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An Examination of the Lived Curiosity Experiences of Traditionally-Aged Freshmen Pursuing and Education Degree

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AN EXAMINATION OF THE LIVED CURIOSITY EXPERIENCES OF TRADITIONALLY
AGED FRESHMEN PURSING AN EDUCATION DEGREE

by

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ABSTRACT

The benefits of being curious continue beyond infancy and early childhood. Curiosity has been linked to academic achievement, memory, and lifelong learning. Yet curiosity type behaviors in academic settings are infrequently observed. This is a concern because some of the students graduating from the educational system will be the teachers responsible for fostering conditions that spark curiosity and exploration for future students. These prospective teachers' lived curiosity experiences will influence their future teaching beliefs and practices. Yet few studies have been conducted that illuminate the lived curiosity experiences of prospective teachers.

The research question that guided this study was, what are the lived curiosity experiences of traditionally-aged freshmen pursuing a degree in education? A phenomenological-based approach was chosen to uncover and examine prospective teachers' prior curiosity-related experiences. Using purposive and criterion sampling methods, 13 participants were recruited from foundational education courses. Rich descriptions of participants' curiosity experiences were obtained by conducting semi-structured interviews composed of open-ended questions. Using Moustakas's modified Stevick-Colaizzi-Keen method, data from the verbatim transcriptions were examined and analyzed. Seven themes were extrapolated from the data that were woven throughout four phases of curiosity. The themes revealed that participants' curiosity experiences included exposure to novel information or novel perspectives that sparked feelings or states of being that were both positive and negative. The participants' curiosity prompted them to explore the objects of their curiosity in independent and social activities that were often supported by individuals who provided autonomy and joined

them in their exploration. Furthermore, every participant shared at least one experience in which

people were the object of their curiosity. People, with whom participants shared a relationship

founded on mutual respect and trust, were also instrumental in cultivating conditions that

encouraged curiosity and exploration. The findings have implications for researchers, K-12

educators, and individuals responsible for preparing prospective teachers who are interested in

exploring further, through research or practice, the potentiality of fostering curiosity.

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I dedicate this manuscript to my daughter, Alisha Weidl. I feel fortunate to share with you a passion for teaching and learning. Thank you for joining me on this journey and inspiring children to follow their curiosity.

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CHAPTER ONE: INTRODUCTION

<u>Introduction</u>

This current study was sparked by a desire to know more about how curiosity is experienced, particularly by prospective teachers, who themselves will one day be responsible for fostering curiosity in their own students. Along with family members, teachers are responsible for providing children with experiences that inspire them to be lifelong learners. Curiosity is the fuel that ignites exploration and propels learning from infancy and continues to benefit individuals' intellectual and emotional well-being throughout their lives (Casey, 2014; Fulcher, 2008; Kang et al., 2009; Mussell, 2013; Park, Peterson, Seligman, 2004; Rowson, 2012; Stumm, Hell, & Chamorro-Premuzic, 2011). Education and business leaders are demanding that schools adequately prepare students to be both innovative and curious. (P21, 2009; Wagner, 2008). Unfortunately, the research indicates that schools have failed to prioritize the fostering of curiosity (Day, 1968; Dillon, 1988; Engel, 2011; Susskind, 1979). The current emphasis on high stakes testing and accountability in K-12 education in the United States appears to have exasperated the problem (Engel, 2011; Reio & Callahan, 2004; Santoro, 2011). As a result, curiosity behaviors have vanished among children as young as kindergarten (Engel, 2009). In order to create the change necessary to bring back curiosity, prospective teachers need to be prepared to implement practices that foster curiosity in their future students. Given that current prospective teachers have spent the majority of their K-12 schooling under this same system that neglected to encourage curiosity (Engel, 2011), there is reason to be worried that they may have few curiosity experiences to bring with them into the teaching profession.

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Influence of Lived Experiences on Teaching Beliefs and Practices

While it is within the scope of teacher preparation programs to ensure prospective teachers have the knowledge and skills needed to implement practices that foster curiosity upon their graduation, substantial research exists that indicates that teachers' lived experiences prior to their own teaching have a significant influence on both their teaching beliefs and the types of practices they will employ (Cam, 2015; Furlong, 2012; Knowles & Holt-Reynolds, 1991; Powell, 1992). In fact, students' lived experiences during K-12 schooling can have a greater influence on prospective teachers than the content they are taught during teacher preparation programs (Cam, 2015; Sexton, 2004).

Upon entrance into teacher preparation programs, prospective teachers bring an accumulation of lived experiences, specifically their experiences as a student observer of teaching and schooling practices (Lortie, 2002). These experiences are often referred to as *apprenticeships of observation* (Lortie, 2002). By the time they graduate high school, prospective teachers have observed thousands of hours of a variety of teaching practices grounded by diverse pedagogical principles that shape their perceptions and beliefs about what it means to be a teacher (Fang, 1996). Consequently, they enter teacher preparation programs not with a blank slate but with a repertoire of teaching beliefs and practices that follow them into their career as a teacher and often show up in the practices they employ (Fang, 1996).

Though recent neurological studies on curiosity have corroborated the academic benefits of being curious, little is known about the lived curiosity experiences of current prospective teachers (Gruber, Gelman, & Ranganath, 2014; Jepma, Verdonschot, van Steenburgen, Rombouts & Nieuwenhuis, 2012; Kang et al., 2009). The scarce data that is available paints a

dismal picture of the extent curiosity practices were part of their K-12 experience (Engel, 2011).

This is concerning given the aforementioned influence of lived experiences on future teaching

beliefs and practices. This study will assist in filling the void in research by obtaining

descriptions of prospective teachers' curiosity experiences prior to their entrance into higher

education. The data will provide insight into the extent curiosity was fostered for them in and

out of school, along with information about the people and context associated with their curiosity

experience.

<div align="center">Problem Statement</div>

Despite the research that demonstrates the benefits of fostering curiosity among students

(Casey, 2014; Fulcher, 2008; Kang et al., 2009; Mussell, 2013; Park, Peterson, Seligman, 2004;

Rowson, 2012; Stumm, Hell, & Chamorro-Premuzic, 2011), prospective teachers may not be

prepared to implement curiosity-fostering practices for their future students. This problem has

negatively impacted both current students and prospective teachers because current students are

not reaping the benefits from practices that foster curiosity and prospective teachers have limited

curiosity experiences to draw upon when they become teachers (Day, 1968; Dillon, 1988; Engel,

2011; Susskind, 1979). This is a problem because, as noted, the lived experiences of prospective

teachers are known to influence their future teaching beliefs and practices, sometimes to a

greater extent than the pedagogical practices they learned from teacher preparation programs

(Cam, 2015; Furlong, 2012; Knowles & Holt-Reynolds, 1991; Powell, 1992). Therefore, it is

important to examine and understand the lived curiosity experiences of prospective teachers so

that those individuals responsible for preparing future teachers (i.e. teacher-educators) can

<div align="center">3</div>

capitalize on those experiences, thus ensuring that future teachers are prepared to foster curiosity in their future students.

The researcher notes that it would be an overstatement to conclude that prospective teachers have not had any curiosity experiences: there is scant research indicting one way or another. While a majority of prospective teachers' time prior to entering higher education was spent in schools observing teachers, other contexts and adults outside of school may have played an influential role in fostering prospective teachers' curiosity (Greenwalt, 2014). The fact is that too little is known about prospective teachers' lived curiosity experiences, and thus little is known about how their experiences will impact their future students.

The lack of information about prospective teachers' curiosity experiences prior to entering teacher preparation programs is a problem because research indicates their prior experiences influence their future teaching beliefs and practices. This study tackles this complex problem of practice by employing tenets of phenomenology to gather and analyze data from individuals who have first-hand knowledge of the experience of being curious: traditionally-aged freshmen pursing a degree in education. The goal is to gain a thorough understanding of how prospective teachers perceive and gain meaning from their lived curiosity experiences. Therefore, in depth interviews will be employed to understand the extent of prospective teachers' curiosity experiences in and out of school, the influential factors associated with their curiosity experiences, and most importantly the meaning they attach to those experiences.

Purpose

The purpose of this study is to examine and understand the lived curiosity experiences of traditionally-aged college freshmen pursuing an education major. Once examined and better understood, the knowledge gained can be used to inform higher education teacher preparation programs, support the current body of research on curiosity, and set the stage for future research.

Significance

The current research on the lived curiosity experiences of future teachers is significant for several reasons. First, the data collected will add to the current body of research on curiosity. The empirical research on curiosity is scant and frequently outdated, especially research situated in the context of education (Jirout & Klahr, 2012). Second, the data will increase the current body of knowledge related to the extent practices that foster curiosity, both inside and outside of the school setting. As was noted, it appears curiosity is not fostered in schools (Engel, 2011). However, the data is limited and further research is needed. Third, rather than learning about curiosity through first person accounts of the phenomena, researchers have historically relied on individuals' responses to surveys to gain quantifiable data about their curiosity experiences. The rich descriptions of curiosity experiences shared by participants in this study will provide a more complete understanding of the factors that influence curiosity. Finally, the findings could inform teacher preparation programs by providing greater understanding of prospective teachers' lived curiosity experiences and the meaning those experiences have had for them. Understanding students' background experiences related to curiosity may assist those who are responsible for overseeing teacher preparation programs in making adjustments to their current program that are

apt to increase the likelihood that prospective teachers will employ practices that foster curiosity in their future students.

<div align="center">Research Questions</div>

Several research questions were selected after consulting with a variety of professional resources. First, an expert in the area of qualitative research and phenomenology was consulted. Following his direction, the sub-questions where developed and then analyzed to ensure that the answers would lead to a deeper understanding of prospective teachers' lived curiosity experiences. Next, the questions were compared to questions found in Creswell (2013). Finally, the decision was made that a single overarching question (RQ1) and three sub-questions (RSQ1-3) would meet the purpose of this phenomenological study. These questions are as follows:

RQ1:   What are the lived curiosity experiences of traditionally-aged freshmen pursuing a degree in education?

RSQ1-1:   To what extent have they experienced curiosity?

RSQ1-2:   What factors influenced their experiences?

RSQ1-3:   What meaning do the experiences hold for them?

During the consultation process, the first sub-question resulted in the most contention and debate because it initially appeared to lend itself more to a quantitative rather than a qualitative study. However, it was argued that one of the unknowns going into this study was the extent that curiosity has been fostered for prospective teachers in and out of school. Although it is not the intent of this question to quantify prospective teachers' curiosity experiences, the stories and descriptions they share are likely to provide insights into the extent that curiosity was

experienced by them in and out of school. An answer to sub-question two is expected to provide a comprehensive description and understanding of prospective teachers' curiosity experiences. Finally, sub-question three will provide insight into the meaning prospective teachers attach to their curiosity experiences, which is at the heart of a phenomenological study.

Research Approach

The current study incorporates a qualitative design guided by the tenets of phenomenology. Phenomenology was chosen because phenomenology places emphasis on understanding the phenomena under study from the perspective of individuals who have experienced it (Creswell, 2013). This is in contrast to approaches that analyze and interpret data based on a theoretical framework. The phenomenologist researcher extrapolates data from participants' rich descriptions of their lived experiences by typically conducting long or multiple semi-structured interviews (Creswell, 2013. The format of the interview allows participants to expand on their descriptions and for the researcher to prompt for clarification as needed (Creswell, 2013). The goal of the interview is to elicit stories from participants rather than prompt them to make judgments or inferences about their experiences (Creswell, 2013). The value of the data lies in the essence or meaning individuals attach to their lived experiences (Moustakas, 1994). It is believed that phenomenology is the best fit for this study because it provides a philosophical rather than a theoretical umbrella that emphasizes the benefits of understanding the essence of the phenomena as perceived by those who experience it (Moustakas, 1994). The perceptions of prospective teachers will shed light on the meaning they

attach to their curiosity experiences and provide insight into how their experiences might influence their future teaching beliefs and practices.

Terminology

In order to assist the reader in understanding the complexity of the construct of curiosity and to aid in making meaning of prospective teachers' lived curiosity experiences, a glossary of terms is provided below:

1. *Apprenticeship of observation:* the phenomenon whereby preservice teachers spent thousands of hours observing and evaluating teachers in practice during their time as schoolchildren (Lortie, 2002).

2. *Breadth curiosity:* an orientation to seeking varied and changing experiences (Ainley, 1987, p. 55).

3. *Collative variables:* elements appearing simultaneously in different sectors of a stimulus field or elements that have been perceived at different times; examples include novelty surprisingness, incongruity, complexity, variability, and puzzlingness (Berlyne, 1966, p. 30).

4. *Curiosity:* A desire to know, to see, or to experience that motivates exploratory behaviour directed towards the acquisition of new information (Litman, 2005, p. 793).

5. *Deprivation type curiosity:* reducing uncertainty and eliminating undesirable states of ignorance (Litman, 2005, p. 1586).

6. *Depth curiosity:* an orientation towards exploring and investigating new objects, event, and ideas (Ainley, 1987, p. 55).

7. *Diversive curiosity:* a general seeking of stimulation that is closely related to boredom (Loewenstein, 1994, p.77) or the need to seek new experiences or extend one's knowledge into the unknown (Day, 1968, p. 37).

8. *Epistemic curiosity:* individual differences in seeking out opportunities for intellectual engagement, acquiring facts or knowledge, or simply the drive to know (Berlyne, 1954, p.187)

9. *Information gap:* curiosity as arising when attention becomes focused on a gap in one's knowledge (Loewenstein, 1994, p.87)

10. *Inductive approach:* curiosity associated with pleasant feelings; the induction of which is rewarding

11. *Interest:* a relatively enduring predisposition to reengage with particular content (Hidi 2006, p. 70)

12. *Interest type curiosity:* the anticipated pleasure of new discoveries (Litman 2005, p.1586)

13. *Intrinsic motivation:* the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and learn (Ryan & Deci, 2000, p. 70)

14. *Perceptual curiosity:* a drive that is aroused by novel stimuli and reduced by continued exposure to these stimuli (Berlyne, 1954, p. 180)

15. *Reductive approach:* curiosity associated with feelings of uncertainty, the reduction of which is rewarding (Litman, 2005).

16. *Specific curiosity:* an intrinsically motivated desire for a specific piece of information (Loewenstein, 1994, p. 87) or aroused state of an organism when confronted by an

ambiguous or unclear stimulus and which may result in specific exploration (Day, 1968, p. 37)

17. *State curiosity:* curiosity in a particular situation (Loewenstein, 1994, p. 78)

18. *Trait curiosity:* a general capacity or propensity to experience curiosity (Loewenstein, 1994, p. 78)

Organization of the Dissertation

The following overview provides a summary of the chapters that follow. The chapters are intended to build on one another, taking the reader on a journey that begins with an introduction of the problem and rationale and ends with potential implications and recommendations. Throughout the journey, the phenomenon of curiosity will be examined, analyzed, and discussed.

Chapter one provided an overview of the context of the problem followed by the purpose of the study and research questions. It concluded with an overview of the research methods and a glossary of relevant terms. Chapter two will discuss and review the relevant literature. The literature review includes the conceptualization of curiosity, benefits of being curious, state of curiosity in schools, factors related to curiosity, and the influence of lived experiences on teaching beliefs and practices. The literature review provides support for the necessity of the study and methodology choice. Chapter three will present the research design, methodology, and actions taken to establish and maintain trustworthiness and ends with a description of the researcher's perspective, assumptions, and expectations. Chapter four will present the research findings by providing a general description of the research participants, the themes that were

identified, and a composite of the themes abstracted from the data. Chapter five will serve as the

conclusion of the study, containing a summary of the findings, a discussion of the findings and

implications, and recommendations for continued research.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

Introduction

The purpose of this study is to examine and understand the lived curiosity experiences of traditional freshmen pursuing an education major so that the knowledge gained can be used to inform higher education teacher preparation programs, support the current body of research on curiosity, and set the stage for new research.

Rationale for Topics

The topics included in this review of the literature were selected after multiple readings of numerous studies on curiosity and several conversations with faculty and dissertation committee members. The topics include: conceptualization of curiosity, benefits of being curious, current state of curiosity in schools, factors that influence curiosity, and the influence of lived experiences on teacher beliefs and practices. This first section begins with a review of the literature by researchers in the field of curiosity whose work contributed to a conceptual understanding of curiosity. This foundational knowledge is needed to develop an understanding of curiosity, refine the research questions, and assist in interpreting the data gathered from interviewing prospective teachers. A study to understand prospective teachers' curiosity experiences would not be warranted if there were no benefits to being curious. Therefore, the second section provides a review of the benefits of being curious throughout an individual's lifespan. The third section describes the state of curiosity in schools and is followed by factors

that influence curiosity: specifically the role of significant others, the influence of environmental elements, and the connection to motivational theories. The final section examines how teachers' identities and teaching practices are shaped by their lived experiences, particularly during their time in school. This research makes the case for understanding the influence of prospective teachers' lived curiosity experiences on their future teaching beliefs and practices.

<center>Conceptual Understanding of Curiosity</center>

<u>Introduction</u>

Unlike this current study in which the goal was to understand and examine curiosity from first person accounts of participants' lived experiences, the conceptual studies that follow primarily draw information about curiosity from experientially contrived studies or self-reported measures. While rich descriptions of curiosity experiences will likely produce more vivid descriptions of curiosity, conceptual studies provided valuable foundational knowledge about the experience of being curious.

Curiosity is a popular topic of interest among the general public. Enter the word "curiosity" into the search field of Google.com and you will find thousands of links to websites promoting the benefits of being curious, along with suggestions for fostering curiosity in others. However, curiosity has received little attention among researchers (Kashdan, Rose, & Fincham, 2004; Loewenstein, 1994). In contrast to science and psychology databases, curiosity was not listed as a stand-alone subject in educational databases. The reasons why the phenomenon of curiosity has not been thoroughly studied, specifically in education, can only be inferred. One explanation may lie in the challenge of conceptualizing what it means to be curious.

Even among researchers, there has been a lack of consensus regarding a workable definition of curiosity (Jirout, & Klahr, 2012; Loewenstein, 1994). Curiosity was often referred to as a somewhat stable personality trait, varying in extent among individuals (Loewenstein, 1994). However, curiosity was also referred to as a state or condition that sparked individuals' desire to know more (Loewenstein, 1994). Additionally, different types of curiosity, different labels, and different explanations of the causes have been espoused (Loewenstein, 1994). Furthermore, researchers often referred to the characteristics of curiosity in studies on motivation but neglected to explicitly label the construct as curiosity (Kashdan & Fincham, 2012). Lastly, several tools have been developed that vary in how they define curiosity and the types of curiosity they measure, making it difficult to replicate or compare findings among research studies (Jirout & Klahr, 2012). The multidimensional nature of curiosity has made it difficult to define, measure, and study (Jirout & Klahr, 2012).

Definitions of Curiosity

The following definitions of curiosity were derived from research published in peer-reviewed journals. The various definitions are shared to demonstrate the complexity and diversity of meanings assigned to curiosity.

Curiosity is:

- "An intrinsic motivation to learn" (Gruber, et al., 2014, p. 486).

- "The urge to know more" (Engel, 2011, p. 627).

- "The desire to seek information and knowledge" (Cavojova & Sollar, 2007, p.89).

- "A drive which is reduced by the reception and subsequent rehearsal of knowledge" (Berlyne, 1954, p. 180).

- "A desire to know, to see, or to experience that motivates exploratory behaviour directed towards the acquisition of new information" (Litman, 2005, p. 793).

- "The recognition, pursuit, and intense desire to explore novel, challenging, and uncertain events of novelty and challenge" (Kashdan & Silvia, 2009, p. 291).

And finally, the most comprehensive definition of curiosity proposed by Arnone, Small, Chauncey, and McKenna (2011):

> Curiosity viewed episodically as a desire for new information or experience afforded by new media environments and includes a trigger [stimulus characterized by uncertainty] or multi-trigger scenario evoked by dynamic media environments; reaction [which may involve any number of new media skills such as multi-tasking, distributed cognition, collective intelligence]; and resolution [satisfied/not satisfied based on the participatory collaborative] (p.185).

Based on the definitions proposed, curiosity is an intrinsic motivation, a desire, an urge, or a drive, none of which can be directly observed. Curiosity is often inferred through the observation of behaviors. And while the focus or intent of curiosity appears to be to seek information or knowledge, only the last definition requires the inclusion of an action and resolution. Due to the symbolic relationship between curiosity and exploration, the trigger and reaction are often grouped together and referred to as curiosity. Therefore, it seems vital to understand both in order to examine and make sense of the curiosity experiences of the individuals participating in this study.

<u>Trigger and Manifestation</u>

The definition of curiosity can be subdivided into two parts: the trigger that sparks curiosity and the action in which curiosity is manifested. Even though curiosity is frequently referred to as a thirst or hunger, the trigger that sparks curiosity is generally accepted to be influenced by environmental stimuli. Commonly agreed upon characteristics of environmental stimuli, (collative variables) that spark curiosity are novelty, surprise, incongruence, complexity, and uncertainty (Berlyne, 1966; Loewenstein, 1994; Piaget, 1969).

