from instructors on what's working and what do students get excited about and engaged in."* Participant E also shared,

> *My exercises are kind of all over the place. You know, we all have a network of other people like peer mentors, some of it through just swapping ideas with teachers at conferences and stuff like that… some were pretty solely based on my kind of work experience and how my design teams' kind of run and how we approach projects.*

Participant E shared how some of the implemented creative activities are improved by students sharing their ideas and feedback. Participant E commented, "*Also, some of it [their development of creative activities] is our students being awesome with feedback and giving me ideas."*

One of the beneficial methods for building creative exercises, discussed by participants, is relying on design and teaching books. According to Participant B, each activity has a specific goal and purpose, and using books such as educational resources intensifies the teaching objective of the exercise. Participant B added,

> *I've amassed a larger collection of books in teaching and design, so I've pulled exercises out from those that kind of spell out or you know like have a specific purpose of the specific goal of what we're trying to teach, I personally like the bigger picture and so having those aids to break it down a little bit more has been helpful.*

Although these participants draw upon many resources to develop creative exercises, the ideal exercises are the ones resonate with and engage students.

Exercises Evaluation

The interviewees in this study claimed they use different methods to evaluate the effectiveness of the creative exercises implemented in their teaching. This includes: students' evaluation for instructor's performance in the classroom, and instructors' assessment for students' reactions and attitude toward class activities.

Instructors revealed they rely on students' evaluations, self-reflections, and debriefs to evaluate and build their creative exercises. Almost all the participants confirmed using the annual evaluations is a perfect indicator for assessing the creativity activities' quality. Some instructors explained they design their own students' evaluation, and in some cases asking questions about certain exercises. Participant I shared,

> *I had my own form, I would do two things that are important to me to try to learn how to teach better and how to be effective and I did that for about three years, and then, it seemed like I was getting enough feedback.*

Participant H revealed asking students to write reflections and debriefs allows the instructors to understand how they can support students' learning through assignments.

> *I do something that's more evaluative like reflections and more feedback, and sometimes small group reviews...I do debrief as a group and I use it a lot of times to understand patterns and ideas that would help them in their assignments.*

Participant G declared the annual Student Evaluation of Teaching benefits instructors in understanding the effectiveness of their teaching activities, and helps them to prepare for future classes. Participant G pointed out, *"I always look at the student evaluations and read them… I also think about how I can improve the past."*

In addition to listening to students, other participants revealed they do self-evaluation and question themselves when they evaluate their classroom activities, as Participant G shared:

> *I always question myself if this [activity] is working for this class or should be modified? What I'm saying or what I do, or how it's deliberate to students and more effective...Did this work for the students, or are there some things that I could do better to reach them?*

Another method was mentioned by the instructors for activity assessment is observing students' reactions and attitudes regarding the creativity exercises. Participant B noted, *"I look at student's reactions on what's working and what students get excited about and engaged by."* Students' responses and attitudes provide instructors with valuable insights into students' learning experiences. Participant E illustrated the most frequent assessments saying:

> *The real feedback is watching energy in the class... I offer a feedback survey after the fourth week of every class so that they have to tell me what they like and don't like so I do more of it or less of it...Sometimes I assess assignments through just word of mouth… or I could see my students becoming more passionate towards some activities.*

Observing students in the classroom environment and students' responses to the instructor's demeanor is also an indicator for assessment. Participant K shared,

> *I do a lot of things intuitively. I look at a class as a social environment and so I make a lot of judgments and adaptations based on the group, the dynamic, or people laughing at my jokes if they are, okay good, more.*

Multiple forms of assessments and being attentive to students' responses in the classroom is an essential part of the practices of teaching creativity.

Factors Influencing Classroom Creativity Practices

Finding 4: There are several factors that influence creativity in classroom practices.

When instructors discuss the factors influence teaching creativity, they primarily talk about the challenges that impact their classroom teaching and their students' creativity. These challenges occur at different levels: the educational organization (school), classrooms, students, and beyond school. When describing these challenges, participants looked for ways that such influences could be adjusted and improved. Participant G revealed teaching creativity is substantial, it is a challenging task to apply by instructors, saying, *"I believe fostering creativity is important and one of the things that we are challenged to do as instructors."*

The factors appeared from the data are summarized in Table 5.

Themes	Mentioned	Participants
Factors related to school	15	11
amount of work	2	4
grading and curriculum	4	6
resources	7	11

software and books	2	3
Factors related to classroom	16	11
classroom environment	5	6
space	11	11
Factors related to students	34	11
family support	2	2
lifestyle and stress	4	7
mental illness	3	4
motivation	2	2
personality	6	8
skills	3	3
student attitude	4	8
student performance	1	1
students background	5	6
students learning styles	2	2
time management	2	2
Other factors	17	11
economic changes	2	2
gender changes	3	3
online learning	8	10
political affiliation	1	3
technology	3	4

Table 5. Overview of Data Analysis for the Factors Influencing Classroom Creativity Practices

According to participants one of the main difficulties facing educators who want to nurture creativity is the educational organization (school). Half of the participants discussed several topics related to the school's impact on teachers' creativity practices such as: the required amount of students' workload required by the school, resources, grading, and curriculum.

Participants argued design schools allow students to take several courses that are project-based at the same time, which increases students' workload and makes them exhausted, and prevents their creativity. Participant B said:

> *In the design school, students are taking multiple classes that are project-based and have time constraints. It's very hard to fake creativity if you're exhausted, or you're not feeling inspired like this time period. I experienced that all the time with just deadlines like: I am not in the headspace to work on this. I'm feeling drained. I'm feeling whatever, and it's a drag and it's no longer fun to work.*

Participant H explained the volume of work students face in undergraduate programs and how it's challenging, especially when students are taking a large, or overwhelming, a number of credits, stating:

> *The overwhelming amount of work students are doing in our programs is so challenging and there are so many things that students are trying to emulate. In our undergraduate programs students are taking 18 up to 20 credits...I think it is overwhelming honestly.*

Students often take on an overwhelming course load in order to finish their program in four years instead of five to save money.

Participant F also acknowledges how the high cost of design materials impacts students' productivity because many cannot afford the needed materials. Participant F shared, *"Sometimes I just share my own materials because some students can't afford it and that part might affect some students' creativity."*

Almost all the participants complained about school resources and how it impacts students' and instructors' creativity performance. Participant D talked about the importance of providing specific materials in specific classes especially in drawing, because they are costly and could hinder students' creativity exploration, noted: *"In drawing classes, it's very important to have materials available for students to use as*

part of their supplies for creative explorations, because some of them are too expensive to buy, but honestly, our college just doesn't have money." Participant H also said some software is costly and not all students can afford it, and some schools can't provide students licenses, adding, *"Some students can't afford software because they are so expensive, and I think that is a problem that some programs should consider."*

Half of the participants claimed there is a shortage of school funds for classroom supplies, and many instructors feel that lack of resources constrains their teaching and students' work productions. Participant E discussed several issues with resource limitation and how those impact students' work quality and their emotions, saying: *"In my class, we did a big project for Macy's, we were so excited... we ended up displaying the work in the hallway, it looked kind of shitty because we had no funds, and students were so disappointed."*

Resources could also go beyond money to include having partnerships with museums and companies that could train and hire students. Making collaborations with organizations influence instructors' teaching in a positive way by increasing students' career relevance and motivation. Participant G stated, *"We do not have access to resources and by resources, I mean, partnerships with museums and organizations that provide training, internships to students, and bringing guest speakers … I think these things would influence my classroom practice."* Participant E also wished that the school would provide a lounge and a specific library of books for certain programs, such as retail, and provide a budget for guest speakers to reward them for their time.