Most noted and cited for his contributions to understanding the environmental triggers that spark curiosity is D. E. Berlyne. Berlyne (1966) conducted several experiential studies in which he examined and measured the eye movements of individuals as they were exposed to pictures of visual objects. When participants were shown a series of pairs of animal pictures, individuals spent less amounts of time inspecting recurrent patterns and greater amounts of time inspecting novel or changing patterns. Similarly, when individuals were presented with a series of pictures that ranged in complexity, they spent more time fixated on the highly complex patterns. Therefore, Berlyne reasoned curiosity is sparked by stimuli that are novel or complex (Berlyne, 1966).

Loewenstein (1994) acknowledged that novel and complex stimuli can trigger curiosity but placed greater emphasis on the cognitive structures that motivate individuals to be curious. He argues that curiosity arises due to a perceived gap in knowledge. Therefore the trigger is not solely novel information but an awareness of incomplete information. In other words, it is virtually impossible for individuals to be curious about a phenomenon that they have no knowledge exists (Loewenstein, 1994).

While complex and ambiguous stimuli can ignite curiosity, stimuli that are perceived as too complex or ambiguous may inhibit curiosity by producing states of anxiety, and stimuli that are too surprising, novel, or strange may ignite states of fear or flight (Day, 1982). Additionally, knowledge gaps that are too wide may result in feeling overwhelmed and cause individuals to be unmotivated to pursue information that would reduce their gap in knowledge (Loewenstein, 1994).

Once curiosity is triggered, it sets into motion an action or series of actions (Berlyne, 1966). The actions, or manifestations of curiosity, are the effects of curiosity. Manifestations describe the method individuals' employ to explore the phenomenon that sparked their curiosity. Berlyne (1966) defined exploration as an "approach and sustained contact" (p. 30). These exploratory behaviors tend to be observable and often come to mind when describing a curious individual. Commonly agreed upon manifestations of curiosity are: moving towards a stimulation source, playing with the source, examining or manipulating the source, questioning, discussing, debating, and researching (Arnone et al., 2011; Berlyne, 1966; Day, 1982).

However, curiosity may be manifested in ways that are not as easily observed, especially when motivated by conceptual conflict (Loewenstein, 1994). While it is fairly easy to characterize a child who asks a plethora of questions as curious, as individuals get older cognitive activities become a means for manifesting curiosity (Arnone et al., 2011). These in the head activities associated with reasoning, if not shared with others, may not be visible. Thus, it is possible to have a room full of curious individuals (individuals who desire knowledge) but not know it because they do not pursue knowledge in ways that can be observed.

State and Trait Curiosity

An additional challenge to studying curiosity was deciding on whether to examine the construct as a trait or state. Curiosity, as a trait, refers to a personality characteristic or disposition of individuals to experience curiosity, whereas state curiosity refers to a particular situation in which curiosity is evoked (Naylor, 1981). Research studies focusing on trait curiosity have resulted in a number of multi-item scales for measuring the extent of individuals' curiosity (Kashdan et al., 2004; Litman & Jimerson, 2004; Loewenstein, 1994). The information gathered from the scales was often used to either make comparisons between individuals who differ demographically or to identify individuals high in trait curiosity so that correlations could be made between curiosity and other constructs (Loewenstein, 1994). As a result of the focus on trait curiosity, research has revealed more about the characteristics of highly curious individuals and less about individuals who appear to be minimally curious.

State curiosity, on the other hand, has been more difficult to measure than trait curiosity because it requires catching individuals in the moment of being curious or creating contrived situations in which curiosity is triggered (Loewenstein, 1994). Both situations create a challenge because of individual differences in triggers that spark curiosity. However, given the reciprocal nature of trait and state curiosity, it is likely individuals who experienced frequent episodes of state curiosity would increase their overall level of trait curiosity (Kashdan et al., 2004; Litman, 2005).

Types of Curiosity

Understanding the need to conceptualize curiosity further and explain differences in its derivation, Berlyne (1960) proposed two categories of curiosity: perceptual and epistemic.

Perceptual curiosity, observed primarily in animals, is aroused by a novel form of stimuli and diminished by continual exposure, whereas epistemic curiosity is observed in humans by their desire to seek knowledge (Berlyne, 1960). Berlyne further delineated epistemic curiosity into diversive and specific exploratory behaviors: diversive curiosity applying to behaviors stimulated by novel or intriguing factors and specific curiosity applying to behaviors triggered by an unsettling feeling satisfied through exploration of the specific phenomenon that initially triggered the desire (Berlyne, 1960). Although there are salient differences between diversive and specific curiosity, the two types of curiosity are mutually supportive of one another (Litman, 2008; Loewenstein, 1994).

In differentiating between specific and diversive curiosity, Berlyne (1960) set the stage for other researchers to compare, contrast, and measure different types of curiosity. The various labels used to differentiate between the types of curiosity have resulted in a lack of shared language between researchers, and thus created challenges related to making comparisons and finding similarities across research (Jirout & Klahr, 2012). While the terms used to label the different types of curiosity vary, enough similarities exist to warrant grouping them together based on how curiosity is manifested. The first group includes the terms diversive, breadth, interest, and stretching. These terms tend to describe curiosity behaviors observed in someone who seeks new experiences and who has many interests. The second group includes the terms specific, depth, deprivation, information gap, and embracing. These terms tend to describe curiosity behaviors observed in someone consumed in exploration or searching behavior. The table below identifies the prominent researcher and the label they believe best describes the different types of curiosity.

Table 1. Research on Curiosity

Researcher	Seeks various forms of stimuli, has many broad interests	Explores or searches information on a specific topic, has single or narrow interests
Langevin (1971)	Breadth	Depth
Berlyne (1960)	Diversive	Specific
Loewenstein (1994)		Deprivation
Litman & Jimerson (2004)	Interest (I-type)	Deprivation (D-type)
Kashdan et al. (2009)	Stretching	Embracing

As indicated in the above chart, only Loewenstein believes one type of curiosity exists. In contrast to the majority of researchers, he theorized that curiosity was solely caused by a feeling of deprivation due to a gap in information manifested by behaviors that diminish or close the gap (Loewenstein, 1994). Although he conceded that individuals often seek a variety of stimulating experiences, he does not agree with researchers who believe these behaviors qualify as curiosity (Loewenstein, 1994).

Causes: Reduction versus Induction

Due to the challenges inherent in defining and conceptualizing curiosity, the majority of earlier researchers chose to study what causes curiosity (Loewenstein, 1994). This research has led to several overlapping theories about curiosity. While there is much agreement on the characteristics of the stimuli that evoke curiosity, there was less agreement on how the individual and stimuli interact to prompt the desire to know more. Several explanations or theories have

been proposed that tend to attribute the cause to either a reductive or inductive reaction (Litman, 2005). Researchers who take a reductionist stance believe a negative or uncomfortable feeling evokes curiosity and the aim is to reduce or diminish the feeling through exploration. Researchers who take an inductive stance focus on the positive feeling induced by curiosity and ensuing exploratory behaviors (Litman, 2005). Although the majority of researchers argued for a reductive rather than inductive explanation of the underlying causes, both stances tend to agree that regardless of the emotion or inner state of being initially evoked by exposure to the stimuli, curiosity can be a satisfying and rewarding experience.

Several theories have been proposed that provide insight into what triggers curiosity. The theories are: drive, optimal arousal, incongruence, information gap, and interest/deprivation. A brief description of each theory follows.

Drive Theory

During the earliest 20th century, curiosity was conceptualized as an internal drive like hunger, thirst, and sex (Loewenstein, 1994). Even today, some traditional psychologists adhere to a drive theory of curiosity, believing curiosity is a primary need for human survival Drive theory of curiosity portrays curiosity as a naturally occurring urge sparked by internal stimuli that must be satisfied in a very similar manner to how people satisfy their hunger by eating. Although most researchers today believe curiosity is sparked by external stimuli, terms such as devour, thirst, hunger, craving, and appetite are still used to demonstrate the intensity of feeling that curiosity induces (Loewenstein, 1994).

Optimal Arousal

Berlyne (1960) also conceptualized curiosity as a drive but diverged from traditional drive theorists by emphasizing the role of external rather than solely internal stimuli. Berlyne argued that curiosity is experienced when individuals encounter stimuli of moderate complexity that produce feelings of uncertainty and tension. The feeling of uncertainty causes the individual to explore the stimuli that ignited the feeling, thereby reducing the level of uncertainty and tension. Berlyne was one of the first to introduce the idea that curiosity could also be aimed at acquiring knowledge, which he termed epistemic behavior (Berlyne, 1966; Loewenstein, 1994). He proposed that humans prefer states of optimal arousal and insisted that boredom, along with induced levels of anxiety, are represented by high arousal. The idea that boredom could be considered a state of high arousal was negated by other theorists but Berlyne insisted that boredom works through a system of high arousal and that the goal of exploration is to return to a state of homeostasis (Berlyne, 1966; Loewenstein, 1994).

Day (1982), a colleague of Berlyne, created a model to demonstrate the effect curiosity has on behavior changes and the activation level of an organism. Day's conceptual model identified three zones: zone of curiosity, zone of relaxation, and zone of anxiety. The zone of curiosity represents optimal arousal levels that are neither too high nor too low. In this zone, individuals are prone to exploration, excitement, and interest. In contrast, in both the zone of relaxation (too little arousal) and zone of anxiety (too much arousal) individuals are disinterested and inefficient. Additionally, avoidance and defensive behaviors are common in the zone of anxiety. Like Berlyne, Day (1982) believes the goal of exploration is to reduce feelings of uncertainty.

Incongruence

Most noted in understanding childhood behavior is Jean Piaget. Piaget believed that exploration was the result of a child's attempt to resolve cognitive disequilibrium (Piaget, 1969). Disequilibrium occurs when a child, through exploration, encounters new phenomena requiring assimilation into his or her existing framework of knowledge. Disequilibrium is caused by exposure to stimuli that is complex enough to spark an individual to move towards exploration and thus reduce the incongruity. During low levels of discrepancy, new information is assimilated effortlessly, but during high levels of discrepancy information is ignored. Sustaining congruence is not possible because children are in a constant state of exploring and learning (Piaget, 1969).

The two theories, incongruence and optimal arousal, have in common the idea that curiosity can be illustrated by an inverted U-shape. When complexity is at a low point, attending to complex stimuli is sought but peaks when complexity rises to a high level. At this point, the goal is to decrease uncertainty and return to a state of homeostasis (Day, 1968).

Information Gap

Loewenstein (1994) proposed a theory he termed information gap. He conceptualized curiosity as a feeling of deprivation that occurs when attention is given to the gap that exists between existing knowledge and desired knowledge. Curiosity is fueled by a desire to fill in the missing information and reduce or eliminate feelings of deprivation (Loewenstein, 1994). However, too small of a gap might result in complacency or boredom, whereas too large of a gap might result in anxiety or withdrawal. This feeling of deprivation increases as the individual moves closer to closing the gap. To illustrate this point, Loewenstein (1994), prompted readers

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to consider a person who knows only 3 out of 50 state capitals compared to a person who knows 47 out of 50 capitals. The first person likely focuses their attention on the three known capitals with little motivation to close the gap. However, the second person focuses their attention on the three unknown capitals and is more likely to attend to closing the gap by pursuing the missing information (Loewenstein, 1994). Equally as important to sparking curiosity is individuals' cognition that they are missing information (Loewenstein, 1994). In other words, individuals who believe they know all there is to know about a specific topic will not exhibit curiosity to know more. Therefore, continuous exposure to new phenomena or new ways of perceiving phenomena is essential to being curious (Loewenstein, 1994).

The theories described above have in common the idea that too much or too little of something can thwart curiosity. However, they differ in their stance on whether curiosity is fueled by a desire to fulfill unmet needs, seek congruence, reach an optimal level of arousal, or fill a gap in knowledge. The next two theories that will be shared tend to place more emphasis on the positive feelings rather than negative feelings that are aroused and produced by curious states.

<u>Interest and Deprivation</u>

Litman and Jimerson (2004) argue that what causes curiosity is not one-dimensional. Their interest/deprivation (I/D) model of epistemic curiosity (EC) maintains that both a reduction and induction model of curiosity best explains the dual dimensions of epistemic curiosity. Like Berlyne, they identified two types of epistemic curiosity, which they refer to as deprivation (D) and interest (I). Similar to Loewenstein's information gap theory, Litman and Jimerson (2004) believe curiosity is aroused by a negative feeling of uncertainty when individuals' feel they are

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lacking or deprived of information. They refer to this as Deprivation type Epistemic Curiosity (D-type EC). On the other hand, curiosity can also be aroused by positive feelings of interest, ignited by the anticipation of learning new information. They refer to this as Interest type Epistemic Curiosity (I-type EC). Later, Litman extended the concept by tentatively proposing a theory of curiosity he describes as "wanting and liking" that takes into consideration both D-type and I-type EC (Litman, 2005). Wanting and liking, he suggests, are symbiotic processes yet are derived from different physiological mechanisms. Whereas wanting tends to ignite high levels of intense desire, liking ignites feelings of extreme pleasure. The interplay between the two systems is involved in stimulating curiosity and the subsequent reward when curiosity is satisfied (Litman 2005).

Positive Psychology

Finally, Kashdan, Rose, and Fincham (2004) prefer an inductive approach for conceptualizing curiosity, arguing that curiosity is clearly a pleasurable experience that individuals pursue. Their theoretical argument contrasts with other theorists who draw a relationship between curiosity and negative feelings. Rather than emphasizing the affect associated with curiosity, their model contends that curiosity "facilitates positive subjective experiences and personal growth opportunities" (p. 302). Their explanation of curiosity differs from many of the theorist because it is derived from the viewpoint of positive psychology. Additionally, their model differs from researchers who focus on external stimuli and neglect internal stimuli as a means for activating curiosity. They propose that internal novelty and challenge can activate curiosity and is evidenced by individuals' desire for reflection and introspection (Kashdan et al., 2004).

In summary, curiosity has been conceptualized as a desire to reduce an uncomfortable feeling or induce a pleasurable feeling. Berlyne (1960) and Day (1982) attribute curiosity to a desire to reach homeostasis, a state that is exemplified by a moderate level of arousal. Piaget (1969) attributes curiosity to a desire to seek congruence by assimilating new knowledge with existing knowledge. Loewenstein (1994) proposes that curiosity occurs when a gap in knowledge exists, and Litman (2005) argues that curiosity is activated by both a desire to reduce negative feelings and a desire to induce positive feelings. Finally, Kashdan et al. (2004) prefers to focus on the positive attributes associated with curiosity.

Relationship to Interest

Researchers have struggled to differentiate between interest and curiosity. Curiosity, in some views, is virtually synonymous in meaning with the construct of interest (Kashdan & Fincham, 2004). Yet most empirical studies have treated them as conceptually unique constructs, choosing to study one or the other. Certainly, the two constructs share a reciprocal relationship.

This reciprocal nature of curiosity and interest makes disentangling the two constructs a challenge and often prompts which comes first, interest or curiosity (Grossnickel, 2016). When curiosity is sparked, interest generally enters the dynamic. While curiosity may eventually be resolved, interest in the subject may continue. However, curiosity that is not resolved can lead to a lack of interest.

Curiosity and interest also differ in the role knowledge plays. Curiosity sparks a desire or urge for knowledge. While the same may be true in some instances for interest, curiosity is

dependent on an optimal level of knowledge (Loewenstein, 1994). This optimal level has been described as the zone of curiosity (Day, 1982). Curiosity is diminished when the gap in knowledge is too large or too small (Loewenstein, 1994). Interest does not rely on an optimal level of knowledge to exist, although some studies have found that interest in a particular topic increases in tandem with knowledge (Grossnickel, 2016).

Additionally, curiosity, by most researchers' accounts, is a multidimensional construct that encompasses two different types of curiosity: breadth and depth. Both breadth curiosity and interest are associated with a positive feeling or desire, which may lead to increased attention (Ainley, 1987; Litman, 2008). In contrast, depth curiosity is typically associated with an uncomfortable feeling or urge (Loewenstein, 1994). Depth curiosity has the potential to induce a positive feeling but not until the gap in knowledge is filled. While the primary goal of interest is enjoyment or attention, the primary goal of curiosity, particularly depth curiosity, is exploration aimed towards reducing uncertainty and filling a knowledge gap (Ainely, 1987; Litman, 2008).

Lastly, curiosity is typically thought of in terms of a dispositional trait as noted when describing a child as curious, whereas interest is distinguished from a personality trait (Grossnickel, 2016). Overlap between the constructs frequently occurs when references are made to curiosity as a state rather than a trait (Grossnickel, 2016). For example, both state curiosity and interest can wane over time and be specific to a particular domain (Grossnickel, 2016).

It is clear that more research must be conducted to clarify similarities and differences between interest and curiosity. Certainly, if researchers are confused and struggle to differentiate between curiosity and interest, prospective teachers are likely to do the same.

<div align="center">Benefits of Being Curious</div>

The benefits of being curious are numerous. Curiosity is responsible for motivating exploration in infants and young children, positively influencing academic achievement, providing greater satisfaction in career and life, and increasing the quality and quantity of life in the elderly. The benefits of fostering curiosity span a lifetime (Kang et al., 2009; Mussell, 2013 Piaget, 1969; Swan & Carmelli, 1996; von Stumm, Hell, & Chamorro-Premuzic, 2011).

Infants and Young Children

It is generally accepted that infants are born with an innate desire to explore their environment (Jirout & Klahr, 2012). The motivation that sparks this desire is commonly referred to as curiosity (Loewenstein, 1994; Jirout & Klahr, 2012). Curiosity is cultivated by environmental stimuli characterized as novel, complex, or surprising, and that presents an appropriate amount of uncertainty or doubt (Berlyne, 1954; Loewenstein 1994). Certainly, as soon as infants are separated from the womb, they find themselves immersed into an environment in which everything is new - new sounds, textures, and movements capture their attention. Their initial lack of physical mobility limits their exploratory behaviors, but as early as two months of age infants demonstrate an interest in using their hands and objects to explore stimuli within a reaching distance (Lobo & Galloway, 2012). As soon as they are developmentally ready, they learn that they can initiate exploration by rolling, crawling, and eventually walking to the stimulus that they want to explore (Kretch, Franchak, & Adolph, 2014). Their curiosity can often get them in trouble, such as when they dump a container of folded laundry on the floor or pull on the cat's tail. However, curiosity also serves them well by teaching them about cause and effect relationships (Sobel & Kirkham, 2006). During birth to

three years of age, the neuron synapses in the brain grow at a faster rate than any other time in a human's development (Nowakowski, 2006). This growth of cognitive function is believed to be a result of building schemas that multiply and increase in complexity through exploration (Piaget, 1969). Thus, curiosity and exploration interact and propel a cycle of learning, evidenced by children's ever increasing language ability.

Role of Questions

Even prior to the development of language, children as young as a year old demonstrate the ability to "question" and seek information by using gestures, expressions, and beginning vocalizations (Chouinard, 2007). As language develops, curiosity is responsible for three and four year olds' plethora of questions that drive parents crazy but support young children's development of syntax and higher order thinking (Chouinard, 2007). By the time preschool children enter formal schooling, they have developed the ability to form questions that require analysis and posit questions directed towards existential topics (Chouinard, 2007). Their curiosity primes them for a future of academic learning.

Academic Achievement

As children develop more sophisticated forms of language, their curiosity prompts more sophisticated means of exploration, shifting from tactile exploratory behaviors to cognitive activities (von Stumm et al., 2011). Von Stumm et al. (2011) defined these cognitive activities as intellectual curiosity, which are expressed by "tendencies to seek out, engage in, enjoy, and pursue opportunities for effortful cognitive activity" (p. 577).

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As a result of a meta-analysis of research to understand individual differences in academic performance, intelligence and effort, two well-known factors correlated with high achievement in academics, were found to be joined by a third factor: intellectual curiosity (von Stumm et al., 2011). While intelligence held greater weight than curiosity and effort alone, curiosity and effort together equaled intelligence as precursors to academic achievement (von Stumm et al., 2011). Evidence of this relationship between high academic achievement and curiosity was corroborated in a study by Lounsbury, Fisher, Levy, & Welsh (2009). Students who self-reported being highly curious excelled academically and demonstrated intrinsic desires to learn. Strong academic achievement was also correlated with curiosity among younger students. Fifth grade students who participated in instruction aimed at instigating controversy were noted as having higher states of curiosity and academic achievement compared to peers who did not participate (Lowry & Johnson, 1981). This was also true for fourth grade students who participated in inquiry. When compared with the control groups, the inquiry group demonstrated higher levels of curiosity and academic achievement (Mourad & Hadi, 2006). While the research on the relationship between curiosity and academic achievement is scarce and often dated, recent neurological studies validate the correlation between academic achievement and curiosity.