In addition to instructors' concerns about financial constraints, participants expressed concern about the impact of grading and curriculum on students' creative

outputs and instructors' teaching. According to participants, grades can sometimes restrain students' creativity. Participant D reported some students focus too much on what grading requirements they need to meet with the curriculum and ignore creativity, which prevents students' learning and creative thinking, saying: *"Students worry too much about grades and getting points, which is very hard because it impedes creativity or rubrics. Now I'm trying to break down the creative process into my class rubric."*

Participants H and B claim assessing students' creativity is a complicated task that might prevent some instructors from assigning creative projects in their classes. Participant B acknowledges the tension between the flexibility of creativity and the rigidness of grading:

> *For me, it's the idea of grades. It works against creativity, I try to find ways to be as creative as possible in how to get around that...you need to read the student, but in the meantime, you're struggling with a lot of factors.*

Because evaluating creativity requires effort and considering different aspects, some instructors feel uncomfortable critiquing students' work, as Participant K shared, *"Students are kind of unwilling to be too critical."* Being critical can be complicated for students and instructors in the classroom.

Classrooms

The classroom itself was acknowledged as a second factor that affected students' creativity especially, specifically the aspects that related to space and environments. Almost all the participants discussed the fundamental aspects of creative learning environments, which include having a clean, organized, safe, well-lit, and well-equipped

environment. Moreover, the participants noted how a negative environment could influence their teaching performance and satisfaction, as Participant F observed:

> *One-semester they put me in a classroom for my illustration class and that the class was not flexible. We had to change tables constantly based on the assignments... however, the tables and chairs were huge, students could not sit in a circle around the model.... I tried several ways to change all that and it just didn't work, and you know it made an immediate impact on me as a teacher, and unfortunately, it affected the whole class because I wasn't really satisfied with that space, and I just realized that now, the environment plays a huge role in that.*

In addition to the challenge of teaching in an inflexible space, participants talked about their frustration of moving from one campus to another, teaching in a building that is not owned by their department, and being in a space designated for a different discipline. Participant J commented there is a link between students' creativity and space too, in the way they think, feel, and act:

> *Last year I taught a bio-tech class in the bio building basement, in an old science experiment room, dark, and dungy at 8:45 in the morning. There were no windows,*
> *and I saw the impact of the space on the students' mental, learning, and attitudes. Students were actually not interested in the class, they were just sitting there giving me eyes saying just take me out of here! It was really hard to motivate them and pump them up.*

All the instructors pointed out the significance of the environment and students' surroundings, and how those help educators achieve this goal. One of the challenges is teaching students in an environment is not prepared or flexible for class activities as Participant B complained:

> *I was teaching a studio design class in the social work building like we weren't even in McNeil Hall, and it was set up like a lecture. So, I was very far away from the podium and there were only rows of desks and chairs, and the class was based on group projects. Students couldn't move the desk or even form a group in that*

room to talk face to face or brainstorming. That was definitely an environmental challenge.

In addition, instructors emphasized the importance of providing a positive environment that meets students' emotional needs such as: feeling safe, confident, supportive, encouraged, motivated, and comfortable. Participant B stated instructors must create an environment where students feel comfortable and safe to express their opinion. In such a classroom environment, instructors encourage a culture of mutual respect, and self-expression. Participant B shared, "*I believe in free speech and democracy. You know, I would never say anything that makes my students uncomfortable. I try to make students comfortable and feel supported because to engage students they have to feel safe and supported."*

Students

Participants addressed several topics related to students' individual aspects impact their creativity, which includes: students background, family support, lifestyle, personality, learning styles, mental illness, skills, attitude, performance, time management, and motivation. The topics were discussed deeply by participants and were related to students' backgrounds, personalities, and lifestyles.

Half of the participants implied students' backgrounds could influence students' creativity. Participants discussed separate background themes such as: family support, student's genes, and how they influence their creativity. Participants believed parents are students' first teachers and they make a powerful difference in their learning, thinking, and confidence. Participant D noted parents' support of their students' educational journey could influence student's creativity and work progress:

> *Students' creativity could be impeded by parents. You know, some students say my parents are graphic designers and others are artists; others [say], my parents don't really understand what I do, and I have seen that really impede students' progress in the class.*

Participant A also shared a comparable opinion about how it is important parents emphasize and prioritize their children's creativity skill and encourage their learning as college students, adding:

> *Once I just said something about a student's assignment, like, wow, that is really good work you really pulled it together. She told me, nobody has ever celebrated my work like that. In fact, she said, her parents asked her why are you going to college, why are you putting yourself through that it's expensive.*

Another form of parental influence is genetic impact. Participant E referred to books about genetic influence on creativity, noting there is a science behind students' creativity, thinking, and behaviors, but those could be developed through knowledge and training: *"People are born with levels of intelligence and creativity that are related to their genetic basis. However, over time you can build on that with knowledge, experience, and then behavior skills and competencies."* The influence of genetic factors is one part of forming individuals' creativity, but other factors such as personality play a large role in shaping a person's creative ability.

Participants believed there is a relationship between creativity and students' personality, and courage is one of the important characteristics. Creativity requires courage, and both are intimately connected in a synergic relationship. Participant B declared not all students have the courage to show their creativity, revealing: *"I think fostering students' creativity is very important, and I think a lot of students are too timid*

to express that." This indicates instructors must realize not all students have the courage to share their creative process, products, and their role is to build confidence.

Participant F also emphasized students' personality to be a morning person or night owl is an aspect that influences a learning productivity, saying: *"I like to teach in the morning. That's just the time I'm ready to teach and I know that a lot of people aren't morning people. So, there's a challenge for some students there."*

In talking about the factors prevent creativity, participants discussed students' lifestyles and how it is impacting their work. Participants B unexpectedly shared how students' life demands sometimes influence their achievement. To afford college expenses many students get jobs, and juggle between assignments that require effort, which is a big commitment. As a result, students become overloaded, stressed out, and distracted. Participants B stated: *"In the design school students are taking multiple classes...and have time constraints. It's very hard to feel inspired and fake creativity if you're exhausted and working all day."* On the contrary Participant E was skeptical that some students use their heavy workloads as excuses to pass college courses with the least possible effort, revealing:

> *Sometimes our students make up excuses to work less. I have empathy for college student's lives, but at the same point, I don't trust them. I know it's hard to study and work but I worked during college and I got a 3.9 average GPA.*

While, students' lifestyle is one factor that was noticed by participants influencing students' creativity; however, there are other factors beyond students' life that have a similar impact and can occur inside the classroom or outside.

Beyond School Factors

Participants observed other different types of factors (or reasons) that are beyond school and have a negative effect on students' learning and creativity. These factors included different topics such as online learning, technology advantages and disadvantages, economic changes, and political affiliation.

The most frequent topic was mentioned by all interviewees was virtual learning during the COVID pandemic and its influence on students and instructors. Almost all the participants talked about a variety of challenges they face in their teaching due to the shift to online education. Participant B explained this shift changes teachers' expectations of students' performance:

> *I'm trying to shift my expectations. Like, I don't think that they should be the same... for now I just ensure that they walk away with what they need and not bog them down too much with things that they don't need. So really trying to prioritize the learning outcomes of the class in a new way.*

Participant B needed to prioritize the most important learning outcomes in order to help the students working independently in an asynchronous online environment succeed. Participant D also talked about students' performance with online learning, and the importance of having a flexible attitude toward their final work, and setting no expectations, saying: *"So I don't know what to expect this semester from my students' results. So that's when you have to be flexible."*

Many students and instructors face difficulties with virtual environments feeling isolated and maybe less motivated. Participant B shared,

> *I think to work on virtual classes this combination is really hard for a lot of students and teachers. I don't get to leave my house a lot and maybe my house is not the most conducive for teaching for whatever reason. Also with this*

combination of learning, I have to be very more self-motivated or really up on my time management, and it takes a lot of effort for the content organization to fit.

Online education is not ideal for some classes like drawing as Participant D observed. It is hard to follow students and guide them through the camera without being physically around; however, there are other creative ways to overcome the miscommunication issues.

Now I feel like it's so hard to teach drawing online. Because you can't reach through and say no, try it this way and you can't assess the quality, you know, of the drawing, and so I'm struggling with that a bit when trying to be creative about how to handle that. But I think there are other creative things we can do.