Neurological Studies

In contrast to the popular phrase, "curiosity killed the cat," several recent studies found curiosity feeds the brain. Given the advances in understanding how the brain functions, researchers have taken an interest in examining the neurological underpinnings related to curiosity. Kang et al. (2009) used functional magnetic resonance imaging to track processes

in the brain while individuals responded to trivia questions. They found curiosity increased

individuals' ability to recall information by activating and stimulating regions in the brain

associated with anticipation and memory (Kang et al., 2009). In a similar study, Gruber,

Gelman, & Ranganath (2014) sought to determine the relationship between curiosity and the

learning of interesting information related to anticipatory brain activity. They too asked

participants to respond to trivia questions and found evidence complementing the finding of

Kang et al. (2009). Curiosity enhances learning and memory, at least in part, through increased

dopaminergic modulation of hippocampal activity (Gruber et al., 2014). Additionally, the

findings were extended by measuring the extent curiosity helped individuals recall incidental

information by inserting unknown human faces between the time participants' curiosity was

sparked by the trivia question and the time participants were rewarded with the answer (Gruber

et al., 2014). The findings indicated that high curiosity states supported individuals' ability to

remember not only interesting information but also incidental information (Gruber et al., 2014).

While similarities exist between the two studies, Gruber et al. (2014) contended that their study

examined how curiosity influences new learning specifically related to anticipation, whereas

Kang et al. (2009) examined the interaction of prior knowledge, brain activity, and curiosity.

Lastly, Jepma, et al. (2012), used functional magnetic resonance imaging to study

curiosity, but rather than utilizing trivia questions to activate curiosity, they showed subjects

blurred pictures followed by either a clear picture of the blurred object or a picture of an

unrelated blurred object. Subjects were not provided with knowledge of the identity of some of

the blurred objects. Like Gruber et al. (2014) their method allowed them to examine differences

between how the brain processes the induction of curiosity (pure curiosity) compared to how the

brain processes resolution when missing information is gained (Jepma et al., 2012). They found

that curiosity initially evoked an aversive state of arousal but was rewarded when the missing

information was obtained (Jepma et al., 2012). These states became evident by observing how

the brain processed information (Jepma et al., 2012). Additionally, curiosity reduction was

followed by enhanced memory and activation of regions of the brain associated with reward

processing, thus indicating that curiosity that leads to knowledge is intrinsically rewarding

(Jepma et al., 2012). Jepma et al. (2012) suggested that, "inventing ways to arouse people's

curiosity could contribute to the optimization of educational systems and advertising strategies,

and may promote scientific discovery." (p. 8).

The neurological studies shared above appear to have garnished attention from educators

and the mainstream public (Lent, 2016; Singh, 2014). Perhaps, studies connecting brain

functioning and curiosity will encourage more researchers to conduct empirical studies on the

relationship between curiosity and academic achievement. The results may provide the evidence

needed to make fostering curiosity a priority in schools.

<u>Lifelong Learning</u>

The positive impact of fostering curiosity reaches beyond academic success in school by

providing greater satisfaction for adults in life and career. Curiosity was associated with life

satisfaction and higher levels of job performance and satisfaction (Mussell, 2013; Park, Peterson,

& Seligman, 2004). Furthermore, the disposition of curiosity was positively linked to lifelong

learning (Fulcher (2008). In older adults, men and women with higher states of curiosity lived

up to five years longer than those lower in curiosity (Swan & Carmelli, 1996). Additionally,

curiosity was found to enhance long-term memory in the elderly, suggesting that fostering

curiosity may be even more crucial for older adults who often experience long term memory loss (Mcgillivray, Murayama, & Castel, 2015). Thus, the benefits of being curious impact individuals' quality of life throughout adulthood.

<p style="text-align:center">Support from Education and Business Leaders</p>

Further support for fostering curiosity was noted by education and business leaders. The Partnership for 21st Century Learning (P21), a diverse coalition that includes business leaders, education leaders, and policymakers, kick-started a national conversation on the importance of 21st century skills for all students (P21, 2009). As a result, they identified vital skills all children need in order to be successful in college, career, and life in the 21st century. Two of the essential skills noted were creativity and innovation, in which curiosity was included as a subskill (P21, 2009). Similarly, curiosity and imagination were named two of the seven skills business leaders identified as essential for the 21st century workplace (Wagner, 2009). In order to meet the needs of businesses, curiosity and practices that foster it need to be addressed by teachers and academic leaders.

<p style="text-align:center">State of Curiosity in Schools</p>

Given the benefits of being curious noted by researchers, educational leaders, and business leaders, one would assume practices aimed at fostering curiosity would be prolific in K-12 classrooms. However, this appears to not be the case. For example, Engel (2009) and her students from Williams College attempted to research the types of curiosity displayed by school-age children. However, their study was discontinued because the children they observed

displayed too few curiosity type behaviors for them to analyze. Kindergarten students

demonstrated as few as two to five curiosity episodes per two hours. The number of curiosity

episodes posed by fifth grade students was even more dismal, a scant zero to two episodes during

the same time period (Engel, 2009). The lack of curiosity type behaviors initiated by students is

not a new phenomenon. Historically, teacher-posed questions, rather than student-posed

questions, have dominated classrooms (Dillon, 1988; Susskind, 1979). This trend has occurred

even though research has demonstrated that children's self-posed questions hold special meaning

and thus more likely than teacher-posed questions to motivate them to seek new knowledge

(Dobler & Eaglton, 2015). When Dillon (1988) visited 27 high school classrooms, he recorded

as many as four to five questions per minute coming from teachers while remarkably very few

initiated by students. Dating back even further, Susskind (1979) and his colleagues observed 32

intermediate elementary classrooms and reported even more dismal findings. Teacher questions

exceeded 50 per half hour while student questions equaled less than two during the same time

period. Teachers' questions far exceeded what they had predicted and the majority of their

questions tended to be competitive in nature. The number of questions posed by school-age

children contrasts sharply with the number of questions posed by preschool children. In one

extensive study on children's questions, four preschool age children asked an average of 107

questions in one hour and 71% of the questions were identified as information seeking

(Chouinard, 2007). This poses the question, what happens to children's curiosity once they

begin formal schooling?

<u>Impact of Educational Reform and Policies</u>

The reasons why curiosity type behaviors have not been fostered, particularly in schools, can only be inferred, but research indicates teachers' perceptions of education policies place constraints on their ability to employ practices that foster curiosity. Dating back to 1979, testing policies were partially blamed for impeding instructional practices that encourage student-posed questions and foster curiosity (Susskind, 1979). Teachers feared that deviations from the curriculum would prevent them from covering the content in their textbooks – content students would be evaluated on during standardized testing. The teachers' perceived lack of autonomy prevented them from using their own internal criteria to justify a change in practices even when they believed the change would enhance student learning (Susskind, 1979). Susskind concluded that "the teacher's ability to adopt a more student-centered approach depends, on large part, on the support and respect she received from the school administration" (p. 106).

Similar conditions may have been responsible for squeezing curiosity-fostering practices from the educational experiences of current prospective teachers. Approximately 13 years ago, President George W. Bush led congress to approve the No Child Left Behind (NCLB) Act of 2001 (No Child Left Behind [NCLB], 2002). Although all of the provisions of NCLB impacted education, the emphasis on accountability had the greatest influence on teaching practices at the school level. In order to ensure accountability, NCLB required state governments to test students at all levels of schooling and report the results (NCLB, 2002). Consequently, pressure was placed on educators and students to demonstrate evidence of learning by improving test scores (Vande-Corput, 2012). In most states, NCLB raised the stakes for students and educators. For students, low test scores could prevent them from being promoted to the next grade level and

from receiving a high school diploma (Abrams, 2004). For teachers, students' test scores had the potential to negatively impact their evaluations and job security (Santoro, 2011). Teachers often responded, out of fear or directives from administrators, by increasing students' time on test preparation. Furthermore, the focus on high stakes testing narrowed instruction to tested standards at the expense of teaching valuable curriculum that would not be tested (Abrams, 2004; Santoro, 2011). Teachers' perceived lack of autonomy resulted in curriculum decisions that limited students' opportunities to direct their own learning and explore subjects or concepts that interested them (Abrams, 2004). While education reforms like NCLB may not have been solely responsible for the lack of curiosity-type behaviors recently observed in classrooms, there is some evidence that indicates an environment created by high stakes testing and accountability undermines teachers' autonomy to implement practices that foster curiosity in their students.

The impact of perceived lack of autonomy on teaching practices was illustrated in an experiment conducted by Engel and Randall (2009). Teachers and students were given raisins and liquid mixed with baking soda and vinegar in order to conduct an experiment together. The teachers were randomly assigned to either a group that was told to help the child complete a science worksheet or to help the child learn more about how things float and sink. Both groups of teachers were unaware that students were in on the research. Prior to meeting with the teacher, the students were instructed by the researchers to drop an item not mentioned on the worksheet into the liquid while the teacher was watching. Teachers in the learn-more condition overwhelmingly encouraged students' experimentation compared to teachers in the worksheet condition (Engel, 2011). It seems that teachers' perceptions of their role may override their judgments and place limits on the instructional practices they employ.

In summary, it appears fostering curiosity has not been a priority of educational policies or school practices. When practices that foster curiosity are neglected, the problem becomes two fold. First, students do not receive the benefits of being curious, and second, graduates from this system who choose to pursue a degree in education may have limited curiosity experiences, specifically in school experiences, to bring with them into their future careers as teachers. A first step towards reversing this trend is to obtain a greater understanding of prospective teachers' curiosity experiences, including the factors associated with their experiences. A review of the research provided insights regarding the role of individuals and the environment on curiosity-type behaviors.

<div style="text-align:center">Factors Associated with Curiosity</div>

Curiosity is not sparked or manifested in a vacuum but within a social context that includes people and the environment. Therefore, curiosity experiences are best understood by examining social factors that influence curiosity. The following review of the research will begin with factors associated with curiosity in infants and young children prior to formal schooling. It will be followed by a review of research on factors that influence curiosity in school-age children and adults.

Infancy through Early Childhood

The desire to explore, in infants and young children, is intrinsically motivated and commonly attributed to curiosity. Although this desire appears to be innate, the extent of children's curiosity can vary. There is no definitive research to explain whether or not their varying levels of curiosity are due to biological differences or differences in external factors

(Jirout & Klahr, 2012). Most researchers contend that variances in curiosity levels among individuals are likely due to both innate and external factors. According to Kashdan and Fincham (2004), "The best avenue for cultivating curiosity is to create social and contextual conditions that facilitate the perceptions and emotions that lead to greater curiosity" (p. 489). Researchers have observed young children's explorations and have noted the following social and contextual conditions that influence curiosity and exploration: modeling, encouragement, trust, healthy attachments, resources, and opportunity.

Modeling and Encouragement

Parents and siblings are infants' first influential role models. As young as four months of age, infants typically learn how to manipulate their tongue and mouth to form "raspberries" by imitating an adult. There are numerous studies that indicate adult modeling influences young children's exploratory behaviors and thus learning (Bandura, 1963; Gweon et al., 2014). Toddlers who observed an adult manipulating a toy were more likely to learn from their own manipulation of the same toy rather than a toy that was not manipulated by the adult (Gweon et al., 2014). Mothers have historically had a pronounced influence on their children's behavior. Endsley, Hutcherson, Garner, & Martin (1979) found that preschool children were more likely to explore novel toys rather than traditional toys if their mothers modeled exploratory behavior and responded to their children's questions. Additionally, the authors noted that these same mothers were more likely to encourage their children to explore their environment. Encouragement comes in many forms. For example, adults may clap, smile, hug or provide verbal praise when a young child succeeds at a task. These unplanned and natural responses by adults support children's intrinsic, rather than extrinsic, motivation to perform (Deci, Koestner, & Ryan, 1999).

In turn, their positive affirmations encourage further exploration, thus propelling a cycle of learning (Eckerman & Rheingold, 1974; Endsley et al., 1979).

<u>Trust and Relationships</u>

The relationship between young children and family members creates conditions that cultivate curiosity. One such condition is trust. Trust is fostered through healthy relationships and attachments (Ainsworth, & Bell, 1970). Toddlers who have formed healthy attachments to at least one parent are more likely to take risks. These risks include exploration of objects and people (Eckerman & Rheingold, 1974; Endsley et al., 1979). Young children with older siblings have the advantage of additional familial relationships. Samuels, (1980) observed toddlers and their older siblings in an outdoor environment primarily free of toys. When toddlers were in the presence of their older siblings they tended to follow them into territories that they had not ventured into when the older siblings were not present. As a result of following an older sibling, toddlers encountered and explored novel objects. The author concluded that the bond between siblings encourages exploration (Samuels, 1980).

<u>Opportunities and Resources</u>

Typically, infants and toddlers are afforded plenty of opportunities and resources to spark and satisfy their curiosity. In most homes, even when developmentally appropriate toys are scarce, young children find an abundance of objects to explore (Collard, 1971). Pots and pans become drums and pillows become tools for stacking. When infants approach toddlerhood, they gain the mobility to explore greater distances, thus affording them with more choices and opportunities (Kretch, Franchak, & Adolph, 2014). The lure of exploration is strong enough to entice toddlers to leave their mother's side in order to explore a toy or an individual situated in a

different space (Eckerman & Rheingold, 1974). Without opportunities and resources to explore,

development and learning may be hindered. The latter was observed in infants and young

children who spent years in institutional settings, often devoid of much human interaction or

opportunities for exploration (Collard, 1971; Sheridan et al., 2012). Fortunately, even in these

rare cases, children who are removed from sterile environments and placed in stimulating

environments often catch up developmentally to their peers (Sheridan et al., 2012). While no

single condition is responsible for fostering curiosity, resources that spark curiosity and ample

time for exploring those resources are essential (Collard, 1971).

In summary, curiosity appears to initiate and propel a cycle of learning in infants and

young children that is fostered by individuals, stimulating environments, and opportunities to

explore. Family members potentially play the most significant role in fostering curiosity because

of their close proximity to the young child. They offer strong attachments, modeling, and

encouragement— conditions that plant a fertile ground for curiosity type behaviors to flourish in

infants and toddlers.

School-Age Children

The extent that factors associated with curiosity in young children continue to influence

individuals' curiosity experiences beyond early childhood has not garnished much attention

among researchers. However, there are indicators that suggest factors that influence curiosity

and exploration during infancy through early childhood continue to be present in school-age

children. The factors include individuals who encourage and model curiosity, along with

environments that provide opportunities and resources for exploration.

An exhaustive review of the research resulted in very few studies that clearly identified factors that influence curiosity among school-age children. The three studies shared below, two by the same researcher, were the only studies found that were conducted since the year 2000. The three studies are reviewed below.

Modeling

Teachers who model their own curiosity appeared to have a positive influence on students' willingness to explore (Engel & Labella, 2011). Engel and her student, Madeline, observed the impact of modeling by creating a simulated science experiment in which the directions called for raisins to be dropped into a liquid mixed with baking soda (Engel & Labella, 2011). The students were divided into two groups. For one group of children, Madeline modeled her own curiosity by dropping a Skittle in addition to the raisins into liquid. For the second group of children, she simply cleaned up after dropping the raisins into the liquid. After Madeline left the students alone, the students from the first group were more likely to experiment using the additional supplies than the students from the latter group (Engel & Labella, 2011).

Encouragement and Opportunity

In order for curiosity to flourish, students need encouragement and opportunities to explore. Engel (2011) shared how she and her student, Hilary Hackmann, built a curiosity box with drawers filled with novel objects. They left the box inside kindergarten and third grade classrooms and watched what happened.   Although children from both grades explored what was inside, there were vast differences between classrooms in the number of students who participated in the exploration. Teachers who provided encouragement through words and gestures were more likely to have higher numbers of students who explored the items in the box.

Additionally, those same students tended to have more freedom to move around the classroom. (Engel, 2011).

The research shared above suggests that school-age children are curious and will demonstrate curiosity-type behaviors when they are encouraged to explore and provided with opportunities to do so. Given what is known about young children, the findings were not surprising. When young children enter school, their curiosity doesn't vanish. On the contrary, they continue to look to adults for modeling and encouragement, and when given opportunities, school-age children act on their curiosity (Engel, 2011).

Additional Variables

In a study by Jones (2001), a variety of teacher behaviors were identified as positively influencing children's curiosity. Jones (2001) sought nominations from principals of K-12 teachers who they believed to be the best at stimulating curiosity among their students. The following classroom practices were shared by those teachers: hands on experience, asking perplexing questions, unexpected homemade displays, concrete and personal examples relevant to students' lives, playing devil's advocate, varying activities, and accepting all questions (Jones, 2001). The results were supported by conceptual studies on curiosity that found similar collative variables to spark curiosity such as unexpectedness, surprise, uncertainty, perplexity, and novelty (Berlyne, 1966; Day, 1982).

It is important to note that curiosity experiences among young children and school-age children share several commonalities. They include positive relationships with individuals who encourage exploration and model their own curiosity, along with environments that provide opportunities and resources to explore. However, studies examining curiosity experiences are

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scarce and most rely on experimental designs rather than observations of curiosity episodes. There is much to be gained by gathering and examining first person accounts of individuals' lived curiosity experiences.

Motivation

Related to factors that influence individuals' curiosities are theories of motivation. Curiosity and intrinsic motivation are so closely related that curiosity is occasionally defined as an intrinsic motivation to learn (Murphy & Alexander, 2000; Silvia & Kashdan, 2009). Motivational theories help explain the choices people make. Theories of motivation, along with empirical studies that examine the relationship between motivation and curiosity, may assist in understanding how tenets of motivational theories influence prospective teachers' future beliefs and practices related to curiosity. Curiosity has been linked to self-efficacy, self-determination, and goal orientation theories (Gulten, Dilek, Yaman, Deringol, and Ozsari, 2011; Hulme, Green, and Ladd, 2013; Kashdan & Fincham, 2004, Pajares, 1996).

Self-efficacy

Self-efficacy is measured by the extent individuals believe they have the capacity, skills, and knowledge to be successful in their pursuits (Pajares, 1996). Thus, it makes sense that individuals are more likely to put effort into tasks that they are confident will result in success, and that they tend to avoid tasks they assume will result in failure. Questioning is one of several tools young children use to gather information about their world. Preschool-aged children were found to be incessant in their use of questioning (Chouinard, 2007). When their initial questions went unanswered, they don't give up easily. Rather, they persistently asked more questions until

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they are satisfied with the information they obtained (Chouinard, 2007). Their persistence demonstrated strong self-efficacy, grounded in the belief that their questions will eventually result in answers.

The link between self-efficacy and curiosity was the focus of a study by Gulten et al. (2011). Like the current study, participants were prospective teachers representing diverse education tracks. Utilizing a survey to measure curiosity and self-efficacy beliefs related to computer usage, they found prospective teachers with greater breadth curiosity tended to have more positive beliefs about their potential to use computers. The researchers contended that self-efficacy beliefs are affected by prior experiences, which in turn affect continuous computer using (Gulten et al., 2011). This holds significance to the current proposed study because it explores the influence of prospective teachers' prior experiences and their likelihood of transferring their experience into their future teaching.

<u>Self-determination</u>

According to Ryan and Deci (2000) the psychological need for autonomy, competence, and relatedness make up the tenets of self-determination theory. Autonomy refers to individuals' need for control and independence, while competence refers to individuals' need for mastery. Relatedness describes individuals' need to belong and typically results from forming positive relationships with others. When all three needs are met, individuals are likely to be self-determined and intrinsically motivated (Ryan & Deci, 2000).

Kashdan and Fincham (2004) believe tenets of self-determination theory support the expression of curiosity. They contend autonomy, competence, and relatedness are antecedents to curiosity. Autonomy provides individuals with opportunities to act or explore subjects that spark

curiosity. Competence is a motivator and reward for mastering subjects or skills, and relatedness

provides support for further exploration and risk taking (Kashdan & Fincham, 2004). According

to Kashdan and Fincham (2004), "overall curiosity is more likely to be enhanced when control is

minimized and feelings of personal choice, meaningfulness, and competence-related processes

are emphasized" (p. 485).

While Kashdan and Fincham (2004) provided a conceptual understanding of the link

between self-determination theory and curiosity, they acknowledged that few empirical studies

had been conducted to support their theory. However, there is some evidence that the tenets of

self-determination play an important role in fostering curiosity among young children. For

example, prior to entering formal schooling, young children are afforded many opportunities to

choose how and what to explore. While they may be encouraged to play with a particular toy

over something like the dog's tail, they are, within reason, given autonomy to choose and act on

their curiosity. Their explorations are often accompanied by activities that fulfill their need for

competence, as evidenced by the toddler who successfully manages to take that first step. Their

accomplishments are often celebrated by loved ones, which in turn, encourage further

exploration and learning (Kashdan and Fincham, 2004). In essence, curiosity propels a cycle of

learning that is enhanced in the context of relationships that encourage exploration and moderate

risk taking (Eckerman & Rheingold, 1974; Endsley et al., 1979).