Participant I agreed online learning is difficult in studio-classes, where the teaching pedagogy depends on providing examples and coaching students having problems. With online classes, the relationship aspect and human interaction between the instructor and students are less:

I would spend a lot of time since as a studio, of course, being able to sit next to a student sketch it to look at their sketches and be able to work it together, which is a lot more difficult this way (online)...You know there are three students in my class now I didn't even know what they look like, because you don't have to turn your camera on… I think it's harder to build that relationship now, because you're doing it in front of everybody but it's on the screen and just feels like everybody's just watching you, where they could be working on something.

Participant K noted virtual learning impedes social interaction contributing to the development of skills and creativity in students, which is critical in some subjects, as explained:

> *And that interaction socially in the classroom is really critical, and so I'm having a hybrid model this semester because I didn't want to give up that social aspect of teaching...I think there's something beneficial about the social nature of learning...You get inspired when you don't know how to do something... you know like you find out those things right and your classmates and so that's going to be missing this semester for a lot of people that are using zoom.*

On the contrary, few participants expressed their opinion about the advantages of online learning. Participant G claimed virtual learning expands instructors teaching methods and honing the special tools needed to teach effectively. Besides, virtual learning allows instructors to promote their creativity and to adopt innovative teaching methods. New teaching strategies such as bringing guest speakers virtually keeps students motivated and engaged, as Participant G says:

> *The COVID Pandemic has spurred the adoption of distance learning at all education levels...Virtual learning actually expands our pool of influence and our pool of resources...The interesting thing that I discovered about virtual learning is that I could ask a friend from North Carolina to speak to my class so easily.*

In the same manner, Participant J said virtual learning inspires instructors to find advanced tools and approaches that improve students' learning interactions and experience:

> *Well, if next semester it's going to be online, you know, they're going to be kind of bored and zoomed out and sick of it. So, I'll have to think about some different ways to do the advanced buying class and maybe, you know, bring more interaction, more video and conversation versus lecture, textbook, and that kind of stuff.*

Overall, participants acknowledge online teaching has strengths and weaknesses, and it requires a learning curve for students and instructors. Virtual learning can be complicated for educators who are accustomed to traditional teaching, and for students who must use technology in all of their coursework.

Participant A believes depending on technology depletes creativity, saying: "*Well, I could argue about technology that is kind of depleting some creativity because, again, I think that it is important to create a dialogue around what you're creating."* Participant K has a similar opinion that sometimes students rely on two-dimensional technology and lose their three-dimensional, sensory experience of the world, which is critical:

> *I always tell my students you have to go beyond Pinterest and other kinds of things whether it's Google searches...Students often think that their computer represents the entire universe. I say no. The computer is actually an inter-to-net subset of the universe. Universe has things in it and on it and experiences that the computer cannot even replicate. Yeah, try to lick your keyboard. What does it taste like, you know, can you smell the screen? If the person you're zooming with is wearing perfume. Can you tell...so there's a lot of sensory experiences that should be part of our toolkit.*

Besides technology, COVID pandemic has changed the economy, causing some families to struggle financially or emotionally, which is tough and impacting students' mental health, Participant A stated the:

> *Now, of course with the economy that is shaken and families that are struggling to figure out how to take care of younger siblings, or perhaps a parent that's sick, or a family member, or just kind of being in fear about the kind of engagement you have with people. Whether you're going to get ill, I mean, that's a lot to handle.*

This study was collected during both the COVID pandemic and the 2020 United States presidential election. Participant A observed political affiliation could impact students' performance and instructors in the classroom and make them feel uncomfortable or less collaborative:

> *I have a student who wears a mask in my class that has their candidate voice in big letters and there's kind of a super irony that campaign device...and it's aggressive to me, and I have three students of color that sit six feet around this person sensing they feel uncomfortable. But you know, the association puts me really in a kind of difficult place, I believe in free speech and I believe you know*

in a democracy and I would never say anything that concerned my students or make them feel uncomfortable, but it is really difficult to balance that.

The factors affecting creative teaching practices are local, national and international, and they are challenging both students and instructors to adapt their practices to enact their commitment to teaching creativity.

Analysis, Interpretation, and Synthesis of Survey Findings

Finding 5: There are no significant differences in creativity-fostering behavior levels between the design instructors who teach studio or non-studio classes; both instructors apply the same level of creativity-fostering behaviors in their teaching.

This section summarizes and organizes the information collected through the survey and questionnaire completed by the participants. The responses included the CFTIndex score results and the teachers' replies to the survey questions. The statistical analyses explored the second and third research questions which are:

What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

Moreover, the analysis tests the first proposed hypothesis of this study: Design studio instructors score higher in CFTIndex than other non-studio design instructors.

Descriptive Characteristics of Respondents

Of the survey participants (n=37), 17 were men, 19 were women, and 1 person did not reveal her or his gender. All the participants teach college students at the undergraduate and graduate levels.

Participants were diverse in terms of age, with the largest group indicating that they were between 50-59 years of age (n = 15). See Table 6 for more details.

For the participants' educational degree levels, the majority of interviewees have master's degrees (n=19), while 13 have Ph.D. degrees, and six have bachelor degrees. See Table 7 for more details

Number of participants	Age range
1	29 or under
5	30-39
5	40-49
15	50-59
10	60-69
1	70 and above

Table 6. Showing number of participants and their age range

Number of participants	Participants education degrees
19	Masters
13	PhD
6	Bachelor

Table 7. Showing number of participants and participants educational degree

Almost half of the participants teach studio classes (n=19), while 10 participants teach both studio and lecture classes, and 7 teach only lecture classes. See Table 8 for more details.

The majority of the participants have teaching experience of at least 23 years. Ten participants have teaching experience from 12-17 years. Six participants have teaching experience from 2-6 years, whereas the other five participants have teaching experience from 7-11 years. See Table 9 for more details.

Number of participants	Type of class	Test scores means range
19	Studio class	228
7	Lecturer class	232
10	Studio & lecturer	227
1	Other classes	212

Table 8. Showing the number of participants and type of classes and their test scores means range

Number of participants	Years of teaching experiences	Test scores means range
6	2-6	209
5	7-11	234
10	12-17	218
3	18-22	214
13	23 and above	237

Table 9. Showing number of participants and years of teaching

Analysis of Survey Data

The CFTIndex is a 45-item self-rating assessment of nine theoretically distinct subscales. Each subscale consists of five statements. Statements are rated using a 6- point Likert scale, ranging from 1 (completely disagree) to 6 (agree completely). The nine subscales are based on creativity-fostering behaviors first identified by Cropley (1997). The higher scores indicate teachers perform more creativity-fostering behaviors in the classroom. Overall the mean score for the 37 survey participants was 228.

Independent-sample t-tests were conducted to compare the creativity-fostering behaviors test results for instructors who teach studio classes with those who teach non-studio classes. The results show that there were no significant differences in the

instructor's creativity-fostering behaviors test scores results when they teach studio classes (M = 228.53, SD = 26.235) and lecture classes (M = 232, SD = 20.183) conditions; t (24) = -.316, p > .05.

These results suggest instructors' creativity-fostering behaviors are not significantly different if they teach studio classes or lecture classes.

However, the results show there were significant differences in the instructors creativity-fostering behaviors test scores results comparing with their number of years of teaching experience (teaching experiences from 2 to 6 years) (M = 246.33, SD = 10.017) and group four (teaching experiences from 18 to 22 years) (M = 209.33, SD = 11.639) conditions; t (7) = 4.672, p <.002 These results suggest instructors' creativity-fostering behaviors are varied amongst instructors who teach for a long period of time from 18-22 years. This suggests when instructors teach for a long period of time, they show more creativity-fostering behaviors in their teaching.

Group numbers	Number of participants	Years of teaching experiences
There were no significant differences	6	2-6
	5	7-11
	10	12-17
t (7) = 4.672, p <.002	3	18-22
t (17) = -2.713, p < .015	13	23 and above

Table 10. Showing group numbers of participants and years of teaching

Further analysis revealed there were significant differences in the instructors creativity-fostering behaviors test scores results comparing with their number of years of teaching experience (teaching experiences from 2 to 6 years) ($M = 209.33$, $SD = 11.639$) and group five (teaching experiences from 23 years and above) ($M = 237.31$, $SD = 23.708$) conditions; $t(17) = -2.713$, $p < .015$. These results suggest instructors' creativity-fostering behaviors are varied among these who have thought for a long period of time (for 23 years and above). This suggests when instructors have more experianced, they show more creativity-fostering behaviors in their teaching.