Goal Orientation

Goal orientation theory contends that individuals are motivated by mastery (sometimes

referred to as learning) and performance type goals (Senko, Hulleman, & Harackiewicz, 2011).

Individuals with a mastery goal orientation tend to be motivated by a need to develop

competence. They pursue learning opportunities for the sake of developing or increasing their knowledge or skills and compare their growth to prior levels of mastery. On the other hand, individuals with a performance goal orientation tend to compare their performance to the performance of others and are motivated by competition or a need to demonstrate their ability. In general, mastery oriented individuals tend to hold a belief that intelligence is malleable and effort contributes to achievements and are motivated intrinsically to achieve, whereas performance goal oriented individuals view intelligence as fixed and are motivated by external factors. Individuals can be oriented to both learning and performance goals simultaneously or at different times for different pursuits (Senko et al., 2011).

The relationship between goal orientation and curiosity was examined in a recent study. Hulme, Green, and Ladd (2013) interviewed twenty high achieving seniors from five universities in the United States in order to understand the nature and nuances of curiosity. After two rounds of interviews, two themes emerged that represented students' goal orientation. Students with a mastery orientation were intrinsically motivated and had a strong desire to be challenged, preferred questions that would expand their knowledge, thrived on uncertainty, and took more risks. They were high in academic achievement and in curiosity. Students with a performance orientation tended to be motivated by grades and preferred questions that required a specific answer. They strived to get assignments done, obtain future recognition, and please faculty members. Their fear of failure often prevented them from taking risks. Although both groups were considered high achieving, their motivation to excel was driven by a divergent set of goals (Hulme et al., 2013).

In summary, researchers have suggested that the motivational theories discussed above demonstrate overlapping or connected attributes associated with curiosity. Consequently, the theories may assist in understanding the lived curiosity experiences of prospective teachers. Although self-efficacy, goal orientation, and self-determination theories of motivation were studied as independent constructs, a close look at the attributes of each theory reveals overlapping and reciprocating attributes. Thus, experiences that positively impact individuals' self-efficacy beliefs, mastery goal orientation, and need for self-determination may share similar properties with experiences of curiosity.

The Experience of Curiosity

While an exhausted review of the literature did not uncover studies that specifically examined prospective teachers' lived curiosity experiences using a phenomenological approach, the results of the study that follows provides some insights into how curiosity is experienced by individuals self-described as being highly curious. The results may help inform and understand the lived curiosity experiences of those participating in this current study.

Levitt et al. (2009) conducted a study using grounded theory to examine how people who experience specific curiosities understand and experience curiosity in their lives. Six men and five women who self-reported having sustained curiosity in a subject volunteered to participate. The primary question asked of each participant was, "Describe your experience of strong curiosity." The recorded transcripts were analyzed using a constant comparison method to form a hierarchy that eventually concluded with one central finding. The core finding described by the researchers was, "Curiosity is an Emotionally Compelling and Evolving Process to

Understand Differences That Hazards the Danger of Engulfment" (p. 206). The clusters that formed the core finding described how curiosity fulfilled a variety of functions for the participants in the sample group. The functions of curiosity were (a) it brought them closer to others who shared similar interests; (b) it motivated them to learn and master different tasks; (c) it led to personal development and self- awareness; and (d) it motivated them to understand the ways that other people or situations differed from their own expectations of the world (p. 207).

While the authors claim to have used grounded theory, the research results appeared to lack a theory of curiosity. The research question and analysis process shared many commonalities with the current study. Like this current study, the researchers used semi-structured interviews to gather descriptions of individuals' curiosity experiences and used similar procedures to analyze their data. However, it is also important to highlight major differences between the two studies. The 12 participants were between the ages of 25 to 56 years old, most were college graduates, and all were recruited through flyers posted at the university and in the community. Most importantly, a condition of volunteering stipulated participants must have experienced a recent wanting to know more about a topic that was meaningful to them and that they were actively pursuing. Given the stipulation, participants were more likely to describe depth curiosity rather than breadth curiosity experiences. In contrast, volunteers participating in the current study were provided with only vague information regarding the purpose of the study prior to their interview. Therefore, the extents of their curiosity or types of curiosities experienced were unknown and not a condition of their participation.

It is important to point out that, like the study shared above, the majority of empirical studies on curiosity rely on selective participant sampling. In other words, participants were

identified prior to being selected as having high curiosity or high academic achievement. What is missing from many of the studies is an understanding of the experiences of individuals who may not appear or self-report as being highly curious. While certainly some individuals may have stronger trait curiosity than others, the current study assumes all individuals are innately curious. Consequently, it is assumed that all participants will have experienced curiosity episodes, albeit to varying degrees, and will be able to recall and describe moments in which their curiosity was sparked.

Influence of Lived Experiences

The participants in this current study have chosen to pursue an education degree with the goal of becoming a teacher. In contrast to professions other than teaching in which students spend little or no time observing, the participants have been immersed in their future profession and have developed theories related to what it means to be a teacher. In their role as a student, they participated and were immersed in a variety of pedagogical practices, spending countless hours observing teachers. They enter higher education with preconceptions about what it means to be a teacher. Lortie (2002) coined the term apprenticeship of observation to describe this unique experience that differs from other professions.

Several studies have explored the influence of prospective teachers' personal histories on their learning and teaching (Knowles & Holt-Reynolds, 1991; Powell, 1992; Sexton, 2004). Personal histories are defined as "those experiences that mold the educational thinking of preservice teachers" (Knowles & Holt-Reynolds, 1991, p. 89). The findings demonstrated the influence prior experiences, particularly school experiences, had on future teaching beliefs and

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practices. The studies ranged from a focus on general teaching beliefs and practices to content-specific practices in science and reading. While the experience of curiosity was not specifically addressed by the research that follows, the connection between lived experiences and teaching beliefs supported the rationale for understanding and examining prospective teachers lived curiosity experiences.

Powell (1992) explored the experiences of 42 traditional and nontraditional secondary preservice teachers to learn how their experiences influenced their pedagogical development. Traditional students were highly influenced by the teachers they had in the past, both in high school and in college, whereas nontraditional students were more influenced by the teachers they had during their teacher preparation program. The traditional students relied on practices they observed from their perspective as a student. The nontraditional students were more likely to rely on practices that they were taught in teacher preparation classes.   Powell concluded that preservice teachers' prior experiences influence their perspective of what it means to be a teacher and will drive their future teaching decisions (Powell, 1992).

Memories of specific teachers have a great deal of influence on how prospective teachers define teaching and perceive their role as a teacher (Sexton, 2004). Sexton found the majority of elementary and secondary prospective teachers recalled at least one or more teachers who had a profound impact on their beliefs. Sometimes, the remembered teacher was one they perceived as not very good, and consequently, they strived to be a different type of teacher. Elementary prospective teachers tended to remember a teacher they had in elementary school, whereas secondary prospective teachers tended to remember a teacher they has in secondary school. Although prospective teachers with progressive views of teaching and learning tended to espouse

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progressive views, they often found themselves battling between their apprenticeship of observation experiences and their more progressive beliefs (Sexton, 2004).

Cam (2015) explored how prior experiences with science influenced the epistemological beliefs and practices of 22 primary preservice teachers attending a university in Turkey. He examined students' classroom reports, plans, diaries, and written accounts of their learning histories. The preservice teachers' histories included a mixture of traditional and constructivist practices. Although many of the preservice teachers held highly sophisticated epistemological beliefs, which included constructivist approaches, they generally did not incorporate practices aligned with their espoused beliefs in the simulated presentations delivered as part of their coursework (Cam, 2015).

Similar to the current educational reform movement in the U.S., the Ireland National Plan for Literacy and Numeracy has placed increased pressure on accountability, student performance, and productivity (Furlong, 2013). Furlong utilized semi-structured interviews of 15 postgraduate diploma primary prospective teachers to help understand how their personal histories, created by their experiences and history as students, shaped their theory of teaching and learning. Furlong found prospective teachers' beliefs were more influential in determining their teaching decisions and practices than the knowledge they gained in coursework. He concluded that prospective teachers need to be encouraged to critically evaluate their preconceptions of what it means to be a teacher and suggested this might be accomplished through inquiry and reflection (Furlong, 2012).

Sampson, Linek, Laverne, and Szabo (2013) examined the extent preservice teachers implemented specific comprehension strategies into their internship experience. Prior to entering

their internship, 18 preservice teachers were assessed on their knowledge of reading strategies previously taught as part of their university coursework. During their internship, several sources of data were gathered to determine the extent in which the preservice teachers implemented the strategies they understood. Despite evidence that the preservice teachers knew the reading strategies, their findings indicated that neither knowledge nor prior exposure to comprehension strategies transferred into teaching practices. This was especially profound when strong external influences, such as scripted programs and high stakes testing, were in place. The authors suggest that further studies regarding reading practices be conducted to determine the extent that prior K-12 experiences deterred the preservice teachers from implementing the reading strategies (Sampson et al., 2013).

While the studies share above focus on the influence of K-12 schooling as a determinant of prospective teacher's future teaching beliefs and practices, the following study explored the mediating effect of contexts outside of school (Smith, 2005). The practices of two elementary teachers, Hannah and Vicki, were examined and compared, specifically their pedagogical views and practices on science instruction. The teachers were purposefully selected based on the criteria that they had similar K-12 school experiences related to science instruction. Both teachers experienced a traditional textbook approach to learning science that required them to answer questions related to information they gained from reading the text. Despite their similar backgrounds related to science, the teachers held contrasting views with respect to their beliefs about teaching science. Hannah embraced hands-on inquiry science practices that integrated technology and connections to real world experiences, whereas Vicki preferred traditional practices that relied more heavily on the transmission of knowledge. An analysis of their

experiences outside of the classroom related to science revealed that they differed sharply. Hannah's early experiences involved science related activities that she described as enjoyable and were influenced and shared with her parents and siblings, whereas Vicki's history lacked the kind of enjoyable social experiences with science described by Hannah. Although both teachers stated their teacher preparation programs emphasized a hands-on inquiry approach to science, their out of school experiences offered a better explanation of their differences in science beliefs and science teaching practices (Smith, 2005).

The studies reviewed in this section highlight the need to understand prospective teachers' prior experiences, how those experiences are perceived, and how the experiences contributed to their beliefs about teaching and learning. According to Knowles and Holt-Reynolds (1991) prospective teachers cannot be talked out of what they know and believe about schools, nor should their experiences and processes for which they have come to understand what it is to be a teacher and to teach be discounted. Beliefs founded on memories of learning in classrooms are difficult to change. However, the earlier beliefs are challenged, the more likely teachers will modify them (Swars, Hart, Smith, Smith, & Tolar, 2007). Teacher educators can support the process by helping prospective teachers understand how their personal histories influence and shape their beliefs about teaching and learning (Knowles & Holt-Reynolds, 1991).

Teacher Preparation Program Initiatives

Although lived experiences influence teaching beliefs and practices, it would be remiss to think that what a prospective teacher learns while enrolled in a teacher preparation program has little value or significance on their future teaching beliefs and practices. Teacher preparation

programs provide valuable knowledge to prospective teachers. However, research indicates that despite acquiring valuable knowledge during their teacher preparation programs, prospective teachers often fail to overcome challenges that impact their ability to apply what they have learned.

Some teacher preparation programs have found ways to address and capitalize on prospective teachers' lived experiences. For example, Boyd, Gorham, Justice, and Anderson (2013) incorporated autobiographical reflection into an online blog designed for preservice teachers with the goal that students would create an ongoing community that encouraged authentic conversations. The instructors refrained from commenting or using the blog as an assessment or assignment. The hope was that the preservice teachers would build on or challenge, when necessary, some of their apprenticeships of observation practices. They referred to those occurrences as moments of disruption. Many of the preservice teachers refrained from critiquing beliefs and practices and not all of them experiences moments of disruptions; however, of those who did, the authors concluded it was a powerful experience Boyd et al., 2013).

Westrick and Morris (2016) implemented a similar initiative with the same purpose in mind: to help students' move beyond their apprenticeships of observations and replace naïve misconceptions about teaching with sound pedagogy. The specific focus of the instruction preservice teachers received was on understanding and adapting effective assessment practices. The model included an interactive presentation in which novel information was delivered and prior misconceptions were challenged. The presentation was followed by a blogging activity to encourage and support students' processing of the new information. Students' blogging responses were analyzed and categorized. The majority of students' responses fell into

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categories titled, surfacing, confronting, or beginning. The authors concluded that the majority

of students demonstrating shifts from thinking like a student to thinking like a teacher (Westrick

& Morris, 2016).

The two studies shared above demonstrated that preconceived beliefs and practices held

by prospective teachers as a result of their apprenticeships of observations could be capitalized

on or modified. Incorporating online blogging into teacher preparation courses is one potential

tool for making that happen. However, good teaching begins with unearthing students' prior

knowledge and experiences before layering new knowledge. The goal of this current study is to

unearth the lived curiosity experiences prospective teachers bring to teacher preparation

programs as a first step towards ensuring that they will be prepared to foster curiosity in their

future students.

<u>Conclusion</u>

The review of the research above demonstrated how curiosity is commonly

conceptualized by researchers. It underscored the challenges of defining and measuring curiosity

that appear to discourage researchers from studying the construct. Given the benefits of being

curious, it is imperative that additional research be conducted. Individuals responsible for

preparing prospective teachers need to understand the curiosity experiences their students bring

to teacher preparation programs so that they can capitalize on or challenge prospective teachers'

preconceived beliefs about teaching and pedagogy, particularly as they relate to curiosity. As a

result, prospective teachers will be better equipped to foster curiosity in their future students

CHAPTER THREE

Study Overview

A review of the research indicates that practices that foster curiosity have been neglected in schools despite the stated benefits of being curious (Engel, 2011; Santoro, 2011). Research has demonstrated that prospective teachers' experiences prior to entering the teaching profession significantly influence their future teaching beliefs and practices (Cam, 2015; Furlong, 2012; Knowles & Holt-Reynolds, 1991; Powell, 1992). Therefore, it is important to understand and examine the lived curiosity experiences prospective teachers bring to teacher preparation programs. This study will draw on qualitative methods of phenomenology, specifically in-depth interviewing, to capture and analyze descriptions of prospective teachers' lived curiosity experiences. The findings will move teacher preparation programs one step closer to ensuring prospective teachers are prepared to foster curiosity in their future students.

Organization of Chapter Three

Chapter Three begins with a review of the research purpose and questions and is followed by the rationale for using a qualitative design based on tenets of phenomenology. After an explanation of the overall study design, an elaboration of each step of the design study is provided. The steps include the sampling strategy, the data collection process, and the data analysis methods. The final section of chapter three explains the measures that were taken to ensure and increase the rigor of the study.

Research Purpose and Questions

The purpose of this study is to examine and understand the lived curiosity experiences of traditional college freshmen pursuing an education major so that the knowledge gained can be used to inform teacher preparation programs, support the current body of research on curiosity, and set the stage for new research. As introduced in Chapter One, it was determined that one overarching research question (RQ1) with three research sub-questions (RSQ1-3) best fit the purpose of this study. The research questions are as follows:

RQ1:   What are the lived curiosity experiences of traditional freshmen pursuing an education major?

RSQ1-1:   To what extent have they experienced curiosity?

RSQ1-2:   What factors influenced their experiences?

RSQ1-3:   What meaning do the experiences hold for them?

In order to answer the research questions above, it was necessary to obtain first person accounts of curiosity experiences because they provided the best means for gathering rich descriptions. Through interviewing, the data collection technique most commonly used for this purpose, the researcher was provided with the flexibility needed to prompt participants in real time, to seek clarification, and expand on their curiosity experiences (Moustakas, 1994). It was anticipated that the descriptions provided by participants would include information about the people, environment, context, and emotions connected to their curiosity experiences.

Methodological Approach

A qualitative approach was determined to be the most effective means for producing findings that aligned with the research questions. While quantifiable data is valuable when the goal of the research is to make comparisons or determine correlations, qualitative data is more appropriate when there is not much known about the topic and the goal is to explore the topic further (Creswell, 2013). A review of the research produced few current studies in which the phenomenon of curiosity was explored and no research studies were found that aimed at understanding prospective teachers' curiosity experiences. Furthermore, the majority of recent studies primarily drew on quantitative methods that relied on self-reporting to measure trait curiosity. This current study aimed at understanding curiosity as a state and placed less emphasis on trait curiosity. In fact, it was assumed that curiosity, as a trait, exists to varying degrees in all human beings. Therefore, the goal was not to measure curiosity but to understand how it is experienced, particularly among prospective teachers. This goal is best accomplished using a qualitative design.

Among the various qualitative approaches, phenomenological methods were determined to most closely align with the purpose of this research. At the heart of a phenomenological approach is a desire to understand how individuals' experience a particular phenomenon (Moustakas, 1994). Phenomenology encourages the researcher to put aside prior knowledge, assumptions, and beliefs and focus solely on the stories and descriptions of participants (Moustakas, 1994). Researchers have identified prospective teachers' stories, or lived experiences, to be influential in determining their future teaching beliefs and practices (Furlong, 2012; Knowles & Holt-Reynolds, 1991). Consequently, it makes sense to choose an approach

that places value on understanding the phenomenon from the perspective of future teachers. There are few methods that produce data aligned so appropriately with the goals of this study. The methods of phenomenology, including data gathering and analysis, provide the structure and support to ensure the current study generates valuable insights and new learning.

<div align="center">Research Design Overview</div>

The design of this research study followed steps specific to qualitative research and phenomenology suggested by Creswell (2013). An explanation of the major procedural steps, along with specific details related to this study, are provided below.

1. The researcher develops a thorough understanding of the selected design approach.

A thorough investigation of the philosophy behind phenomenology was gathered in order to make an informed decision between various approaches. The two types of phenomenological approaches, descriptive and interpretive, were investigated to determine the best fit for this study. Descriptive phenomenology was selected to guide this research because it encourages researchers to set aside their personal beliefs and prior knowledge of the phenomenon under study, using a process called bracketing, in order to understand the phenomenon through the lens of others (Reiners, 2012).

2. The researcher generates open-ended questions to prompt participants to share what they experienced in terms of the phenomenon under study and details of the context that influenced their experience.

The research questions were created and reviewed by experts in the field to ensure that they were in line with the philosophy and intent of phenomenology. Questions that required

analysis or evaluation were deleted or revised to ensure participants' responses were descriptive in nature.

3. The researcher identifies individuals who have experienced the problem and collects data primarily using in-depth interviewing.

The current study utilized semi-structured interviews to collect data from a purposeful sample of traditionally-aged freshman pursuing an education degree. The assumption was made that all participants in the sample had experienced curiosity to varying extents and would be able to recall and share details of their experience.

4. The researcher subscribes and utilizes an analysis process based on the philosophy of phenomenology.

The interviews were transcribed and analyzed based on the philosophy of descriptive phenomenology as recommended by Moustakas (1994). The specific procedures included identifying relevant statements and their meanings, labeling themes, and defining textural and structural descriptors for each participant.

5. The researcher uses the data to write a composite description that conveys the essential, invariant structure of the experience (Creswell, 2013).

The findings, reported in Chapter Four, include a cumulative essence of the experience of curiosity extrapolated from all 13 participant interviews, in addition to an explanation of the structural and textural descriptions extrapolated from the invariant constituents and themes.

<u>Research Sample</u>

All participants in the research sample were enrolled as freshmen at the same large urban

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university located in the southeastern United States. The student population is diverse: students come from all 50 U.S. states and 148 countries, and minorities represent about 40% of the student population. Approximately 20 percent of the students reside in on-campus housing, thus many of the students commute from the surrounding regions.

The sample population was comprised of students pursuing one of several education majors offered by the university. The university's College of Education is accredited by the National Council for Accreditation of Teacher Education (NCATE) and provides over 100 degree options to prepare students for a career in both primary and secondary education. There are currently just fewer than 4,000 undergraduates and 2,000 postgraduates enrolled in the college. The college offers 14 undergraduate degree options, 63 graduate degree options, 11 minors, as well as two undergraduate certificates and 23 graduate certificates.

The university does not consider the majority of underclassmen eligible for acceptance into one of the college's programs of study until they have completed all of the program's prerequisites. However, underclassmen are permitted to enroll in education foundational courses. The 13 participants who participated in this study were enrolled in one of two selected education foundational courses. Each of the participants stated he/she intended on pursuing an education degree, specifically three in early childhood, six in elementary education, three in secondary education, and one in K-12 music education. All of the participants were considered to be a traditionally-aged freshman, enrolling at UCF immediately after graduating from high school. No deliberate decision was made to narrow the sample group by type of K-12 schooling, intended education major, race and ethnicity, or gender. Greater priority was given to recruiting enough participants to reach saturation, a point in which no new insights would likely be

extracted by additional (Moustakas, 1994).

<p style="text-align:center">Sampling Procedures</p>

Purposive sampling, specifically criterion sampling, is commonly used as a method for selecting participants for phenomenological studies (Creswell, 2013). This method of sampling helps ensure that all of the participants have experienced the phenomenon being studied (Creswell, 2013). The individuals for this study were recruited based on meeting specific criteria, namely that they were enrolled as a freshman, accepted into the university directly from high school, and their intent was to pursue an education degree.

Implied within phenomenology is the intentional study of a population whose members have experienced the phenomena under study (Creswell, 2013), the goal of which is to capture the composite essence of the experience as described by the participants. Therefore, narrowing the study sample to a homogenous group (i.e. prospective teachers of approximately the same age) will likely produce data that comprises overlapping and similar qualities. The decision to include freshmen and exclude students further along in the teacher preparation program was made to obtain an understanding of the curiosity experiences they bring to teacher preparation programs. Additionally, the curiosity experiences participants share can be delineated from the curiosity experiences they might gain while attending college. The exclusion of nontraditional freshmen was made in order to isolate experiences that might occur between high school graduation and college entrance. Older students are more apt to have experiences that include prior careers, marriage, children, or other life experiences that may influence the meaning they attach to their curiosity experiences. While certainly the experiences of nontraditional students

are valuable to understanding the type of teacher they will become, research related to their experiences was outside the scope of the present study.

Participants were selected by recruiting volunteers from two foundational education courses. University faculty members currently teaching the courses were contacted and asked to give permission to the researcher to visit their classrooms for the purpose of recruiting students to volunteer for this study. One faculty member teaching both foundational courses was selected because her courses included a higher number of traditional freshmen than the same course taught by other faculty members.

During the researcher's visit to each of the three classes, she introduced herself as a doctoral candidate interested in interviewing traditional freshmen about their experiences. She made the decision to share minimal background knowledge regarding the topic of research at that time in order to diminish the chance that only students who considered themselves curious would volunteer. The students were told volunteering would entail one or two interviews arranged at a site and time that was convenient for them and that in exchange for their time, they would be given a choice of one of three $10.00 gift cards. Furthermore, she shared with students that due to the narrow focus of the study, she could only accept volunteers considered to be traditional freshmen, students who enrolled at the university immediately after graduating from high school.

During her first attempt to recruit volunteers, she shared her business card with contact information with all students who met the requirements and demonstrated interest in volunteering. Of the 13 students who showed interest, she received six responses by means of text messaging. All six participants were included in the sample population. During her second and third attempt to elicit volunteers, she asked interested students to provide their contact

information. Of the nine students who provided contact information, seven responded and were included in the sample population. The 13 participants fit within the recommendations for a phenomenology-based study as long as participants could provide rich descriptions of the phenomenon (Creswell, 2013). All participants were able to provide adequate descriptions of their curiosity experiences.

Data Collection Methods

In phenomenological research, the most common method of collecting data is through in-depth, semi-structured interviewing (Creswell, 2013). Given the intensity and time required for in-depth interviews, small samples of participants are typically recruited (Creswell, 2013). Face-to-face interviews allow the researcher to collect verbal and nonverbal cues such as gestures and facial expressions, in addition to asking clarifying questions in real time (Shank, 2002). Obtaining rich descriptions of the phenomena is at the heart of phenomenological research Moustakas, 1994). The goal is to understand the characteristics of the experience from the participants' perceptions rather than extrapolating data from research. Therefore, it is crucial that the phenomenological researcher set aside prior knowledge and experiences to listen and understand the experience as described by the participant (Moustakas, 1994).

Given the purpose of this study was to examine the lived curiosity experiences of prospective teachers, conducting semi-structured interviews was found to be the most effective data collection method. Other forms of data collection were evaluated but determined to fall short of producing rich data or had inherent challenges too difficult to overcome (Creswell, 2013). One of the most common tools used for data collection on the phenomena of curiosity is

surveying individuals using research-based curiosity scales (Jirout & Klahr, 2012). While using

this method is likely to produce a larger database, the findings would possibly exclude the rich

descriptions gained through face-to-face interviewing. Another choice for data collection is

observation (Creswell, 2013). However, observations of curiosity experiences require catching

participants in a curiosity state. This is an obvious challenge and would likely require placing

individuals in a contrived situation rather than observing them engaged in a natural setting.

The decision to use a semi-structured interview protocol to gather data aligned with the

purpose of the current study. The use of open-ended questions to collect data provided the

flexibility to respond to participants' descriptions and prompt for further elaboration as needed

(Seidman, 2006). The open-ended nature of the questions provided an opportunity for

participants to describe their experiences fully. Additionally, the format suggested and supported

a conversational tone, which helped equalize the relationship between the researcher and

participant (Seidman, 2006).

The design of the interview protocol and inclusion of specific questions took into account

prior research on lived experiences and teaching beliefs and practices. Based on the seminal

research of Lortie (2002) and subsequent studies of several other researchers (Knowles & Holt-

Reynolds, 1991; Powell, 1992; Sexton, 2004), the assumption was made that participants'

recollections of their curiosity experiences would provide a window into their future teaching

beliefs and practices related to fostering curiosity. Therefore, the initial over-arching question

was designed to encourage participants to describe experiences directly related to curiosity rather

than more generalized academic or social experiences. The assumption was made that all

participants would have experienced curiosity in one or more settings and that they would be

able to recall at least one experience. It is the gathering of participants' recollections and perspectives related to the construct under study that assists researchers in understanding the meaning or essence of their collective experience (Moustakas, 1994).

<u>Data Collection Instrument</u>

The instrument created to guide the interview process followed a semi-structured conversational format with the interviewer encouraging the participants to discuss, clarify, or elaborate on each question (Moustakas, 1994). The specific questions for the semi-structured interview were generated and decided upon after reading several studies and some award-winning dissertations that encompassed a phenomenological approach. Additionally, the questions were shared with a qualitative researcher with an expertise in phenomenology. The feedback provided by this expert guided revisions to the interview questions. The revisions included deleting questions that prompted participants to evaluate their experiences rather than describe their experiences, which produced greater alignment with the overarching research question. To assist in this process, examples of questions aligned with the focus of phenomenology were examined and used to guide the revisions (Creswell, 2013).

The interview questions were field-tested by interviewing three individuals who were not part of the purposive sampling group. Although the individuals did not match the participants' demographics, all three participants had a degree in education. Of the three individuals interviewed, two asked for clarification on the meaning of curiosity experiences and demonstrated doubt regarding their response. Therefore, the protocol was modified by including a brief explanation of curiosity described by Engel (2011) simply as "the urge to know more" (p.

627). The researcher felt this definition was broad enough to encourage participants to include curiosity experiences sparked by people, objects, or events.

After the field-tested interviews, the decision was made to increase the conversational tone further by using the script as a reminder to prompt for additional information when and if descriptions of participants' curiosity lacked details. Relying on the script too much appeared to limit participants' elaborations, created a formal climate, and limited the researcher's ability to attend and respond with authenticity.

Finally, a small addition to the protocol was made as a result of a trend noted in the first three interviews. The curiosity experiences shared by participants included primarily existential experiences rather than trivial (i.e. less meaningful) experiences. While sharing this trend with a faculty member, it was suggested that the researcher's positionality might influence participants' responses. In other words, the researcher's work-based title (in this case, "Associate Director") might have prompted participants to exclude curiosity experiences that may have appeared, in their minds, trivial and unworthy of sharing. Therefore, in subsequent interviews the researcher added "all experiences are valuable even if they seem trivial to you." The final interview protocol can be found in Appendix A.

Data Collection Process

The data was collected by interviewing participants in a private office at the university. At the onset of the interview, participants were ensured confidentiality and told that at any time during the interview they could choose to not answer a question or exit the interview. Additionally, participants were assured that their identity would not be included in the final written document.

Using both multiple interviews and one long interview of participants have advantages and have been advocated by researchers (Creswell, 2013; Moustakas, 1994). Whereas multiple interviews allow the researcher to gather clarifying data (Creswell, 2013), single longer interviews allow participants to go into more depth and thus may lead to richer descriptions (Moustakas, 1994). Initially, the decision was made to conduct a single interview, but during the process of analysis, it was apparent that second interviews were needed from the initial three participants in order to ensure they understood that all curiosity experiences, regardless how trivial they may seem, were valuable to the research. The additional second interviews did not result in data that influenced the final results.

At the end of the interview, each participant was given a choice of one of three different $10.00 gift cards as an appreciation for his/her time. The recorded interview was stored on the recording device and kept in a locked cabinet. The recordings were transcribed verbatim for analysis, excluding any conversation outside the scope of the study and stored on a flash drive. The flash drive and all written documents related to the study were kept in a locked cabinet when not in use.

Data Analysis Process

Applying a phenomenological approach to data analysis involves a reductive stance (Creswell, 2013), the aim of which is to reduce the phenomenon from how it is perceived naturally to its purest form. This process requires the researcher to withhold judgment and set aside preconceived beliefs so that the essence of the phenomenon emerges from the data (Moustakas, 1994). The analysis begins by identifying horizons or invariant constituents and

ends with a composite textural/structural analysis of the phenomenon under study (Moustakas, 1994). There are several variations advocated by researchers. This study draws on methods aligned with descriptive phenomenology described by Moustakas (1994). The steps, along with an explanation of the actions taken for this study, are described below.

1. Listing and preliminary grouping

The interviews were transcribed verbatim in order to keep the context intact. They are included in Appendices B through N. Moustakas (1994) recommended listing all relevant statements and treating them equally during this phase. Therefore, only statements that were deemed off topic were deleted. This step is referred to as horizontilization (Moustakas, 1994).

2. Reduction and elimination to determine invariant constituents

During this phase, statements that were necessary and sufficient for understanding the phenomenon were identified and highlighted. The invariant constituents (meaning units) were recorded in red font after each statement for each transcript. Moustakas (1994) recommended dismissing all statements that are overlapping, repetitive and vague and including only statements that could be labeled. Therefore, only statements that contained sufficient information relevant to understanding prospective teachers' curiosity experiences were labeled. This process resulted in a total of 35 invariant constituents, which are available for viewing in Appendix B.

3. Cluster and thematize invariant constituents

The invariant constituents for each transcript were clustered into themes and identified as textural or structural descriptors. Textural descriptions explain what was experienced by the participant and structural descriptions explain how the experience came "to be what it is"

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(Moustakas, 1994, p. 98). After the first transcript was thematized, another transcript was analyzed until all 13 transcripts were complete. Invariant constituents that did not fall under a prior theme were clustered and new themes were added. This process identified 12 tentative themes.

4. Final identification of themes: validation

After all transcripts were analyzed and thematized, the resulting 12 themes were narrowed to 7 themes. This process of identifying and recategorizing themes was conducted in corroboration with two collaborators at the university (a professor and a doctoral student). Their input increased trustworthiness by diminishing researcher bias, thus ensuring the final themes were grounded in the data. Finally, a review of all transcriptions was conducted to determine if the themes were explicit and compatible with participants' descriptions of their experiences. The seven composite themes, three that were clearly textural in description, one that was clearly structural in description, and two that contained subthemes that fell into both textural and structural descriptions, are explained in Chapter Four.

5. Construct individual textural/structural descriptions for each participant

After all invariant constituents and themes were identified and labeled, textural and structural descriptions were created for each participant. This step was finalized by creating a narrative encompassing both textural and structural descriptions. The textural/structural narrative for each participant can be found in Appendices Q through CC.

6. Develop a composite description of the meanings and essence of the experience

The purpose of the composite description was to convey the essence of the experience for all participants in one narrative. The narrative was written after rereading and reviewing each

textural and structural description for each participant. After several days had passed, a final reread of the description of the essence of the experience was conducted and crosschecked with the individual narratives to ensure clarity and accuracy (Moustakas, 1994).

The decision to use the steps described above was made because they provided a structure for the analysis process and a scaffold for the novice phenomenological researcher. Additionally, the steps helped ensure the analysis remained as close as possible to the descriptors provided by the participants rather than the perceptions of the researcher (Moustakas, 1994).

Ethical Issues

Employing a phenomenological approach to inquiry also required attention to ethical considerations (Creswell, 2013). Prior to the study, International Review Board (IRB) approval was sought and granted and the consent form was shared with participants immediately prior to each interview (see Appendix C for IRB approval). Given the data collection process utilized human interactions that could potentially result in the sharing of personal information, steps were taken to ensure confidentiality. At the onset of each interview, participants were assured that the information they shared would not be connected to their identity. After the interview, the data was immediately transcribed and kept on a flash drive. The flash drive and recorder containing the audio version of the interviews were stored in a locked cabinet when not in use. Transcriptions of the interviews contained no references to individuals' identities. Each participant was given a pseudonym to be used in the final written document. After the study was complete, all the records with identifiers were deleted.

Establishing the trustworthiness and validity of qualitative research is vital to the

credibility and rigor of a study (Creswell, 2013). Phenomenology, in particular, emphasizes the

importance of ensuring that any interpretation or analysis of the data represents participants'

current perceptions and reality rather than the researcher's perceptions (Creswell, 2013). During

the analysis process it is vital to stay as close to the text as possible (Creswell, 2013). In order to

decrease the risk of overreaching and increase trustworthiness, the following strategies were

employed: clarifying researcher bias, member checking, and peer review.

Clarifying member bias was accomplished through a process referred to as bracketing.

Bracketing requires the researcher to set aside all prejudgments resulting from prior experiences

(Creswell, 2013). Bracketing activities assist the researcher in this process and are important

when conducting phenomenological research because researcher bias can interfere with the

analysis of the data (Moustakas, 1994). The bracketing activities employed during this study

were self-interviews, reflective journaling, and note-taking. A colleague interviewed the

researcher regarding her lived curiosity experiences, assumptions, and beliefs and she kept an

ongoing reflective journal throughout the research process. Both products were periodically

revisited before and after analyzing the interview data. Additionally, clarifying member bias

occurred at the beginning stage of data analysis. Before delving into a thorough and deliberate

analysis of the data, each interview was immediately followed with reflective note-taking and a

reading of all transcripts in their entirety followed by a second note-taking reflection. The

written document was then shared with a qualitative researcher who was familiar with the

primary researcher's beliefs and background knowledge related to curiosity. As an objective

outsider, this colleague was able to point out possible areas of researcher bias. The initial

reflection was then treated as another form of bracketing and a reminder to set aside prior

knowledge and beliefs while grounding the findings in evidence from the data.

The second strategy, member checking, was conducted by sharing the completed

individual structural/textural analysis with each participant in order to ensure the description

represented their experiences and beliefs. As with clarifying member bias, member checking

helped ensure that the findings represent the participants' views rather than the researcher's

(Creswell, 2013).

Finally, the researcher conducted several peer reviews by asking colleagues to play

"devil's advocate" as the researcher and colleague reviewed the data together (Creswell, 2013).

This strategy enlisted others to ask questions that required further analysis, reflection, and

defense of generated themes and descriptions of the phenomenon. This process occurred

throughout the study, beginning with the creation of the interview protocol and continuing to the

final description of the essence of the phenomenon.

Reliability Strategies

Although reliability is typically affiliated with quantitative research, reliability can be

enhanced through intercoder agreement (Creswell, 2013). Creswell defined reliability as "the

stability of responses to multiple coders' data sets" (p. 253). Intercoder agreement can occur at

different points in the data analysis process. During the first step of analysis, three different

collaborators (doctoral students) checked intercoder reliability by highlighting the relevant

statements and recording invariant constituents of three transcripts. A discussion of the

differences provided greater ease in coding the remaining transcripts. A second reliability check

occurred during the thematizing stage of analysis. In order to assure that the themes represented

the textural and structural descriptions of participants' transcribed experiences, a researcher

familiar with coding protocols reviewed and generated themes for three of the transcripts. The

themes were crosschecked and compared with themes generated by the researcher until

agreement was met. Finally, during the reduction stage of analysis, the researcher and another

expert collaboratively analyzed the initial themes, reducing them to seven by regrouping and

rearranging similar subthemes into one subtheme.

<u>Positionality</u>

The researcher's position as an associate director of an initiative at the university may

have influenced participants' responses. In order to diminish the impact of the position, the

researcher made some deliberate choices to increase prospective teachers' comfort level based on

recommendations by Moustakas (1994). The researcher met participants in an informal room in

which the private office was located. The room was designed as a comfortable meeting space

where snacks and coffee are offered to visitors. Furthermore, the researcher chose to conduct the

interview using a casual tone that relied less on the protocol and more on listening and

responding to participants' statements. While these measures did not change the reality of the

gap between roles (that of associate director and that of undergraduate student), the participants

appeared to have little reservations about sharing personal information.

The Researcher

Prior to conducting a qualitative research study, it is important to acknowledge the researcher's background, assumptions and expectations because it increases transparency and objectivity (Bloomberg & Volpe, 2012). Therefore, the following section includes background information that led to the researcher's interest in studying curiosity. It is followed by a description of the bracketing process. Through the bracketing process the researcher's assumptions and expectations related to curiosity were revealed and are shared at the conclusion of this chapter.

A research study often begins years before the actual study is developed and conducted. Acknowledging the researcher's background, assumptions, and expectations prior to conducting the study increases transparency and objectivity (Bloomberg & Volpe, 2012). As researchers, we are the sum of our experiences and we bring our experiences, along with a unique perspective, to our research. Although rigor is increased when we bracket and put aside our biases, we can never divorce ourselves from our prior experiences. Therefore, it is important to understand the perspective of the researcher so that it does not influence the interpretation of the results. This current study unofficially began years ago when the researcher was an elementary teacher and continued to develop as she worked with adolescents and adult learners.

Perspective and Credentials

The researcher chose a career in teaching because of her strong desire to positively impact children's emotional as well as academic well-being. Her initial certification was in exceptional education and her graduate degree was in counseling. Throughout her career, she sought additional certifications that included elementary education, reading, English as a second

language, National Board Certification in early childhood, and a master's degree in school counseling. Her choice to continuously further her education is relevant to her perspective as a researcher because it demonstrates her personal pursuit as a life-long learner and a bias towards believing that fostering this desire in students is one of the goals of education and teaching. Therefore, her decision to pursue a study on the construct of curiosity was partially driven by a desire to foster her own curiosities.

During her teaching career in both elementary and secondary education, she valued students' questions, which was likely influenced by her own desire to ask questions and pursue knowledge. Her experience as an elementary educator occurred before NCLB was enacted. She took for granted the professional autonomy that existed and created classroom environments in which students were encouraged to ask questions and were given ample opportunities to pursue answers. She assumed all children had questions and encouraged questioning among her students. This was evident in a lesson she videotaped and submitted as a part of her portfolio for National Board Certification. During a 15-minute science lesson she prompted student learning with seven questions while students posed over 40 curiosity type statements and questions.

After a nine years hiatus from K-12 schools working for a grant at a large university, she joined the staff at a high school as a reading coach. During this time, she was perplexed by the lack of questions initiated by students and what seemed to be a lack of intrinsic motivation to learn. This experience ignited her desire to understand what happened to their curiosity. She questioned whether curiosity naturally diminished as students aged and the extent to which secondary practices may be at least partially to blame.

During this time, she initiated a conversation with a class of 9th grade students on the topic of curiosity. She shared with them that curiosity-type behaviors appear to diminish as students get older and she wanted to know their thoughts. Several students shared they had little left to be curious about. As one student put it, "When we were little we didn't know much so we were curious, but as we got older there's not as much to be curious about because nothing is new." The majority of the students appeared to believe they already knew most of what there is to know and had little awareness of what they didn't know. These students were no older than fourteen. In their minds, there was nothing new to spark their sense of wonder or ignite their desire to question and seek new knowledge.

The insights the students shared, along with the lack of curiosity type behaviors she observed, may have left her hopeless if it hadn't been for one particular student. Joshua was failing almost all of his classes including remedial reading. Yet, he frequently posed questions that prompted thinking and warranted further exploration. On a few occasions, the researcher found hand-written questions on pieces of scrap paper on her office desk written by Joshua and followed by the statement: think about it. His behaviors raised the possibility that perhaps curiosity had not been destroyed but laid dormant among many students, even adolescents.

The researcher's final year in the K-12 system brought her back into elementary schools as a district coach serving schools that were labeled as high need based on the state's accountability system. She was dismayed by the lack of questions and intrinsic motivation observed in students as young as seven years old. Curious to figure out what happened, she implemented, on a small scale, some simple practices that had fostered curiosity in elementary students during her prior years as a teacher. She was relieved to find that students were still

curious but frustrated by a system that did not encourage fostering students' curiosity. It was

then that she decided to pursue a doctoral degree in education.