Interpretation of Survey Data

Although the sample size was small, an interesting relationship was found between the number of years of experience instructors have and their CFTIndex results. The relationship indicates teachers who participated in this study and have many years of teaching experiences were more likely to demonstrate higher levels of creativity-fostering behaviors. This suggests when instructors are more experienced, they see themselves as more likely to motivate students and demonstrate more behaviors to enhance creativity. These instructors are also more likely to apply more of the creative and behavioral aspects identified in the qualitative results, such as writing reports, reading and researching, involving discussions, going on field trips, bringing guest speakers, holding brainstorming sessions, making critique, and feedback, encouraging flexible thinking, motivating students, using humor, introducing nonsense, creating games or competitions, and promoting students thinking in other different ways.

The participants in this study revealed their teaching activities and exercises to be based on their teaching and previous working experiences. Instructors stated applying

these activities depended on the curriculum and students' reactions in the class. Some of these activities have goals and objectives, and others rely on students' interactions in the classroom.

These quantitative and qualitative findings reveal having more years of experience and teaching aligns with the design instructor's attitudes about and self-efficacy to foster students' creativity in the classroom. These instructors become more skillful at engaging students in learning and give more emphasis on developing student's achievement.

Summary

The data provides a glimpse of the design instructors' experiences and perceptions of their own creativity-fostering behaviors. In this study, the majority of the design instructors reported fairly high levels of creativity-fostering behaviors in general, and the highest levels of creativity-fostering behaviors were also shown by the instructors with the greatest number of years of teaching experience. Using the survey and interview data together provides a more nuanced understanding of what, why, and how creativity-fostering behaviors are demonstrated by design instructors in the classrooms.

The aim of this study is to investigate design instructors teaching creative behaviors, beliefs, and practices in the classroom. The knowledge emerged from interviewing the instructors about creative teaching and practices resulted in five major findings.

1.Design instructors define creativity as a multifaceted phenomenon, and creative instructors share the attributes of being motivated, enthusiastic, and flexible, as well as having an open mind and empathy for students.

2. Design instructors believe creativity is required in the design field and enhancing students' creativity is important.

3. There are several activities and practices design instructors apply in their classroom teaching to foster students' creativity, and these practices can be evaluated and assessed in multiple ways.

4. There are several factors influencing creativity in classroom practices, most notably related to educational institutions, classroom environments, student experiences, and other factors beyond school.

5. When instructors gain more years of teaching experience, they see themselves as more likely to motivate students and demonstrate more creative behaviors to enhance creativity.

The findings are discussed in Chapter 5.

Chapter V: Discussion

Overview of the Research Study

Many researchers have emphasized the importance of creativity in teaching (Epstein, 1996; Sternberg, 1999; Cropley, 2000; Runco, 2007; Sawyer, 2012). Enhancing creativity in teaching is vital, because it promotes students' learning and development (Sawyer, 2011; Horng et al., 2005). Since creativity has a great impact on students' learning and growth, it is important to understand how instructors view it, nurture it, and practice it in the classroom. Despite that, the literature review reveals there is limited research and knowledge about creative teaching.

The purpose of this research study is not to judge an instructor's creativity or value a specific classroom practice. Indeed, the aim of this research is to investigate creativity and understand creativity-fostering beliefs, behaviors, and practices that design instructors demonstrate in their classrooms. This study asks the following questions:

1-What are the beliefs, practices, and creative behaviors that design instructors demonstrate in their teaching that foster students' creativity in the classroom?

2-How do design studio instructors differ in their approaches for teaching creativity, depending on teaching studio vs. non-studio courses?

3-What are the creative behaviors that design instructors demonstrate in their teaching in the classroom that align with and go beyond their CFTIndex results?

This study answers these questions in three ways. First, this study examines the related literature in both design creativity and education.

Second, this study conducts a quantitative investigation to measure the creative behaviors of design instructors using the CFTIndex and explores the difference between instructors who teach a studio, non-studio classes.

Third, this study conducts a qualitative investigation that identifies design instructors' creativity-fostering beliefs, behaviors, and practices to understand how these activities work together.

The literature review discussed and categorized the studies that were significant to creativity and education in four areas and associated with the existing gap that many studies have investigated creativity in education, but far fewer have assessed the instructor's creative behaviors in design education.

This gap of knowledge makes it necessary to investigate design instructors' beliefs, behaviors, and practices in the classroom.

The mixed-method approach was used to reveal a variety of different perspectives, which gives a deeper understanding of the topic being investigated. This study applied a quantitative approach using the CFTIndex and combined it with a qualitative approach. The participants of this study were design instructors working at the College of Design at the University of Minnesota, Twin Cities. The survey was sent to 130 instructors across the College of Design.

The data collected included instructors' demographic information (gender, age), educational degrees, teaching experience, academic programs (for example, Architecture, Landscape, Apparel, Housing, Interior and Graphic design), students' standing levels, primary courses they teach, and modality (studio or lecture class), and the CFTIndex questionnaire. Subsequently, interviews were conducted online through Zoom with the

selected participants to learn about the instructors' creative teaching experiences. Descriptive data was interpreted, coded, and analyzed to identify the instructors' creativity practices, beliefs, and creative behaviors.

The findings in chapter (4) revealed the interviewees' insights about creative teachers as they explained their teaching experiences in enhancing students' creativity. The five major discoveries that occurred from the findings are discussed in the following sections.

The first discovery defines creativity as a multifaceted phenomenon and identifies the attributes of creative instructors as being motivated, enthusiastic, and flexible, as well as having an open mind and empathy for students.

Second, design instructors believe creativity is essential in the design field and enhancing students' creativity is important in the classroom.

Third, design instructors apply several activities and practices in their classroom teaching to foster students' creativity, and these practices can be evaluated and assessed in multiple ways.

Fourth, several factors influence creativity in classroom practices, most notably related to educational institutions, classroom environments, student experiences, and other factors beyond school.

Finally, there are no significant differences in creativity-fostering behavior levels between the design instructors who teach studio or non-studio classes. Both types of instructors apply the same level of creativity-fostering behaviors in their teaching. Moreover, when design instructors gain more years of teaching experience, they see themselves as more likely to encourage students and perform more actions that enhance their creativity. These findings help us to answer the research questions.

The results that have emerged from research overlaps with the existing literature. The findings also show design instructors apply and promote creativity in their teaching through several approaches. The following section present the study results and answers the three research questions.

Design instructors' beliefs, practices, and creative behaviors

The participants in this study shared their beliefs about enhancing creativity in the classroom. The participants' discussions were around the Four-P Model of creativity: person, process product, and press, which was developed by Rhodes (1987). In the discussion of this study included, the *person* refers to the instructors or students; the *process* is related to the environmental factors that impact creativity; *products* include the exercises and the process for fostering creativity; and *press* is the environment or the surrounding contexts.

As Piirto (2010) states, "Creativity is in the personality, the process, and the product within a domain in interaction with genetic influences and with optimal environmental influences of home, school, community and culture" (p. 392).

Guided by their past experiences, expectations, and teaching methods, design instructors define creativity as a multifaceted phenomenon. The results suggest instructors look at creativity as a broad concept, which could be defined as an alternative way of thinking or looking at things from different perspectives. Each participants described creativity differently, but all of them shared their opinions that creativity is essential in design education. The participants identify creativity as a process that requires a series of activities such as thinking, trying, making, discovering, explaining,

engaging, finding, exploring, developing, understanding, imagining, solving, and creating. These definitions that emerged from the findings overlap with literature in this study and are similar to how other theories looked at creativity such as: Cropley (1992), Sternberg & Lubart (1996), Rhodes (1987), Robinson (2005), Plucker, Beghetto (2004), and Runco (2014).