During her initial pursuit of research, the researcher was hungry for knowledge about

anything curiosity-related. She came upon two pivotal scholarly articles. The first study

included a comprehensive review of the literature on curiosity and the author's reinterpretation

of prior theories (Loewenstein, 1994). The information provided a foundation for understanding

how curiosity has been conceptualized. The second piece described a researcher's attempt to

collect and analyze curiosity-type behaviors among school-age children (Engel, 2011). Engel's

observations of children corroborated her own observations: curiosity-type behaviors even

among young children were almost nonexistent. Additionally, practices that squashed curiosity

were more frequently observed than practices that fostered curiosity. This prompted her to

wonder about the extent prospective teachers would be prepared to foster curiosity in their future

students. An investigation of prior experiences and future teaching behaviors led her to research

on the concept of *apprenticeships of observation* and evidence that lived experiences,

particularly school experiences, influence teaching beliefs and practices (Lortie, 2002).

Bracketing

The above account of the researcher's journey that led to the study of curiosity is one

method for bracketing beliefs prior to beginning a study. In keeping with the tenets of

phenomenology, bracketing is recommended because it allows the researcher to separate or set

aside any prior knowledge and biases, thus allowing the voices of participants to emerge from

the data (Moustakas, 1994). Researchers are advised to participate in bracketing prior to

beginning their study and continuously throughout the study as data is gathered and analyzed

(Moustakas, 1994). Therefore, prior to beginning the current study, a colleague interviewed the researcher on the reasoning behind the choice of research topics, as well as the researcher's current understandings, beliefs, and assumptions related to curiosity. A transcription of the entire interview is included in Appendix D. Bracketing for a particular study does not end until the study is complete. Therefore, the researcher kept a journal throughout the process to record assumptions, thoughts, and reflections. Finally, the researcher used the process recommended by Moustakas (1994) for analyzing transcribed data from interviews to analyze the researcher's own bracketing data. The process included analyzing specific statements in order to identify overarching themes. The analysis revealed the beliefs and assumptions that follow.

Beliefs and Assumptions

An analysis of the interview transcripts used for bracketing generated the following beliefs and assumptions.

- A desire to learn is innate and fueled by curiosity.

- Curiosity is an innate trait of all humans although it may exist in varying degrees.

- Curiosity propels exploration and learning. Without opportunities to explore, learning and development can be thwarted.

- Some people might be curious but their curiosity may not be visible because they choose not to explore, conditions diminish their desire to explore, or their exploration is invisible.

- Curiosity is influenced by environmental factors and significant others. Motivational factors are intertwined with curiosity.

- There are different types of curiosity and different states that vary among individuals. A stimulus that sparks curiosity in one person may not spark curiosity in another person.

- Certain conditions may influence curiosity negatively.

- Curiosity is caused by a desire to close a gap in knowledge. When people experience curiosity, they experience different emotions. These emotions are influenced by the size of gap in knowledge, desire to know more, and opportunities to explore.

- Fostering curiosity is not a priority in schools especially as students get older. Therefore, the assumption is held that traditional college freshmen pursuing an education major will not recall many school experiences that sparked their curiosity.

In order to reduce bias and strengthen the rigor and findings of this study, the documents used to bracket the researcher's assumptions and beliefs were crosschecked periodically as the interview transcripts of participants were analyzed.

Anticipated Outcomes

Based on prior background knowledge and experiences, it was anticipated that participants would recall curiosity experiences that varied but primarily centered on understanding people. It was also anticipated that the majority of their experiences would have occurred as a result of activities unrelated to their formal schooling experiences, especially secondary experiences. The one caveat that was anticipated was that students pursuing a secondary education major might recall more content-specific school experiences that sparked their curiosity than students pursuing an elementary education major. Additionally, it was anticipated that the participants' lived curiosity experiences would include individuals who modeled their own curiosity, encouraged questioning of the participant, and provided an

environment that participants believed to be safe and nurturing. Finally, it was anticipated that

the participants' extent of curiosity would be greater than what was observed and reported from

observational studies that have taken place in school settings.

To summarize, the researcher's prior experiences and beliefs related to the construct

under study were acknowledged prior to collecting data through the process of bracketing. This

process assisted the researcher in temporarily setting aside prior assumptions so that participants'

perspectives were captured and shared with as little researcher bias as possible (Moustakas,

1994). This process is especially important when conducting a phenomenologically-based study

(Moustakas, 1994).

Conclusion

The methodology chosen to guide this study was qualitative and guided by the tenets of

phenomenology. Therefore, each component of the study was designed to capture the

perspective of the participants. The participants were chosen using purposive and criterion

sampling procedures in order to obtain a fairly homogeneous sampling group. In keeping with a

phenomenological framework, indepth interviews were conducted in order to gain rich

descriptions of participants' experiences. The data was analyzed using the steps recommended

by Moustakas (1994). The verbatim transcriptions were coded and thematized to capture the

structural and textural descriptions of participants' curiosity experiences. Several steps were

taken to ensure the rigor of the study. The researcher considered how her positionality might

impact the data and made adjustments to minimize the impact. Furthermore, the researcher

participated in several bracketing strategies at the onset of the study and continued to cross-check

the findings with her prior beliefs and assumptions. The researcher's adherence to following the steps and guidelines for a phenomenological study recommended by Moustakas (1994) helped ensure the rigor of the study and the value of the findings for others.

CHAPTER FOUR: RESULTS

Organization of Chapter

Chapter four is dedicated to reporting the findings after an analysis of the 13 verbatim transcripts of traditionally-aged freshmen pursuing an education degree. The reporting of the results includes a composite of themes and subthemes and a composite structural/textural description of the essence of participants' curiosity experiences. The essence of the experience conveys the overall meaning of the experience as conveyed by the participants as a group. Also, a table depicting the themes and subthemes extrapolated from each transcription is included. This chapter ends with a review of the research questions and an explanation of the findings related to each question.

Textural/Structural Descriptions

Moustakas (1994) recommended analyzing for each individual participant the invariant constituents (meaning units) and themes extrapolated from the transcripts in order to generate a textural description of the experience. The question the researcher kept in mind during this process is: what did the participants experience (Creswell, 2013)? Following the textural description, the researcher generates a structural description for each participant. The question the researcher keeps in mind during this process is: how did the participants experience the phenomenon in terms of the conditions, situation, or context (Creswell, 2013). The textural and structural descriptions were then combined and reported for each individual participant.

Composite Themes

The result of the analysis of the data is represented by seven composite themes. The themes were extrapolated from the invariant constituents identified in the transcriptions, along with the textural/structural descriptions of each participant's experience. The themes generated from the 13 interviews are as follows:

1. Curiosity is dependent on exposure to novel information, ideas, or events or new ways of perceiving information, ideas, or events.

2. Objects of curiosity are directed towards people, along with references to self, social sciences, religion, and trivial events and objects.

3. Experiences of curiosity are associated with influential individuals who provide exposure to novelty, encourage autonomy, share similar curiosities, and foster a relationship based on trust.

4. Curiosity is manifested in social interactions and independent physical or mental activities.

5. Curiosity is sparked in and outside of school contexts.

6. Curiosity prompts internal states (incongruity, intrigue, dissonance) and feelings (excitement, frustration, anxiety) that are both positive and negative.

7. Motivations to explore objects of curiosity are intrinsic.

Description of Composite Themes

Reported below are descriptions of the composite themes extrapolated from the analysis of the 13 transcribed interviews. They include verbatim examples that identify what the

participants' experienced in regards to curiosity, along with the conditions and context in which their curiosity was experienced. An explanation of the seven themes, along with direct quotes from participants' descriptions of their curiosity experiences, is shared below. Additionally, the table depicting the demographic information for each participant is provided as a reference. All names were changed to maintain confidentiality.

Table 2. Demographics of Participants

	Gender	Race/Ethnicity	Intended Major	Birthdate	Schooling
Addie	Female	White	Social Science	02-18-97	Public/Private
Alanna	Female	White	Math	05-07-97	Public
Aubrey	Female	Hispanic	Elementary	11-27-96	Public/Charter
Blake	Male	White	Music K-12	02-07-97	Public
Chloe	Female	White	Elementary	09-09-96	Public
Eden	Female	Hispanic	Early Child	12-16-96	Public
Isaac	Male	White	Math	2-17-97	Public/Charter
Ivy	Female	White	Elementary	1-5-96	Public
Joy	Female	White	Elementary	7-3-96	Public/Private/ Home School
Quinn	Female	White	Elementary	11-14-96	Public/Private
Rochelle	Female	African American	Early Child	5-15-97	Public
Remi	Female	Hispanic	Early Child	4-17-97	Charter
Riley	Female	White	Elementary	6-9-96	Public

Theme 1: Novelty

Curiosity is dependent on exposure to novel information, ideas, or events or new ways of perceiving information, ideas, or events.

A common theme among all 13 participants was that in order for curiosity to be sparked, they required either exposure to novel information or a novel perspective of existing information. The source and type of novel information that sparked curiosity among participants varied. The

novel information came in the form of an object, experience, or idea. For example, Remi described how a light inside her car turned on while she was driving. The light, unnoticed prior to this event, sparked her curiosity to find out more about her car. Aubrey described a family trip to Cuba that sparked her desire to understand the living conditions of others and to eventually volunteer to do community service. Addie described a roommate with whom her political and religious philosophies vastly differed from her own. Their differences sparked her curiosity to understand her roommate's beliefs and actions.

Furthermore, the novel information was typically connected to the ensuing object of participants' curiosity, which ranged from trivial topics (the meaning of a word) to existential topics (the meaning of religion). Sometimes the novel information was the acknowledgment of an upcoming event. In many of the participant's stories the event was high school graduation that sparked curiosity about self and future. For instance, Aubrey stated, "I was always curious about my life after high school, if I chose the right career, even though I love teaching."

Often the content was not novel but rather it prompted a novel perspective. Below Quinn shared how her English teacher provided a new perspective about a piece of literature.

> She would like pull apart the smallest little things and like I would have never have thought of that so when you start thinking about it. Like what else is there that I'm missing out on because I'm not picking up on them?

Some of the participants described how their curiosity, initially sparked by novel content, was maintained because maturity continuously provided a different perspective of the original content. Below, Riley explained how her perspective changed on the events of 9-11.

Yeah, it's kind of like when you, like every year you watch the towers fall on 9-11. It's like I know what's going to happen at the end of this documentary. I know the outcome. I've probably watched this three times already. But I still like to just feel like I'm learning more about it even though I'm probably, it's just the same thing. I feel like each year I'm older, so like at first I didn't really understand it.

While maturity can certainly prompt new ways of perceiving familiar information, Addie's own self-defined "obsession" with the Kennedy family was continuously fueled by a variety of sources that constantly updated her knowledge base with novel information about the Kennedys. Addie stated:

I'm obsessed with The Kennedy family. That's like my favorite history I think. And I love them and I watch every documentary I can and I read probably like thirty books on them. That's like my thing I'm really curious about all the time. 'Cuz I feel like I don't ever know enough.

Lastly, participants were either exposed to the novel information by an external source or they personally pursued novel information. Below Riley described how her grandfather prompted her curiosity about informational text.

So every day we would go to the library and he would pick out a book and I would pick out a book and after that we would go to Chik-Fil-A. I would not be as entertained by history if it wasn't for him and all his stories and him getting excited. Like when we would go to the library. At first he would let me read a funny book. And then he would say, "Well why don't you read this book?" And it would be an informational book.

Popular external sources for novel information included movies, commercials, books, and websites. Media, especially the Internet, provided continuous access to novel information even when that was not the intent. Isaac shared what happened when he noticed an online link about familiar people.

Like the thing with the Fine Brothers and how they're trying to copyright a certain word like in the context of making videos… and I was already familiar with what the Fine Brothers make and I was like, oh, what's this (trending)? And then just sort of stumbled on this controversy that they were involved in.

While neither Aubrey nor Isaac actively sought novel information, a few participants appeared to seek information in order to fuel their desire to reach a curious state. This was especially true for participants who expressed a strong intensity or desire to know. For example Quinn sought information about strangers by eavesdropping in order to fuel her curiosity about people. Quinn shared:

Like I'm a people watcher like, Quinn, pay attention. What are you doing? 'Cuz I'm just, not in a weird way, but it's just like interesting to me being able to see people's moods and stuff like that so I'm like really curious when it comes to people like even people I don't know.

Addie deliberately sought novel information from the Internet in order to feed her desire for understanding differences among people.

I mean there's always like research on like the Internet and stuff like that and I will like, go off of that to ask questions and look up, if I'm like interested in something, I'll go and look it up and kind of gain knowledge on it and then I'll go talk to them. Oh, well I

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read this. Is this the way you feel? Like, just that kind of stuff or did you hear about

this? What are your opinions?

In summary, novel information or novel perspectives were part of participants' textural

descriptions; they are descriptions of what participants' experienced. People and media were

responsible for exposing participants to novel information or novel perspectives. People

included relatives, friends, and teachers. Descriptions of how novel information or perspectives

triggered curiosity were abundantly found throughout every transcription. Novel information

propelled the reading process and motivated Joy to read a 72-page book on George Washington

as a third grade student. Documentaries, books and people kept Addie's curiosity about the

Kennedys alive. A link that popped up while searching the web prompted Isaac to seek more

information. Meeting for the first time a lesbian female with dyed red hair prompted Addie's

curiosity to learn more about her. Going to church for the first time, prompted Joy's curiosity

about religion, and reading survival stories from victims of the Holocaust and 9-11 raised

questions like "How can I be stronger?" Finally, being thrust into a situation that contradicted

his faith prompted Blake to search for understanding. Exposure to novel information or novel

perspectives ignited and propelled the curiosity experiences of all participants.

Theme 2: Objects of Curiosity

Objects of curiosity are directed towards people, along with references to self, social sciences,

religion, and trivial events and objects.

Participants' stories included descriptions of the objects of their curiosity. Objects of

curiosity typically varied among individuals but included content that fell under the umbrella of

social sciences, physical sciences, life sciences, and interpersonal and intrapersonal concepts.

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People were the object of curiosity to varying degrees for all of the participants. Sometimes the people were familiar, such as family members, friends, and teachers. Other times, they were strangers, historical figures, or distant relatives. Participants' curiosity about people was most often aimed at understanding their behaviors or perspectives. This was especially true when individuals' behaviors were out of character, perplexing, or different from the participant. For example, Ivy's description of her curiosity disclosed how her roommate's unstable emotions sparked her curiosity about what she was going through and Joy's description revealed she was perplexed by her uncle's odd comments he posted on Facebook.

While the behavior of relatives and friends were often the object of participants' curiosities, teachers received a great deal of attention. Joy wondered why her teacher would ask her to write about something of such a personal nature that she wouldn't even share with her closest family members. Although Chloe didn't have a specific teacher in mind, her general curiosity about people compelled her to stay after school to get to know her teachers. Chloe stated:

> I've always been one of those students who have really wanted to know who my teachers are outside of the room. I'm pretty much just curious about people because either I want to do what they're doing and I want to find out how they're doing things so I'll like sneak on in their (classrooms) and be like, you know, what are you doing? How are you doing this?

In contrast, Quinn's curiosity encompassed a broad span of people that included strangers. She stated, "I'm a people watcher like not in a weird way but it's just like interesting

to me like being able to see people's moods and stuff like that so I'm like really curious when it comes to people like even people I don't know."

When religion became the topic of participants' curiosity experiences, the focus was primarily centered on understanding the religious views of someone they knew. Joy contrasted her Christian views with the atheist views of her boyfriend. She shared:

I want to understand what he means because to me it's like I don't understand how you think that once we're dead, we're just gone. I want to understand why you do the things you do – why you feel how you feel.

Chloe's curiosity centered on the different religious paths her divorced parents took. In reference to her parents, she stated, "Why are you guys like this? It's just weird how different they are because they both have such different like views on their religion."

However, sometimes curiosity about religion was directed towards understanding self rather than others. For example, Blake would seek the wisdom of men of faith when faced with challenges. In reference to the men in his life, he stated, "I go to him both her dad about life questions when I'm doubting something. I ask them have they gone through this specific trial or thing because I'm observant and I want to know what other people have gone through."

Conflict and opposing views sparked curiosity to understand others and self. After Joy's father remarried someone with strong religious views, she not only questioned her religious views but also her father's decisions, particularly when he chose to discontinue communication with her. She pondered, what did I do to deserve this? Like, why won't he talk to me, why won't he see me?

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Curiosity about one's heritage was the object of curiosity for Remi and Rochelle. Whereas Remi's curiosity was sparked by a family vacation to Columbia, Rochelle's curiosity about her father and his family was sparked by knowledge of her adoption. Rochelle stated, "I just want to know like the race, you know like what I'm mixed with."

A desire to understand self, specifically one's future, was often sparked by events like high school graduation and going to college. Participants described curiosity about their ability to deal with the challenges of going to college and their decision to become teachers. This was the case for Rochelle and Aubrey. Rochelle stated, "I'm always curious about my future, of course. Like not knowing what path I'm going to go in. I'm always afraid of going the wrong path or not knowing enough." Aubrey shared, "I was just curious about like what I wanted to do after high school. What am I supposed to do? How am I supposed to make my parents proud? Like what is my purpose?"

Closely related to curiosity about people were stories referencing social sciences, particularly historical figures and events. Participants' curiosities reflected a desire to know more about historical figures of whom they already had some familiarity. Alanna picked up a book on George Washington in third grade because she had some prior knowledge of his legacy. Her curiosity about George Washington prompted curiosity about other presidents. Alanna explained that her desire to know more about presidents quickly waned. In contrast, Addie's curiosity about the Kennedys, also sparked in third grade, continued to progress "full throttle" and is still going strong. Addie stated:

Most of my stuff with them, it just kind of blossomed over the years and then once I hit

eleventh grade and I had that class and we focused for a month and it was like, full

throttle. And I loved them.

Historical events often have a lasting effect on nations and people. Therefore, it is not

surprising that curiosity about events like the Holocaust and the terrorist attacked on 9-11

continued to linger for some of the participants. This was the case for both Remi and Riley.

Remi explained:

Like for me, it was just, like why? My questions always was just like, why did this

happen? And my teacher was just like, and he had all this facts and knowledge and he

like loved the history of it and holocaust was his life, 'cuz he was also Jewish so it

impacted him like personally and things like that. But then I was always like why?

Like there was so many questions and I still wonder.

For Riley, it was survival stories that prompted curiosity about people's character. Riley

shared:

I liked learning more about the holocaust and trying to figure out like how someone

could make these decisions, how they survived like on a loaf of bread, hearing the

survivor stories like what they went through and how they came out stronger how

someone could make these decisions.

Sometimes the historical figures and events had the potential to trigger curiosity about

self. Riley continued her story, "How are they different than me? Like how did them going

through that and they came out stronger? How does that different than me going through a failed

test? What in their brain?" Later, when asked if any of her curiosity experiences held special

meaning, Riley added:

> I think, especially with the Holocaust because I suffered depression for a few years so
>
> me reading about how you know, I think her name was Ann Frank, me reading about
>
> her coming out of that stronger was kind of an inspiration that you know, I can, this is a
>
> rut that I'm in but I can make it out of this. So I feel like that was underlying, that was
>
> it but I don't think I realized it at the time. Like I look back now and I think wow, I was
>
> really sad. And I was reading about these other people that had it worse and watching
>
> them overcome it. So I feel like, you know, looking back, secretly I was just trying to
>
> figure out how I could overcome it.

Not all of the curiosity experiences centered on people, self, or the social sciences.

Participants' descriptions intermittently included items that extended into the sciences and arts.

For example, Isaac recalled being curious about dinosaurs and weird animals when he was

younger. More recently, a light on the dashboard that suddenly turned on sparked Remi's

curiosity. Joy's curiosity was triggered by an unknown word and several other participants

described how curiosity propelled their reading of a good book. Sometimes, objects of curiosity

could not be remembered because they were daily but trivial experiences of living in a world

where answers are literally at one's fingertips. Aubrey described her search for trivial

information in the following excerpt.

> I Google things like all the time. Like UCF, what year was it established? And it was
>
> like 1963 I think or something like that. So just little things that come up to me, I'm
>
> always Googling. My history of Google is like, what color is this? I'm for sure, like

always. And if I hear something on TV like I don't get it. I just Google it like oh,

definition of this, or whatever.

In summary, participants' descriptions included objects of curiosity that ranged from

concrete objects to abstract ideas. People, referenced as single subjects or a social system, were

included in every participant's story. At times curiosity was directed towards self and the future.

Less frequently, participants' referenced content related to science, language arts, and trivia

information. Regardless of the objects of participants' curiosity, the attention they received from

participants varied. The objects of curiosity considered trivial received less attention and were

not frequently recalled. Whereas, objects of curiosity that leaned towards existentialism and

objects that held significant meaning for participants received much attention and were more

easily recalled.

Theme 3: Influential Individuals

Curiosity experiences are associated with influential individuals who provide exposure to

novelty, encourage autonomy, share similar curiosities, and foster a relationship based on trust.