Teachers' behaviors and actions are based on what beliefs they adopt and believe to be true, regardless of whether they can support that representation with evidence or not (Bereczki & Karpati, 2018). Bandura (1997) asserted that an individual's beliefs are what guide personal goals, reactions, emotions, actions, and decisions, not necessarily known truths. See Figure 1.

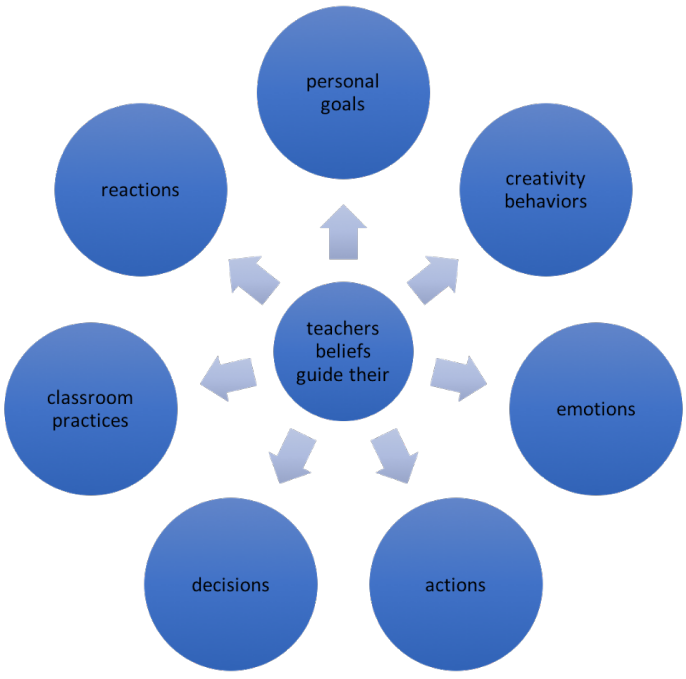

Figure 1. Teachers beliefs impact and actions

Prior investigations indicated teachers' creative behaviors and perceptions of creativity are often divided into two aspects (Bereczki & Karpati, 2018).

They can be implicit or explicit aspects (Kagan, 1992; Kaufman et al., 2006). There are several implicit and explicit aspects that impact teachers' creativity fostering behaviors, which include abilities, gender, age, experiences, and personalities (Aljughaiman & Mowrereynolds, 2005; Bamburg, 1994; Runco & Johnson, 2002; Saracho, 2011).

Participants believe that creativity is significant and not limited to design or education only, but also appears in the participants' daily activities, their working field, and personal self-expression. This perception is consistent with Lewis (2005) who found that in higher education fields it is important that design instructors teach more than the basic knowledge of subject materials, or technical skills and techniques; they must go beyond these basic concepts to develop students' learning.

Participants in this study believe that creativity and enhancing students' creativity is important. Participants believe all design fields require creativity because it is evolving and serving humanity, and it is an explicit part of their higher education experience. The results suggest that design instructors sometimes encourage students' creative thinking intentionally or unintentionally, depending on the learning goal. Instructors stated applying activities depends on the curriculum and students' reactions in the class. Some of these direct activities have goals and objectives, and others rely on students' interactions in the classroom.

Participants perceptions are parallel with Beghetto and Kaufman (2010), Jeffrey and Craft (2004) Sternberg (2015), and Newton (2013), who believe that creative instruction is an important aspect of developing creativity and has significant advantages to students' learning. To justify the significance of developing creativity in higher education, Jackson (2006) declared that if "the purpose of higher education is to help students develop their

potential as fully as possible at this level, then enabling students to be creative should be an explicit part of their higher education experience" (p. 1). It is important to bear in mind teachers' beliefs are not the only factor impacts teachers' creativity practices in the classroom. Scholars have claimed examining more aspects, such as teachers' behaviors, attitudes, or characteristics, can explain teachers' decisions and processes in detail, specifically the ones leading to creative instruction in the classroom.

The participants in this study adopted a wide range of practices to foster creativity in their students, both inside and outside of the classroom. All the exercises developed by the instructors focus on two aspects: first, exercising students' creative thinking and behaviors, and, second, enhancing students' understanding of creative people and their creative processes. Most of the creative exercises concentrate on specific thinking or behavior skills, and have main objectives; however, sometimes these exercises were for training purposes and could be spontaneous based on the students' interactions and attention in the classroom. Participants explained some of the activities that enhance students' creative thinking and behaviors. These include discussions and presentations, asking questions, exploring and experimenting, reading and writing, critiquing, brainstorming and feedback sessions, using multimedia platforms, community building, incorporating humor, and games, and asking questions. Interestingly, the research about effective and creative teaching activities and practices replicates much of what the participants said about enhancing students' creativity.

Tomlinson (2001) found that each student has a specific learning style regardless of their abilities, and all students must be involved and progress in the classrooms through different exercises. Fasco (2001) revealed teachers may stimulate creativity by

encouraging divergent thinking through activities such as providing knowledge and information sources, admitting student interests, and presenting ideas in the classroom. Davis (2003) stated contemporary creativity training focuses on four aspects: cultivating creative attitudes, improving understanding of the creative process and creative people, exercising creative behaviors and thinking, and teaching specific creativity methods. Despite the lack of research studies on teachers' creativity-fostering behaviors, there are several parallels in the literature indicating teachers' behaviors and practices may either stimulate or inhibit creativity development in the classroom (Fleith, 2000). Understanding and applying the appropriate practices to increase students' learning engagement and interest could increases students' motivation to learn and encourages their creative learning ability.

The passages in Chapter 4 describe how design instructors developed and evaluated their classroom exercises. The participants revealed that their classroom creative exercises and activities were inspired by their past experiences as students, their teaching expertise, or their working practices. Some participants stated their creative exercises are derived from their educational background in grad school. But, in most cases, participants stated that their interaction with colleagues, mentors, peers, and students was another way to get inspired to develop creative exercises. Moreover, the participants in this study said they usually evaluate the effectiveness of the creative exercises implemented in their teaching.

Participants used a variety of assessments to monitor the quality of classroom instruction, including student evaluation of instructor's performance in the classroom, instructor's

assessment and observations of students' reactions and attitude toward class activities, student self-reflection, and debriefs.

In addition, all the participants confirmed that using the annual evaluations was a perfect indicator for assessing the quality of creativity activities. Some instructors explained they design their own students' evaluations, and the others ask questions about certain exercises.

Some precedent studies suggested instructors' assessments of classroom exercises and activities are important for students active learning. Karpova, Marcketti, and Barker (2011) found evaluating creativity exercises helps instructors understand how to develop students' creative thinking which is a critical aspect of professional development. Demirkan and Afacan (2012) suggested that one of the methods of supporting students' creativity in the classroom is assessing student's creative work. They emphasized students' results can be evaluated by using several methods such as assessing their creative context, or through a creative process, or by looking at their creative achievement of design outcomes.

In the quantitative investigations, that the majority of the participants reported fairly high levels of creativity-fostering behaviors through the CFTIndex. The results showed that there were no significant differences in creativity-fostering behavior levels between the design instructors who teach studio or non-studio classes. All design instructors, whether they teach studio classes or non-studio classes, expressed the same level of creativity-fostering behaviors in the CFTIndex test results. However, the results also revealed that there are differences between teachers' creativity behaviors and their

teaching experience. With more years of teaching experience, instructors show more creative practices and behaviors in their teaching.

The qualitative investigations disclosed two characteristics of the instructor's creative behaviors that were aligned with CFTIndex--motivation and flexibility. The interviews revealed additional characteristics that go beyond the CFTIndex such as being enthusiastic and open-minded as well as having empathy and a sense of humor. These findings affirm what other researchers have found. Dollinger, Burke, and Gump (2007) found that in higher education being open-minded has been perceived as a sign of creative behaviors, especially in creative drawing tasks and creative behavior assessments. Horng, Hong, ChanLin, Chang, & Chu (2005) indicated that creative instructors are usually open-minded, have curiosity, risk-taking, independence, open-mindedness, humor, self-confidence, flexibility, and aesthetic orientation. Hamza and Griffith (2006) suggested that creative teachers must be approachable, friendly, knowledgeable, interesting, caring, insightful, and imaginative.

The creative behaviors that design instructors discussed include sharing experience and knowledge, creating a supportive climate for discussing ideas, and considering equity and social justice, all while tolerating behaviors associated with creative production. These ideas regarding teachers' creative behaviors and actions are based on what beliefs they adopt, regardless of whether they can support that representation with evidence or not (Bereczki & Karpati, 2018).

The participants in this study affirmed the benefits of creative learning and teaching for student development. The instructors indicated that the design field demands enhancing creativity not only in students' classwork, but also after graduation in their

future and working career. Cultivating creativity influences students' ability to express themselves, reveals their creative thoughts, and influences their openness to new learning experiences and idea-generation. Lau, Ng, and Lee's (2009) investigations revealed the significant role of creativity training in design education. The results of their study underline the advantages of cultivating creativity as a crucial aspect in students' learning: it enhances students' creative design abilities, helps students to release their creative thinking, and involves producing innovative ideas and solutions. These perceptions stand with the earlier research which suggested that creative teaching is an important aspect of learning and has a significant impact on students' learning and growth (Sternberg, 2015; Beghetto & Kaufman, 2010; Jeffrey & Craft, 2004).

All the participants in this study stated that creativity is for everyone and can be developed and encouraged in the classroom; however, sometimes there are factors that could prevent creative teaching, which is related to the educational institutions, classroom environments, student experiences, and other factors beyond school. Most of the participants' discussions focused on the factors that can be changed or adjusted in the classroom and environment such as: resources, students' social interactions, classroom size, the flexibility of moving furniture, and daylight.

The instructors in this study affirmed they are unable to change some factors that reduce creativity in the classroom, however, they feel somehow enabled by having control of the activities associated with their instructional practice.

Instructors' insights correspond with several studies which stress the impact of environmental factors and how those inhibit or enable creativity and inspire people. The physical and socio-environmental factors play an important role in the creative work process, as noted by

Dul & Ceylan (2011). McCoy and Evans (2002) pointed out the elements of space, such as lighting and room size, promote the creative potential of people working in the space.

Another unexpected finding of this study was the challenges of teaching online due to the COVID pandemic and how it slowed teachers' and students' creative practices. Participants complained virtual learning is difficult for many students and teachers. It takes effort to prepare, and is time-consuming. In addition, participants observed that online learning is specifically difficult for teaching studio classes. It is not ideal for subjects that require practical interaction, where the teaching pedagogy depends on providing examples and coaching students who are having problems. Some of the participants stated online learning could slow creative thinking. With online classes, the relationship aspect and human interaction between the instructors and students are less; it's hard to follow students and guide them through the camera without being physically around.

These ideas regarding the impact of online teaching and learning on students and teachers have been discussed in recent studies such as Pokhrel & Chhetri's (2021) research reporting on the impact of the COVID-19 pandemic on online teaching. Pokhre and Chhetri's (2021) found virtual learning is challenging for many educators and the education system due to "larger class strength, lack of online teaching infrastructure and professional development, and non-participative nature of the students." Moreover, the findings of Pokhre and Chhetri's (2021) suggested teachers and students should be oriented on the use of different online educational tools. Even after the COVID-19 pandemic resume, they stated teachers and students should be encouraged to keep using online tools because it enhances teaching and learning in some way.

Moralista & Oducado (2020) also found instructors need to adapt to the changes with online education. In order to do so, instructors need to be competent in their role and acquire the necessary skills to ensure that they are able to effectively facilitate student learning and positively impact student outcomes. The different perspectives between the study participants and new research suggest instructors and students have different demands to creatively thrive in the online educational context, and these demands need more investigation.

In conclusion, the findings of this study revealed that design instructors have a genuine interest in developing students' creative abilities. The results of this study also show both design instructors who teach studio and non-studio classes demonstrate similar levels of creative behaviors and teaching practices to encourage students' creativity. This was again confirmed by the instructors who revealed their teaching activities, beliefs, and practice enhance students' creativity. This dissertation ascertains design instructors are seen as facilitators of creativity development in the classrooms and act as creative professionals. Instructors' teaching experience influences students' learning and creative development. As the quantitative results showed, expert instructors who teach for 18 years or more could provide more learning opportunities and identify students' diverse demands in a unique way of teaching. Further investigations are needed to find out more about how these expert instructors teach and facilitate their students' creative thinking in their classrooms.

Limitations of the Study

Because researchers attempt to study phenomena, interpret data, and make sense of it, this type of research always has some underlying limitations that are related to the researcher's constructing meaning. This current research seeks to acknowledge the assumptions and minimize the researcher's bias throughout the process of this study.

The interview participants were selected through the survey questionnaires to achieve reliability. The research questions were tested on a pilot study to obtain clarity. Furthermore, almost all the themes were included in the findings, even though some of them seem insignificant or were mentioned only one time or by one participant.

Measures were taken during interview protocols to ensure that the same questions were asked of each interviewee. These precautions were taken to validate the results.

The purpose of this research study was to investigate design instructors' teaching creativity behaviors, beliefs, and practices in the classroom. Although this study is not generalizable, there are several concepts and ideas explored in this research that discuss realities experienced by the instructors who participated. The findings provide a better understanding of overarching themes, such as design instructors' perspective on fostering students' creativity in the classroom, the activities they apply in their teaching, how they evaluate those activities, and the factors that influence their teaching practices.

Due to the COVID pandemic and online teaching, the interviews were conducted online through Zoom, and there was no face-to-face interaction with instructors. The intended triangulation process could not be completed because there were no observations of the instructors teaching in the classroom.

One of the limitations of this study stems from the limited number of participants. The survey was sent to 130 instructors across the College of Design, 37 participants completed the survey, and later invitations were sent to 33 participants, and 11 agreed to be interviewed. Therefore, this study was limited to a small group of teachers, who chose to participate in the research. This small number of participants might be due to the challenges that instructors faced with moving instruction online, such as the time constraints discussed by the interviewees. The length of the CFTIndex might be another factor that prevented some instructors from participating or completing the survey, as two participants started the survey and did not complete it.

It is expected the instructors who chose to participate in this study have pre-existing interests in creativity, were more attentive or consciously thinking about it, and were keen to improve their teaching practice. Moreover, the small sample size impacts the quantitative results and limits the ability to test the second hypothesis that design studio instructors would score higher on the CTFIndex than non-studio design instructors.

Using the CFTIndex as an assessment to measure instructors' creativity behaviors might be also a limitation of this study. The CFTIndex relies upon self-assessment of creativity fostering teaching behaviors, which means that instructors have to rate themselves based on their personal opinions of creativity behaviors. Some instructors might give themselves higher or lower scores, which could impact the final results. Moreover, some instructors might misinterpret the meanings of the CFTIndex statements, leading to inaccurate self-assessments.

Although there are some limitations to this study, the research design is valid because the findings answered the research questions. The study design and research questions are arguably reliable because the outcomes and pilot study have shown they can be replicated; however, larger sample size will be needed for significant results.

Recommendations for Future Research

Instructors' teaching perceptions about creativity beliefs, behaviors, and practices in the classroom is a rich topic for further research. The literature revealed that there is interest in investigating and measuring the creativity fostering behavior of teachers. Based on the findings of this research, four suggestions for further research are proposed.

The first draws from the limited number of responses on the survey questionnaire. For future research, it is recommended that the sample size is expanded and include more instructors from the same college. Expanding the

sample will provide a strong basis and develop stronger empirical data related to teachers' creativity characteristics. With a larger sample, the result can be generalizable and conclusions could be drawn from this data.

The second recommendation involves the CFTIndex, although this study used the CFTIndex to measure/investigate teachers' type of class (studio and non-studio class) with instructors' teaching creativity behaviors, this tool would be more appropriate in a study that uses a larger sample size and compares teaching creativity between different majors, or colleges across geographical areas. A comparison between instructors in the design field with other disciplines could also show design is significantly related to creativity.

To go beyond teacher self-assessment, the CFTIndex could be modified and tested on students by re-wording the instrument statement such as: "I and my students" with, "our teacher and we students, respectively". The modified student's version could be used for a correlation between instructors' results and their students' ratings to correlate and compare as another kind of evidence to validate instructors' scores.