References to influential individuals were part of the textural descriptions of all

participants. They played a significant role in fostering participants' curiosity. Their influence

occurred prior to curiosity being sparked and during the phase of exploration. Influential

individuals were common vehicles for exposing participants to novel information, ideas, or

events prior to participants' curiosity experience. Their actions and characteristics created a

climate of trust that fostered curiosity. Consequently, their influence showed up frequently

during the exploration phase of curiosity. During this phase, these individuals were noted for

encouraging autonomy while providing support and guidance and for joining participants in their

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search for answers to their questions. The following descriptions demonstrate the influence

individuals had on the 13 participants' curiosity experiences.

Theme 3A: Novelty

The previous theme included a description of the role of influential individuals in

exposing participants to novel information or perspectives. Therefore, only a brief reference

related to their role is included in this section. The inclusion of the subtheme in this section is to

convey to the reader the wide-ranging influence of individuals and the role they played in

various phases of participants' curiosity experiences. While media also played a large role in

exposing participants to novel information, it takes people, creating media, to make that happen.

Therefore, people, directly or indirectly, were sources for novel information.

Theme 3B: Autonomy

Influential individuals gave participants the space to be autonomous and could be counted

on for support and guidance when needed. They accomplished this by providing participants

with choice and by encouraging them to think outside of the box. This subtheme showed up a

few times in participants' references to religion. For example, Remi described differences

between her friend's upbringing and her own. She shared:

> So it was like forced upon them (friends) so much that her parents were like, we're not
>
> going to force you guys. We'll go, we go during Christmas and Easter but we're not
>
> going to force you guys into something you might not believe…

Rochelle was also provided with choice when she became curious about knowing more

about her birth father and his family. Her mother was supportive but allowed her to make the

decision to pursue more information. Rochelle stated, "It was her choice, not like because of her

(mother). If I wanted to know more and she would like, be okay with it. But like, she wouldn't force it."

Providing participants' choice without demanding or forcing them to take certain actions or stances contributed to states of curiosity. However, influential individuals did not take a hands-off approach. In fact, sometimes participants needed to be pushed into a state that fostered their curiosity. Aubrey was encouraged to pursue college and go out of her comfort zone by her teacher. She stated, "She pushed, like she pushed you to go outside the box." Rochelle credited her mentor in high school for providing support while pushing for independence. She shared, "A mentor, in high school, she just taught me a lot, like the reason I'm here is because of her. So she like pushed me a lot. I had my own parts, but like most of it, she helped me out a lot. She made me think."

Sometimes gentler terms were used to describe how influential individuals encouraged autonomy. Riley's grandfather was credited with playing a very influential role in fostering her curiosity. Below is her description of a conversation with her grandfather.

> He's like, that's your calling. I just never really put it together like it's my calling to actually do that for a living. He never wanted to tell me. He wasn't one of those that say hey, this is what you need to do in life. He wanted me to make that decision on my own and when I look back I'm like, that was him kind of giving me guidance but not pushing me.

Clearly, autonomy and curiosity are related to some extent. Influential individuals fostered curiosity by balancing autonomy and guidance. Riley shared how her volunteer work with autistic children sparked her curiosity in one classroom but not the other.

My first year I worked with a teacher named Mrs. Smith and… Her classroom didn't

really spark an interest. I mean I loved all the students. I loved coming in... But then in

Mrs. Tyler's class you know, she would put me at a table with like three or four people

and have me like, working with different groups, working with different subjects and

then she would give me a, like a science subject and say, "Can you teach this on the

board next week?" And then so after that like that sparked my curiosity. Like why are

people, why are people so mean thinking they can't learn when I'm showing you right

here they're learning?

Autonomy was observed in other subtle ways. For instance, Isaac shared how he was

given the autonomy to choose a topic to write about. This led to what Isaac stated, "I ended up

going past the length requirement. So it was something I liked to do. I think I liked to learn it

because I was curious about the information." Eden was provided a choice of books to read.

Even though she described herself as having challenges with reading, she stated, "If I find

something good like that, I'll be able to read it but I'm like dyslexic and so reading just takes a

lot of time and energy but with a good book I can't wait to turn the page."

As a word of caution, autonomy must be balanced with an appropriate amount of support

in order to foster curiosity. Joy made this point clearly when she shared the following story

about her dad. "My dad, he was not helpful at all. It was just kind of, 'Oh you need to figure

that out on your own.' Which was why I was asking him the questions, because I couldn't figure

it out on my own."

Participants' descriptions of their experiences with curiosity demonstrated the connection between curiosity and autonomy. Influential individuals reportedly knew how to provide the right amounts of support and guidance to cultivate curiosity.

<u>Theme 3C: Shared Questions</u>

The participants' stories of their curiosity experiences validated the social nature of learning. Whether indirectly or directly, people were embedded in the experiences of curiosity shared by participants. Often, people were enlisted to join them in their quest for knowledge and at other times people were natural allies who shared similar curiosities.

Individuals who shared similar questions or curiosities were often the same individuals who supported participants' sense of autonomy. They were relatives, friends, and teachers. For Addie, it was her dad who frequently joined her in watching and discussing documentaries. Although she and her father shared similar objects of curiosity, they did not share the same views, especially with regards to the Kennedy family. Seeking others who shared similar curiosities but different views was a prominent theme found in Addie's stories. Below, Addie shared an interaction with a close friend who shared different beliefs related to politics and religion.

> We have live talks all the time and like we watch the debate together because, we're just like very respectful of each other and I was like asking her like why, like what made you do all this stuff? What instance changed you? And I love hearing about that kind of stuff and she's like the most different of my friends.

Family members were frequently included in participants' descriptions of their curiosity experiences. When Rochelle had questions about her biological father and his family, she went

to her mom whom she described as "having the same questions." When asked if she shared her questions with others, Rochelle replied, "My mom. She did, like with my dad, she wanted to know about him, and she wanted to know like who he was… But she could, she could never figure it out. It's a lot of stuff she wanted to know too."

Curiosity pertaining to family heritage was also the object of curiosity described by Remi. During a trip with family to Columbia, Remi noted the different heritages and became curious about the heritage of her family. She enlisted her family members for help. Below is Remi's description.

> And I would ask my parents and then like, we kind of like, tried looking things up, but since we're, since I'm Colombian and her parents were born there and then they came here. It was harder to find information.

Enlisting others who shared the same or similar questions tended to occur more frequently when answers were hard to find. Both Rochelle and Remi demonstrated how their initial explorations were futile.

Sometimes, participants' questions were unlikely to be answered because participants were uncomfortable approaching the original source. In descriptions like these, participants knew whom to enlist for support. When Ivy was uncomfortable approaching her roommate about her behavior, she enlisted her mom, who shared the same curiosity. Below is Ivy's description of that interaction.

> She (mom) wonders the same thing, like wow, maybe something's wrong with her. We talked about um, me going to the school like counselor, what is it like you can tell them

that someone needs help but you're not anonymous or something. So me and my mom were wondering what, why, what was she thinking?"

Seeking information was often a collaborative effort among friends who had similar questions or needs for information. When the parents of Eden's friends shared they were going to adopt a baby, they were all surprised and perplexed because of the parents' age and the fact they already had four children. Eden shared their reaction upon hearing the news.

When we were I think sophomores in high school, their parents kind of came home one day and were like yeah, we're adopting a child and that just like sparked all of our curiosity. We're like, what is going on like you already have four kids, what are you talking about?

In summary, the role of influential individuals was significant during the exploration process. Participants often enlisted and confided in others who shared similar curiosities. This occurred most frequently after participants' independent searches for answers or information were unsuccessful.

Theme 3D: Relationship

The influence of individuals on fostering curiosity among participants was directly related to the quality of their relationship. Relationships founded on trust encouraged participants to take risks. Participants frequently referenced family members, friends, and teachers when describing influential individuals. They described influential individuals as being open, nonjudgmental, caring, and trustworthy. Their relationship was fostered by mutual respect and equality.

Both mothers and fathers were credited with fostering relationships that made it safe for participants to ask questions and take risks. For both Aubrey and Chloe, their mom was identified as the individual who they trusted most. Aubrey shared, "If I'm curious about something, it depends on what the situation might be that I might talk to someone… the person that I trust the most is my mom, and then my best friend." Chloe stated, "I usually go to my mom for more things than I do my dad because my dad is so like, my mom is more like a friend to me… Just 'cuz my dad just gives me life lectures all the time." Chloe's description provided insight into why she sought support from her mom rather than support from her dad. It appeared that lecturing impeded Chloe's curiosity.

Confidentiality and honesty were valued traits that made it safe for participants to ask questions. Joy's description of her relationship with her mom made this point. Joy shared:

> My mom's always my go to person. Even if it's uncomfortable questions I can ask her whatever I want and she's going to answer. I always know that she's going to tell me the truth whether I want to hear it or not. She's always going to tell me what I want to hear. She's not going to go like, make fun of me or tell other people things I'm saying or doing. Like, we have a very close relationship. And she knows like she can tell me anything and I'm not going to tell anyone and vice-versa.

Fathers also received credit for establishing relationships of trust. Both Blake and Addie described their fathers as individuals who possess the qualities that foster curiosity experiences. Blake often shared with his father questions about faith. He stated, "I have always been able to be open and talk to my dad and share what's going on in my life and ask him for his advice and

he's always been willing to help. He's respected, very knowledgeable, so he's always very understanding. My dad isn't quick to judge people."

Addie chose the term relatable to demonstrate why she and others felt comfortable asking her father questions or advice. Addie stated:

> He is my best friend (dad). I can relate to him in so many ways and I'm so much like him. He's so relatable and he will talk to anyone if you have a problem. And we're just like really close. He's just so open to everybody. And I think that relationship is so wonderful because of that. We have this mutual trust and respect for each other.

In addition to parents, teachers were often identified as influential others. They were portrayed as possessing some of the same traits as the parents described above. For example, Eden stated, "She's so, she's open to us. She's like if you guys ever need anything just come, just come talk to me. We would be able to talk to her about anything." The characteristic of being open was also implied in Chloe's description of her teacher. Chloe shared, "She's just so friendly with everyone. And she kind of like, told us about her life. Like, she wasn't all you know... held back so she really just like let all of us into her life. And that's what made me like, want to ask her questions and feel comfortable asking her stuff."

> Quinn summed up the qualities of her English teacher nicely in the following excerpt.
>
> She was very open-minded. So she was kind of like, not that she would ever cross the line between friend and teacher but she was very good at being both like being there for you for things outside of the classroom as well as inside of it. She was very real. She never put on the teacher mask. Some teachers are very... come off as very put together,

like very open. I'm a person, you're a person. She was comfortable with making

mistakes, didn't put herself above us. We were all kind of on the same level.

Given the strong connection between trust and curiosity, it makes sense that negative

traits or characteristics that define the relationship would adversely influence participants'

curiosity experiences. Below are excerpts from transcriptions that demonstrated this occurrence.

In reference to a teacher, Joy shared how she sought her teacher's support. Joy stated,

"And I confided in her (teacher) but she didn't really seem to pay all that much attention so that's

when I was kind of like, never mind." Remi also made a futile attempt to ask her teacher

questions. She stated, "They (teachers) speak to you like you're an idiot and you're just like...

I'm just asking."

Family members were also noted as negatively impacting curiosity. Joy stopped asking

her father questions after a negative exchange. She shared the following:

> I went directly to him and I would ask him you know, I was like, can we leave the room
>
> because I wanted to talk to him away from everyone. Usually he wouldn't let me talk to
>
> just him. He would have to have his wife in the room to answer her questions for me.
>
> So that made me a little mad. That's when I kind of stopped asking him questions.

Regarding her dad's wife, Joy added, "Because his wife… she was very intimidating to

me. You know, I was a seven or eight year old kid and she would talk down to me."

It is important to note that imparting feelings of intimidation or fear were not always

intentional. Addie explained her fear of asking questions in math.

> Sometimes like with adults, when you want to know something and you're intimidated.
>
> Like one of my, what was it, my math teacher was one of my dad's football coaches

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um, tenth grade year and I wanted to ask him questions but I felt like intimidated

because he was my dad's football coach.

Addie's perception may or may not have been justified. However, her fear that her math teacher might share with her dad something she said prevented her from asking questions.

In Joy's case it was her boyfriend who unintentionally caused her to be uncomfortable. She stated, "I'm uncomfortable 'cuz I can be self-conscience about not knowing big words so… sometimes he'll (boyfriend) kind of like, make it seem, make me feel a little dumb and then I just point it out to him and he's like, aww, it's not what I meant."

In summary, individuals who were positively associated with participants' experiences of curiosity were described as nonjudgmental, open, and respectful. Individuals who were negatively associated with participants' experiences of curiosity were described as judgmental, intimidating and disrespectful. Additionally, fear of feeling judged, embarrassed, or intimidated had a negative impact on participants' motivation to explore their curiosities.

The evidence to support theme three demonstrated the significant role people play in creating conditions that foster curiosity. People were noted for exposing participants to novel information or perspectives and encouraging autonomy before and after curiosity was sparked. After curiosity was triggered, people were enlisted to join participants in their search for answers. Finally, people were vital in creating relationships that made it safe for participants to ask questions and explore the objects of their curiosity.

Theme 4: Manifestation

Curiosity is manifested in social interactions and independent activities.

In all 13 transcriptions, once curiosity was sparked, exploration occurred in some form. The manifestation of curiosity ranged from external social activities (asking questions and discussing) to more independent internal learning activities (thinking and observing). The exploration of the object of curiosity was sometimes transient and at other times lingered for years. The following manifestations of curiosity were extracted from participants' descriptions; asking questions of others, joining a discussion, experimenting, using media, observing, and thinking or pondering.

Descriptions of participants' curiosity experiences were replete with questions. Sometimes the questions were pondered but not shared with others and at other times the questions were the topic of social interactions. Addie was an excellent example of someone who enjoyed engaging in social interactions to explore her curiosity. She shared, "I love talking about stuff that's like my main like way of finding out stuff and when I'm curious, I like getting other people's opinions." Like Addie, Chloe also sought others when she had questions. In the following example, the object of Chloe's curiosity was a teacher. Chloe shared, "So I would always like ask her (teacher) questions, just get to know her and she, to this day she's like my favorite teacher because she didn't just like teach me things in the classroom but she like got to know me and we had a relationship and a friendship."

While asking questions was a direct method for exploring curiosity, engaging in a discussion or conversation with others was a subtler means of exploring curiosities. Alanna's description below is evidence of this approach.

> There's one girl that went to her first high school and we were both waiting for our
>
> parents to come pick us up after school for something and she was into Hinduism... we

just sat down and had our calm conversation like I was curious about. And she was just

saying all these similarities between Christianity and I always thought that they believed

in multiple Gods. She's like, no, we believe in one God, he just has multiple forms or

faces. I was like, that's really interesting.

Manifestations of curiosity through independent activities were common among

participants. Independent activities included observing, searching the Internet, reading, and

watching documentaries. Both Chloe and Blake manifested their curiosity by observing others.

According to Blake, "I'm observant much more than I think people think. I enjoy watching how

they react to things and applying it to how would I react to it not to say judging them but learning

from what they do." Chloe also manifested her curiosity about her father's religious beliefs by

simply observing. She described her observations in the following excerpt.

So like I've gone to church with him. I've kind of like, watched what he, you know,

does every Sunday. I'd have to figure it out myself. They don't really tell me... I kind

of just like watch them and observe what they do. That's why I'm so curious all the

time.

The examples above demonstrated that curiosity could not always be recognized in

others. Manifestations of curiosity were often independently and silently enacted. In fact,

occasionally participants described how curiosity prompted them to simply ponder or think about

the object of their curiosity. For example, Quinn explained:

Yeah, you just like, are thrown in. But it's crazy to think about how like, my mom.

Like they're deaf. Like they don't speak. So like she was born into that like learning

how to speak and I don't know, it's just, it's crazy. I always think about that. But she

had a sister so I always think about that.

The descriptions of curiosity experiences provided by participants were also infused with

examples of using media. Media included books, documentaries, and the Internet. Participants

used media to explore transient states of curiosity and long lasting states of curiosity. Riley

turned to both books and documentaries to satisfy her curiosity. When she wanted to know more

about the brain, she stated, "I just read articles about it but really like how something so, like this

big but it does… The brain amazes me." Riley sees similarities between books and

documentaries and used both for gaining information. She stated:

> It's kind of like a book. That's one thing I like, just getting facts. Like it doesn't even
>
> matter what type of documentary. I like documentaries on tornadoes. I like
>
> documentaries on the war. I like documentaries on how food is made. I just like
>
> documentaries.

Although participants' descriptions were less likely to include searching the Internet for

information, the excerpt below, taken from Aubrey's transcription, demonstrates how media was

used to search for information when the object of curiosity was trivial rather than substantive.

Aubrey explained:

> I Google things like all the time. Like yesterday I was on FaceTime with one of my
>
> friends and he's like, does the comma go after 'but' or before? And I was like what? I
>
> was like, hold on, give me a second. And like UCF, what year was it established? And
>
> it was like 1963 I think or something like that. So just little things that come up to me,
>
> I'm always Googling.

Although not as prevalent, manifestations of curiosity included experimenting or doing. For example, when Aubrey was asked how she obtains answers to her questions, she stated, "I just, I think of answers by doing what scares me the most. Like going away for college. I literally threw up the day of orientation at the bathroom. I had to literally rush to the bathroom and throw up. I was just so nervous."

Typically, experimenting is connected to hands on science activities. These types of manifestations were lacking in participants' descriptions except for a particular experience described by Remi. The context was a family trip in the car when she was a child. The experience was not shared as a response to curiosity but as a side note.

> When I was little I would think like of the clouds…'Cuz I would always lay down in the back seat and my brother would be in the front and my mom would be driving… And I remember, well I would still do it every once in a while, 'cuz I didn't know that the clouds moved. I didn't realize it. I thought I was moving… So I put my finger where the end of the cloud was and I would look up and I would close my eye and I would realize that I was moving.

The manifestations of curiosity described above took various shapes and forms. Participants' descriptions included social interactions and independent physical and internal activities. It is important to note, for every curiosity triggered, participants described a response. Sometimes, participants' desire or urge to know more resulted in brief searches. For others, their search began when they were much younger and continues today. Addie is likely still searching for more information about the Kennedy family. Rochelle is likely still thinking about her biological father. Eden is likely still curious about her future teaching career and Aubrey is

likely still wondering what her purpose is in life. The participants' descriptions illustrate that curiosity sparks thinking, and that thinking is inherent in everything humans do.

Theme 5: Context

Curiosity is sparked in and out of school.

One of the goals of this study was to learn more about the context, including the setting, of curiosity experiences. In what setting were participants' curiosities being sparked, in or out of school? The overarching question that was posed simply asked participants to describe their curiosity experiences. When participants' stories excluded school or home experiences, they were prompted to share a time when curiosity was sparked in the context that was excluded. Only one of the participants described a school experiences at the onset of the interview but four additional participants included a school experience related to academic learning. The objects of their curiosities included the Holocaust, 9-11, the Kennedy family, literature, presidents, and religion. For example, Quinn described her experience with literature.

> Well my English teacher my junior year was like the best teacher I ever had. And I was just like so, like I'm not an English like I'd rather be doing math or whatever. But like I was just like so passionate about like every piece of literature we went through and just like the way I was just like so interested in it and it was like the coolest thing ever to me so it just like made me more curious towards it.

Five participants were quite certain they could not recall any school experiences that sparked their curiosity. For example, when prompted to share a school related experience, Rochelle stated, "I really can't think of any school experiences." Eden shared, "Uh, curiosity? I

don't know, I mean, I think, oh God, this is hard. I mean being in high school, uh… God I'm trying to think of where I'm going with this."

Most interesting, the line between home and school contexts was often blurred. Addie's curiosity about the Kennedy family was sparked by a documentary she saw at home but continued to be kindled by her high school history teacher. Riley's curiosity about people and how the brain works was sparked by a dream about her grandfather but further cultivated by her in-school volunteer work with children with autism and by the content shared during her high school psychology class. The home and school connection was explicitly revealed in one of Riley's stories about a time she spent with her grandfather. Riley shared:

> We would sit on the porch for hours and like one of my favorite stories from him is he would always tell me about when he was in the Air Force. So like I loved getting his first-hand stories and then I would say well this is what we learned in school and he would say, "It kind of happened like that."

Finally, teachers were often included in participants' curiosity descriptions but for reasons that were not directly related to academic content. Instead, they were the objects of curiosity for participants who shared a desire to understand people, or they were influential individuals with whom participants felt comfortable seeking information about nonacademic related curiosities. Ivy provided an example of the former. When asked to share a school-related experience that sparked her curiosity, she stated, "Nothing on top of my head really. I mean, I would want to know more about my teachers but nothing about school. Like I just had a crazy teacher one year and she was really weird." Aubrey shared an example of the latter.

My eighth grade teacher, she sparked it because she's like, you need to look outside the

box. Aubrey, if you need to go away for college you need to like, look into it. It

doesn't matter if you have to take a thousand loans, just take them. Just go out of your

comfort zone.