The third recommendation would be a deeper investigation of the most frequent instructors' creativity behaviors identified in both the literature and these results. A new direction would be to create a survey with a list that includes several behaviors and characteristics and asking instructors to rate them from most important to least important and asking why. Other evidence beyond this survey, such as classroom observations, is also needed to understand and illustrate

instructor behaviors. These classroom observations would add a new dimension to understand the survey results.

Finally, new research could also examine and compare the classroom practices and activities that can encourage students' creativity development by interviewing both instructors and students. Such future investigation could also focus on the influencing factors that affect students' creativity and are related to their perceptions of the class environment and personal factors in their own lives. An additional investigation could also aim to identify more creative attitudes and characteristics. Creativity is a skill that can be promoted with practice and training. It would be interesting to learn how other instructors in other fields or around the world enhance and encourage students' creativity.

Ultimately, these research findings might encourage future researchers who are interested in enhancing creativity, evaluating, and applying it in the classroom. It revealed current knowledge and studies on fostering creativity in the design domain need additional exploration. Because of the role of creativity in innovation and students' development, creativity must become one of the important topics for investigation. Moreover, the review shows that there is a lack of research on creativity in design education (Demirkan & Afacan, 2012). The practices and activities that are utilized by instructors might be inspire some instructors on how to build their own practices.

Design instructors believe that creativity is important in the classroom and students' future development. Despite the COVID pandemic's impact on some of their classroom practices, design instructors are still trying their best to support students' learning and cultivate their creativity.

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Appendix A: Invitation to Participate

Hello, College of Design Instructors!

You are invited to participate in my dissertation research about fostering creativity in the classroom (IRB-00008159; please see the attached the Study Information Sheet linked in the survey below for more information.). This survey is intended to gather information about design instructors' teaching experiences. The survey will take a maximum of 9 minutes of your time to complete. Upon completion of the survey, you will be able to enter a drawing for a gift card in appreciation of your time. All the data that will be collected is confidential and participants will not be identified in any way in the results. Participating in this study will help me as a researcher and other design instructors who are interested in nurturing creativity in the classroom to improve the design class curriculum and develop exercises or activities that develop students' creativity.

Follow this link to the Survey:

https://umn.ca1.qualtrics.com/jfe/preview/SV_0PaD4svRKAGktAV?Q_SurveyVersionID=current&Q_CHL=preview

Please if you are having any question or technical problems taking the survey, please contact Kabli00@umn.edu

Thank you for taking the time!

Appendix B: Invitation to Interview

Hello Professor ….

Thank you for completing my survey about the teaching experiences in classrooms!

My name is Tasneem, I'm a Ph.D. candidate in the Graphic Design program at the College of Design. I am contacting you because your survey results show that you exhibit creative teaching behaviors, and you are in an ideal position to provide the study with more valuable insights

Therefore, I would like to invite you to participate in the second part of the study (interview) to learn more about your own teaching experiences, beliefs, and practices that support student creativity.

The interview is minimal, requiring one hour of your time. I am open to scheduling any time that is convenient for you, including weekends.

Please think it over and let me know if you would like to participate, and if so, suggest a day and time that suits you. If you have any questions, please do not hesitate to ask.

Your participation would be highly appreciated.

I look forward to hearing from you soon!

Thank you very much,

Tasneem Kabli

Appendix C: Consent Form

CONSENT FORM TO PARTICIPATE IN STUDY
Tasneem Kabli, University of Minnesota

You are invited to participate in a research study about exploring creativity teaching in classrooms. You were selected as a participant because you are an instructor at the UMN, College of Design, and have teaching experience. Moreover, you have participated in phase 1 of this study (survey), and your results showed that your classroom teaching practices exhibit creative teaching behaviors.

Background Information

I am a doctoral candidate at the University of Minnesota at the College of Design. The purpose of my research is to know more about teachers' creativity practices in classrooms. I am interested to know how teachers foster students' creativity in their teaching.

Procedures

As a reminder, phase one of this study involved taking the online survey (Creativity Fostering
Teacher Behaviors Index (CFTIndex) by Soh (2000). The survey measures teacher's behaviors
necessary for fostering student creativity in a classroom setting. The CFTIndex is used worldwide. The goal of administering the test was to identify creative teachers and to select them in the second part of the study.

Phase two involves a 60-minute interview. The interview focuses on the teacher's classroom creativity teaching practices, exercises, and experiences. I will record the interview through zoom so it can be transcribed later for data analysis.

You are asked to consent to the procedures at the end of this form. This study is focused exclusively on your teaching opinion and experience. The study will not solicit any inquiries or information from others about your professional practices.

Risks of Participating in the Study

The study poses minimal risks. The direct interview will ask you to share your teaching ideas, practices and experiences. You may refuse to answer questions that may make you uncomfortable.

Confidentiality

The survey results and interview answers will be collected, remain confidential, and securely stored with the researcher. Anything stored on the researcher computer is password protected. No individual names are indicated on any reports or presentations. Final reports and presentations do not include any information that would allow a participant to be identified. The survey results will remain strictly confidential. Research records collected in phase two will be kept in a secure, safe location and only I will have access to such materials. All data and records generated throughout this study will be handled with the same rigor for confidentiality. These protocols will remain in place until the study is complete, at which time all data and records collected during this study will be securely destroyed and shredded on or by September 2021.

Voluntary Nature of the Study

All participation with this study is voluntary. The decision of whether to participate in the study will not affect your relationship with your employer or the University of Minnesota. If you decide to participate, you are welcome to refuse answering any question or withdraw your participation at any time without affecting the aforementioned relationships.

Contacts and Questions

Please contact me if you have questions or comments about any part of this study. If you have questions for the supervising professor of this study, please contact Dr. Brad Hokanson at brad@umn.edu. If you have any questions or concerns of the study that you would like to discuss with someone other than myself or Dr. Hokanson, you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware Street SE, Minneapolis, MN 55455, or (612) 625-1650.

Please indicate your consent to the following by initialing each of the following:

____ I consent to participating in this study, and to be interviewed for phase 2.

____ I consent to allowing the researcher the authorship to use the information collected to support the intent of this research.

____ I consent to the researcher collecting an audio recording of my interview.

Participant Info

Name _____
First Last

Signature ____ Date ___________

E-mail ____

Appendix E: Pre-Interview Prompt

Hello ….

Thank you for meeting me today.

I will introduce myself, my name is Tasneem, I am a doctoral student at the graphic design program. I'm interested in teaching creativity in design education.

My study aims to investigate design instructors' creativity teaching and practices in the classroom. The purpose of my research is to understand how instructors recognize creativity in their students and how they enhance it. What kind of method they use.

If you don't mind I'm going to record the interview so I can use it later for the data analysis.

Your CFTIndex results showed that you preform creativity fostering teaching behaviors. Therefore, I'm interested to learn more about your teaching experiences in the interview today.

Before I proceed with the interview I just want to let you know that your responses may be referenced in my study, but your identity will remain confidential.

study, but your identity and the school's identity will remain confidential.

Also, thank you for signing the consent forms in advance, do you have any questions before we start?

Appendix F: Online survey

Name

Email address

Gender

Male	Other
Female	Prefer not to say

Your age

29 or under	50-59
30-39	60-69
40-49	70 and above

Degree of your education

Bachelor's degree	PhD degree
Master degree	

Years of teaching experience

2-6	18-22
7-11	23 and above
12-17	

Primary class you teach

Studio class	Studio and Lecture
Lecture class	Other classes

Primary courses you teach

Your students class standing levels (you can select more than one)

Freshman	Senior
Sophomore	Masters
Junior	PhD

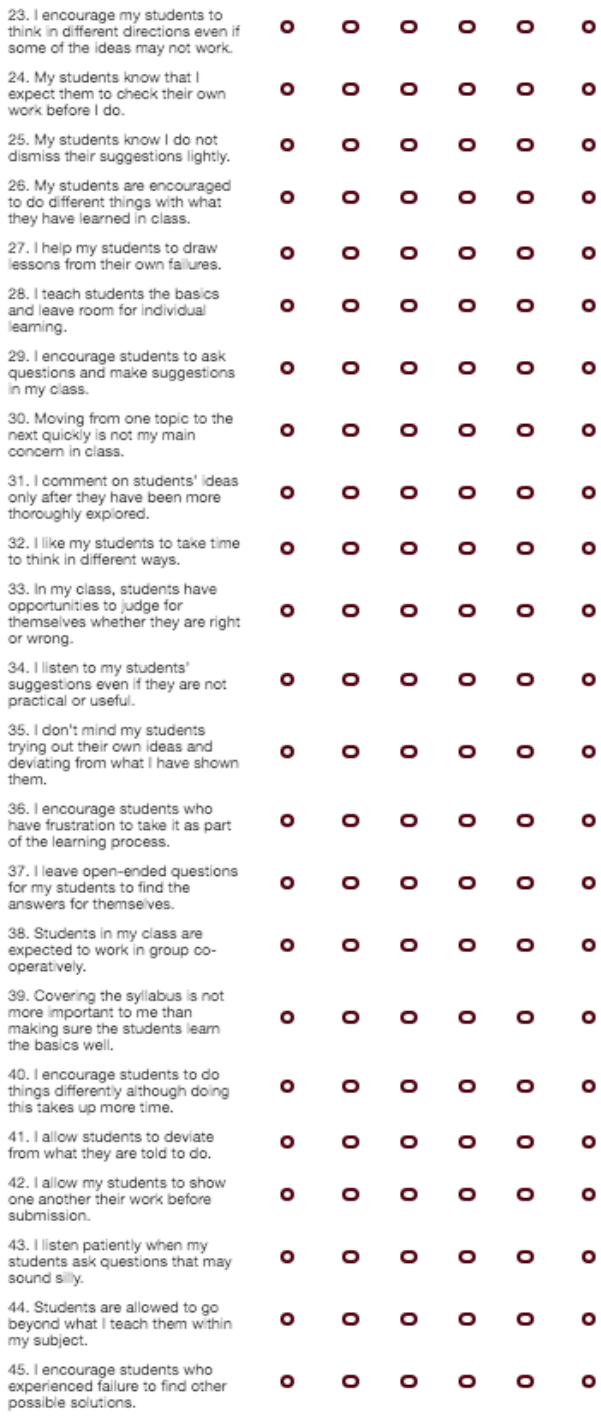
The program that you teach under

Apparel Design	Interior Design
Retail Merchandising	Landscape Design & Planning
Architecture	Product Design
Graphic Design	

Please identify how often you exhibit the following as a teacher, with 1 being Never and 6 being All the time

	Never 1	2	3	4	5	6 All the time
Statements						
1. I encourage students to show me what they have learned on their own.						
2. In my class, students have opportunities to share ideas and views.						
3. Learning basic knowledge and information/ and skills well is emphasized in my class.						
4. When my students have some ideas, I get them to explore further before I take a stand.						
5. In my class, I probe students' ideas to encourage thinking.						
6. I expect my students to check their own work instead of waiting for me to correct them.						
7. I follow up on my students' suggestions so that they know I take them seriously.						
8. I encourage my students to try out what they have learned from me in different situations.						
9. My students who are frustrated can come to me for emotional support.						
10. I teach my students the basics and leave them to find out more for themselves.						
11. Students in my class have opportunities to do group work regularly.						
12. I emphasize the importance of mastering the essential knowledge and skills.						
13. When my students suggest something, I follow it up with questions to make them think further.						
14. I encourage my students to ask questions freely even if they appear irrelevant.						
15. I provide opportunities for my students to share their strong and weak points with the class.						
16. When my students have questions to ask, I listen to them carefully.						
17. When my students put what they have learnt into different uses, I appreciate them.						
18. I help students who experienced failure to overcome it so that they regain their confidence.						
19. I leave questions for my students to find out for themselves.						
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.						
21. My students know that I expect them to learn the basic knowledge and skills well.						
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.						

Appendix F: Online survey



23. I encourage my students to think in different directions even if some of the ideas may not work.	o	o	o	o	o	o
24. My students know that I expect them to check their own work before I do.	o	o	o	o	o	o
25. My students know I do not dismiss their suggestions lightly.	o	o	o	o	o	o
26. My students are encouraged to do different things with what they have learned in class.	o	o	o	o	o	o
27. I help my students to draw lessons from their own failures.	o	o	o	o	o	o
28. I teach students the basics and leave room for individual learning.	o	o	o	o	o	o
29. I encourage students to ask questions and make suggestions in my class.	o	o	o	o	o	o
30. Moving from one topic to the next quickly is not my main concern in class.	o	o	o	o	o	o
31. I comment on students' ideas only after they have been more thoroughly explored.	o	o	o	o	o	o
32. I like my students to take time to think in different ways.	o	o	o	o	o	o
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	o	o	o	o	o	o
34. I listen to my students' suggestions even if they are not practical or useful.	o	o	o	o	o	o
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	o	o	o	o	o	o
36. I encourage students who have frustration to take it as part of the learning process.	o	o	o	o	o	o
37. I leave open-ended questions for my students to find the answers for themselves.	o	o	o	o	o	o
38. Students in my class are expected to work in group co-operatively.	o	o	o	o	o	o
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	o	o	o	o	o	o
40. I encourage students to do things differently although doing this takes up more time.	o	o	o	o	o	o
41. I allow students to deviate from what they are told to do.	o	o	o	o	o	o
42. I allow my students to show one another their work before submission.	o	o	o	o	o	o
43. I listen patiently when my students ask questions that may sound silly.	o	o	o	o	o	o
44. Students are allowed to go beyond what I teach them within my subject.	o	o	o	o	o	o
45. I encourage students who experienced failure to find other possible solutions.	o	o	o	o	o	o

Link to the survey

https://umn.ca1.qualtrics.com/Q/EditSection/Blocks?ContextSurveyID=SV_0PaD4svRKAGktAV

Appendix G: IRB Approval for the Study

UNIVERSITY OF MINNESOTA

Twin Cities Campus

Human Research Protection Program
Office of the Vice President for Research

Room 350-2
McNamara Alumni Center
200 Oak Street S.E.
Minneapolis, MN 55455

612-626-5654
irb@umn.edu
https://research.umn.edu/units/irb

EXEMPTION DETERMINATION

December 4, 2019

Brad Hokanson

612-624-4918
brad@umn.edu

Dear Brad Hokanson:

On 12/4/2019, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Exploring creativity in design education
Investigator:	Brad Hokanson
IRB ID:	STUDY00008159
Sponsored Funding:	None
Grant ID/Con Number:	None
Internal UMN Funding:	Departmental funding : 2909 College of Design graduate funding
Fund Management Outside University:	None
IND, IDE, or HDE:	None
Documents Reviewed with this Submission:	• consent 1 .docx, Category: Consent Form; • HRP-503-Human-Research-Determination-Tasneem kabli , Category: IRB Protocol; • Invitation to Participate in the Interview.docx, Category: Recruitment Materials; • invitation to participate , Category: Recruitment Materials; • Interview questions.docx, Category: Recruitment Materials; • HRP-580 - SOCIAL TEMPLATE PROTOCOL Instructions (1.19.18 -)4 sub.edited (1).docx,

	Category: IRB Protocol; • The CFTIndex questions by Soh.docx, Category: Recruitment Materials;

The IRB determined that this study meets the criteria for exemption from IRB review. To arrive at this determination, the IRB used "WORKSHEET: Exemption (HRP-312)." If you have any questions about this determination, please review that Worksheet in the HRPP Toolkit Library and contact the IRB office if needed.

This study met the following category for exemption:

• (2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) as the following criterion is met: (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation

Ongoing IRB review and approval for this study is not required; however, this determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit a Modification to the IRB for a determination.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the HRPP Toolkit Library on the IRB website.

For grant certification purposes, you will need these dates and the Assurance of Compliance number which is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003).

Sincerely,

Jeffery Perkey
IRB Analyst