In summary, participants' curiosity descriptions were referenced both in and out of

school contexts; however, out of school curiosity experiences were more abundantly shared.

School-based curiosity experiences and home experiences were often socially situated but

academic content played a significant role in five of the thirteen participants' experiences. Based

on participants' descriptions, it appears that academic content was more infused in participants'

curiosity experiences when a home connection existed.

Theme 6: Feelings and States of Being

Curiosity prompts internal states and feelings that are both positive and negative.

Curiosity was associated with positive and negative internal states or feelings. Some of

the negative inner states or feelings described or implied by participants' descriptions were

anxiety, frustration, uncertainty, and incongruity. Some of the positive inner states or feelings

described or implied by participants' descriptions were interest, excitement, enjoyment and

relief. The descriptors were either pulled directly from participants' descriptions or extrapolated

and inferred from their statements.

When participants' curiosity was associated with a positive emotion, they often used

general terms to describe it.   For example, in response to exposure to an excerpt from literature,

Quinn stated, "It made me excited. I was definitely like, 'cuz it was new, it wasn't something

like, in English you learn like what's a synonym and like every year it's kind of like the same thing but it's like always something new."

Addie and Riley experienced similar feelings of intrigue and excitement as a result of being exposed to people who either exhibited interesting behaviors or novel features. Upon entering public high school after spending her freshman year in private school, Addie shared:

"I walk in, saw one of my really good friends. She was sitting there. She had bright red hair, like a year ago. She was talking about how she liked a girl and I was like, what did I just get herself into like oh her God."

Similarly, Riley described feeling intrigued by the behavior of strangers. She shared:

It's just interesting to me being able to see people's moods and stuff like that. So, I'm really curious when it comes to people like even people I don't know. If I see like two people arguing or like a couple in the window, I'm always just like eavesdropping.

In contrast to feeling excited and anticipating pleasurable feelings, Aubrey described a feeling of uncertainty as she shared her curiosity about her future. "Stressful. I really do think so 'cuz when you're curious you start asking yourself questions and then I start getting anxiety."

Remi also described similar emotions when her car light lit up on her dashboard. She shared, "Nervous. Because it was just like… What is this? What does it mean? I called her mom and she was like I don't know how to describe it. I don't know."

Understanding participants' feelings or states of being was often a challenge because participants used general terms such as "cool" and "interesting" to describe their emotions. Therefore, it was difficult to garnish what specific feeling or state of being was at the root of their curiosity without making some inferences. Below is an excerpt from Quinn.

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So I think that's what makes me like, curious. Just to like hear, and even just people's struggles, how like, how do you deal with heartbreak, I don't know. 'Cuz everyone is just so different. I think that it's so cool.

Quinn's use of the term "cool" to describe the experience indicates she felt a positive emotion as a result of pondering differences in people. Yet, hearing about people's struggles may have also ignited an uncomfortable feeling that drove her urge to know more.

For Riley, differences seemed to ignite states of perplexity and incongruence. For example, Riley stated, "Like with the Jews, how did they come out of that stronger? How did they not let that belittle them?" Riley compared the strength of others to her own. She later shared:

These people like, just treated like animals and they came out and they just went on with life, like how, what, what in their brain, how are they different than me? Like how did them going through that and they came out stronger. How is that different than me going through a failed test?

Riley's description implied that she was perplexed or puzzled by the differences between her ability to handle challenges and the ability of others. This feeling or state of being prompted her to compare the resolve of others to her own.

While some people may not describe solving math problems as a curiosity experience, Alanna's description included a strong desire, or urge, to gain information. In her case, it was the answer to a math problem.

I mean it frustrates me sometimes but like I just look in the textbook or like... with MyMathLab you can ask for like there's a thing that says, "Help me solve this." And so

I'll go through the example at the computer and what-not or they'll have notes and then if that still doesn't make sense I go to the book and then I can usually figure it out on my own but I guess it's like fun, like a little scavenger hunt.

Alanna's description included feelings of frustration (when she couldn't obtain sought-after information) and feelings of pleasure (when she found the answer). Similarly, when Chloe was asked to describe how she felt when questions about her teachers got answered, she stated, "Good that I finally know. I don't have to be curious anymore. Now I know everything about you."

Finding answers to sought-after questions often resulted in mixed feelings. After pondering for some time why the books she was assigned to read were different than the majority of her classmates, Eden was not quite sure how she felt after learning she had dyslexia. When asked, she stated, "Um, a relief, not a relief but then it was like, oh, this is why I'm slower at reading, this is why I don't comprehend things as quickly as other kids in my class."

Addie felt more certain about feeling relieved when her questions were answered. She shared, "It's like, kind of a relief. Sometimes makes you mad, like if you don't like it."

However, Aubrey's curiosity about her future, accompanied by feelings of uncertainty, may never bring her relief. For Aubrey, there will always be unanswered questions because in her words, "I'm very controlling, very organized so when I don't know what's going to happen I kind of get a little bit of anxiety and I'm like oh my goodness, and I need to know." However, for others, there was often some sense of resolution even when questions did not get answered. When Rochelle couldn't find answers to her questions about her biological father she described moments of acceptance when her curiosity waned but never completely dissolved. Rochelle

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shared, "I mean at times I would get over it but then I would still think about it but I would never try to go further with it. But I would still think about it of course. It would still be in her mind."

Riley shared one of the most innovative responses to how she felt when she was not able to obtain answers to her questions. She responded, "It kind of feels like a dead end like... I'm going to have to make up my own answer."

An excerpt taken from Addie, describing her feelings associated with being curious, best summarizes this section. Of all of the participants, Addie's descriptions of her curiosity experiences were some of the most intense. She stated, "It's just like a thirst, like you just want to know like depending on what it is like it'll drive me insane sometimes."

Although, participants' descriptions of their feelings lacked preciseness, it was evident that they experienced both positive and negative emotions. While the feelings they associated with curiosity varied from mild to intense, the most striking quality was that participants were motivated to pursue information by an intrinsic desire to know more.

Theme 7: Intrinsic Motivation

Motivations to explore objects of curiosity are intrinsic.

Intrinsic motivation has been described as an internal state that drives human behavior (Ryan & Deci, 2000). Consequently, the root of motivation cannot be directly observed. Therefore, the researcher had to infer from participants' descriptions the motivation that drove their desire to explore. In keeping with the tenets of descriptive phenomenology, it was important for the researcher to analyze participants' descriptions by keeping as close to the text as possible (Moustakas, 1994). The researcher identified the presence of the following needs that accompanied participants' motivation to explore: competence, certainty, sense or meaning

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making, congruence, and pleasure. The results of this analysis, along with excerpts from participants' transcripts, are shared below.

Need for Competence

Participants were driven to explore the objects of their curiosity in order to feel a sense of pride or competence. Below is Joy's description of how she felt after learning sign language, an activity that was sparked by observing her mom.

> I felt like I accomplished something. I got something done that I really wanted to do. I guess that's a good feeling. In my class since I had learned some of the sign language, I kind of thought I was a step above. I thought I was a "cool kid."

Although Joy didn't explicitly state she felt proud or competent, her words, "I thought I was a step above" inferred she took pride in her accomplishment. On the other hand, Isaac explicitly identified with a feeling of pride as a result of learning new information about animals. Isaac stated, "I guess, sort of excited and I guess, proud to know this weird information."

Need for Certainty

In contrast to Joy and Isaac, Aubrey associated being curious with negative feelings and states. In reference to how she would describe her feeling of being curious about her future, Aubrey stated, "Stressful. I really do think so 'cuz when you're curious you start asking yourself questions and then I start getting anxiety. Like really quickly I'm like, oh my goodness, what am I supposed to do?"

Aubrey's description indicated she was feeling anxious due to the uncertainty of what she would do after high school. When asked how she resolved her questions, she stated, "I just

jumped in." Aubrey's motivation for "jumping in" appeared to be to relieve her feelings of uncertainty, specifically about the future.

Eden's description of reading a good novel offered similar insights into motivation. She stated, "I don't know just like the curiosity of what's going to happen in the ending or what happens to the characters and how's it going to end I guess. But see that's how, that's what like, gives you the motivation to read, not knowing the outcome."

Eden's motivation to turn the page (explore) was driven by a need to find out what would happen next. Like Aubrey, Eden was motivated by the anticipation of learning the outcome. When the outcome was revealed, uncertainty was diminished.

<u>Need for Sense or Meaning Making</u>

Making sense of situations or events was frequently the motivation for many of the participants. For Ivy, the event was her friend's decision to end their friendship. She stated, "I just couldn't think as to why she would just drop me like that and like not ever talk to me and I wish I had a reason to know why she just decided to stop talking to me but to this day I still don't." Ivy's questions indicated she wanted to make sense or meaning of a situation she didn't understand. Ivy explored her questions with her parents. Her exploration was motivated by a need to make sense of her friend's behavior.

Similar to Ivy, Blake's motivation to explore was driven by a desire to make sense of novel information. Below is an excerpt from Blake's transcription.

> I was raised in a faith with my family so some things in school they teach you about, like evolution and different science subjects, and I'd always go home and ask my dad about that and what we were taught about that in Sunday school and how sometimes in

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the secular world we are taught differently than what we are taught in Sunday school.

So that always interested me.

Although Blake described his curiosity as an interest, the theory of evolution contrasted with his current faith based beliefs and created an inner state of incongruence. Blake's motivation to explore was driven by a desire to makes sense or meaning of the new information.

<u>Need for Pleasure</u>

Motivation was not always ignited by the anticipation of diminishing a negative feeling or inner state of being but also by the anticipation of a positive feeling or inner state of being. In the following excerpt Riley was asked whether or not her questions got answered at the end of viewing a documentary. Riley responded:

Like I don't have more questions I just have more desire to learn more. It feels like, it's a weird feeling. 'Cuz like, sometimes I feel like I really don't need to know. I mean it's not really going to affect me tomorrow if I watch one more documentary. But really like, it's entertaining.

Based on Riley's response, her motivation to watch another documentary was not driven by a need to obtain answers to questions. Riley simply found learning to be a pleasurable activity. Thus, her motivation to watch another documentary was driven by her need for pleasure or entertainment.

As evidenced by participants' descriptions, intrinsic motivation drove their effort to explore objects of their curiosity. Not one participant referenced anticipating an extrinsic reward. This was true for curiosity experiences that were accompanied by negative or positive feelings or inner states of being. Regardless of the type of feeling or state of being, participants

were intrinsically motivated to explore simply because they desired to achieve a feeling of competence, certainty, meaning or sense making, and pleasure.

To summarize the findings from the seven themes, participants' descriptions of their curiosity experiences included details regarding what was experienced and how it was experienced. The seven themes were extrapolated from both textural and structural descriptions. The internal or textural descriptions included novelty, an array of feelings, intrinsic motivation to explore, and relationships that were supportive and nurturing. The structural descriptions included exposure to novelty delivered by media and people in contexts that varied between in-school and out-of-school experiences. Participants' curiosity experiences included influential people who often joined them in their search for knowledge. While there were some variances among the objects of participants' curiosity, all participants described a desire to know more about people. The examination of textural and structural descriptors provided a holistic view of participants' curiosity experiences.

<u>Theme and Subtheme for Each Participant</u>

While the goal of phenomenology is to uncover a composite description of the construct under study, not all participants' descriptions included evidence of each theme and subtheme. For example, some participants found support by collaborating with others in their pursuit of information and some pursued information independently. While some of the participants directed their curiosity towards understanding others, a few participants described an urge to understand themselves. These variances among participants are captured in the table below.

Table 3. Variances Among Participants

	Addie	Alanna	Aubrey	Blake	Chloe	Eden	Isaac	Ivy	Joy	Quinn	Remi	Riley	Rochelle
1. NOVELTY	X	X	X	X	X	X	X	X	X	X	X	X	X
OBJECTS OF CURIOSITY													
a. People	XX	X	X	X	X	XX	X	X	X	XX	X	X	X
b. Self	X		XX	X	X	X					X		X
c. Social Sciences	XX	X								X		X	
d. Other	X	X	X	X		X	X		X	X	X	X	
INFLUENTIAL INDIVIDUALS													
a. Exposure to Novelty	X	X	X	X	X	X	X	X	X	X	X	X	X
b. Autonomy	X		X	X		X	X			X	X	X	X
c. Collaboration	X	X	X	X		X		X	X	X		X	X
d. Relationship	X	X	X	X	X	X		X	X	X	X	X	X
4. MANIFESTATION													
a. Social	X	X	X	X	X	X		X	X	X	X	X	X
b. Independent	X	X	X	X	X	X	X	X	X	X	X	X	X
5. CONTEXT													
a. In-School	X			X						X		X	
b. Out-of-School	X	X	X	X	X	X	X	X	X	X	X	X	X
6. FEELINGS / INNER STATES													
a. Positive	X	X	X	X	X	X	X	X	X	X	X	X	
b. Negative	X	X	XX	X	X	X		X	X	X	X	X	X
7. INTRINSIC MOTIVATION	X	X	X	X	X	X	X	X	X	X	X	X	X

Phases of Curiosity

Identifying and sharing themes extrapolated from participants' descriptions is one method of organizing and making sense of the data. However, for this particular study, this method alone did not convey the complex and dynamic nature of participants' curiosity experiences. Therefore, the results were reorganized to take into account the multi-dimensionality of participants' curiosity experiences.

Prior to data collection, curiosity was initially defined as motivated by a trigger followed by an action or manifestation (Litman, 2005). However, the themes generated from participants' descriptions included events that occurred outside the realm of this definition. For example, theme six revealed that participants' experienced both positive and negative emotions related to being curious. Their emotions were connected to not only the trigger that sparked their curiosity but also to the outcome or resolution of their curiosity. The definition of curiosity that was initially chosen to guide this research did not include a resolution phase. Therefore, it became apparent that the definition of curiosity needed to be expanded to encompass each of the seven themes extrapolated from participants' description of their curiosity experiences.

Some support for organizing the data into multiple phases of curiosity was provided by Arnone et al. (2011). Their definition of curiosity included three phases of curiosity, the trigger, the reaction, and the resolution. Based on participants' descriptions of their curiosity experiences, a fourth phase, titled pre-cursory curiosity, is being proposed by this researcher. This phase disentangles the precursor from the actual state of curiosity, referred to as "true" curiosity Levitt et al., 2009). A four-phase model of curiosity will be used to demonstrate the relationship between the seven themes and the four phases of curiosity. The phases are as

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follows: phase 1: precursory; phase 2: true curiosity; phase 3: exploration; phase 4: resolution. A

chart depicting the phases and the corresponding theme followed by a brief explanation of each

phase follows.

Table 4: Phases and Themes

Phase 1: Precursory	Phase 2: True Curiosity	Phase 3: Exploration	Phase 4: Resolution
Theme 1: Novelty	Theme 6: Feelings	Theme 4: Manifestation	Theme 6: Feelings
Theme 5: Context	Theme 2: Objects of Curiosity	Theme 3B: Autonomy	
Theme 3A: Exposure		Theme 3C: Collaboration	
Theme 3B: Autonomy		Theme 3D: Trust	
		Theme 7: Motivation	

Phase 1: Precursory

Phase one describes the events that occurred immediately before curiosity was triggered.

During phase one, the participants experienced the incoming of novel information or novel

perspectives in which their current knowledge took on new meaning (theme one: precursory).

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The novel information was associated with a variety of experiences that were meaningful and relevant to the participant. These experiences caught the attention of participants and took place in a variety of contexts that included school and classroom settings, vacations, home, and social events with friends (theme five: context). Participants were exposed to the novel information by a variety of different people or media devices (theme three: influential individuals). The people included parents, relatives, friends and sometimes strangers. The media included books, documentaries, and the Internet. Sometimes participants actively sought novelty and at other times they were passive recipients. During this phase, people with whom participants shared a special relationship provided and encouraged autonomy with support and guidance as needed (theme 3: influential individuals).

Phase 2: True Curiosity

Phase two encompassed true curiosity, which was accompanied by either a subtle desire or an intense urge to know more. During this phase of curiosity, participants experienced an inner working system that produced positive and negative emotions or inner states of being (theme six). Sometimes participants experienced this true state of curiosity momentarily and at other times it lasted for years. In the latter case, the participants continuously pursued novel information in order to maintain their curiosity or they took breaks and later revisited the object of their curiosity when it became a topic of conversation or when distance from it provided them with a novel perspective.

During phase two, participants experienced a range of emotions or states of being that later motivated exploration (theme six: feelings/states). Some of the positive feelings or states of being described by participants or inferred from their descriptions were interest, intrigue, and

excitement. Some of the negative feelings or states of being described during this phase were anxiety, frustration, uncertainty, incongruity, and perplexity.

This phase of curiosity was associated with a trigger that focused participants' attention on the object of their curiosities (theme two: objects of curiosity). Based on participants' descriptions, the intensity of their focus varied. Sometimes the focus was sudden and grabbed their attention immediately and on other occasions their attention brewed over time. The objects of their curiosity also varied. However, every participant described at least one experience in which the object of their curiosity was people. Other objects of curiosity fell primarily under the umbrella of self and social sciences. Self-curiosity was noted when individuals had questions like, 'How can I become a stronger person?' Or, 'How effective will I be when I'm a teacher?' Curiosities about people centered on understanding other's behaviors or thoughts, and social science topics centered on events and historical figures. Other examples of objects of curiosity described by participants, but limited to single experiences, were animals, a car light, vocabulary, and the brain.

Phase 3: Exploration

During phase three, participants used action verbs such as, talking, questioning, discussing, acting, observing, watching, and thinking (theme four: manifestation). Participants experienced exploration and searching behaviors that were brief, as in the time it took someone to Google a question, to extending over long periods. Explorations that extended over long periods of time tended to ebb and flow because participants found it difficult to obtain information or their object of curiosity was existential and answers were nebulous.

Participants experienced intrinsic motivation to explore during this phase (theme seven: motivation). The root or core of their motivation was directly related to what they experienced

during true curiosity. If they experienced uncertainty, they were motivated by the need for certainty. If they experienced interest or intrigue, they were motivated by the need for pleasure or enjoyment. If they experienced puzzlement, they were motivated to obtain a solution. If they experienced incongruence or perplexity, they were motivated by the need to make sense or meaning of the object of their curiosity.

During this phase, conditions and support networks played a pivotal role. The participants' descriptions during this phase included both media and people. Participants explored media such as books, journals, documentaries, and websites for relevant information. Media was described as supportive as long as it worked as intended.

Individuals played a significant role during phase three (theme threeL: influential individuals). The people referenced by participants were parents, relatives, friends, and teachers. During this phase, people acted as a support system, joining participants in their quest for information. They often shared similar curiosities and questions. Additionally, significant people encouraged participants to act on their curiosity by providing autonomy with just the right amount of guidance and support. Lastly, the relationship between the participant and influential individual fostered conditions that encouraged and motivated participants to take risks and explore the objects of their curiosity. Participants characterized influential individuals as open, nonjudgmental, knowledgeable, caring, trustworthy, and relatable. Their relationship was described as grounded on mutual respect and trust.

With that said, participants also described individuals who judged, belittled, intimidated, or discounted their effort and discouraged their exploration. These conditions caused participants to be more cautious regarding exploring the objects of their curiosity.

Phase 4: Resolution

During phase four, participants described their feelings and actions when their curiosities were satisfied or left unsatisfied (theme six: feelings/states). When curiosities were satisfied, participants experienced relief, satisfaction, and pride. However, when their curiosities were not satisfied, their feelings or inner states varied. Some participants experienced disappointment, a feeling of giving up, or frustration. Other participants felt a sense of resolve and contentment. When curiosities were unsatisfied, the intensity of participants' emotions was directly related to the intensity of their urge to know.

In summary, the phases of curiosity described above provided a structure for understanding prospective teachers' lived curiosity experiences. Within this structure, the themes that were extrapolated from the data fell into place. Although the data remained the same, organizing the themes by phase presented a more comprehensive view for understanding participants' curiosity experiences than solely providing a list of themes. Integrated within each phase and corresponding theme were participants' textural and structural descriptions of their curiosity experiences. Together, this holistic perspective assisted in understanding the essence of participants' curiosity experience.

Essence of Curiosity: A Composite Textural/Structural Description

The essence, or meaning, of the experience as conveyed by participants is at the heart of a phenomenological study. It takes into consideration the entirety of participants' transcriptions, along with the textural/structural descriptions generated from the invariant constituents and themes. After conducting several rereads of all the data and crosschecking the following description with a researcher and non-researcher familiar with participants' transcriptions, the

researcher determined that the essence of participants' experiences centered on people and emotion. This makes sense given that individuals' ability to recall experiences is made easier when those experiences have emotional ties.

Participants recalled and described prior experiences in which their curiosity was sparked in and out of school settings. The essence of their curiosity was grounded in their social experiences. They were curious about people and people played an influential role in creating the conditions that prompted them to explore their curiosity. This was true regardless of the context in which their curiosity was sparked—from Riley who spent large amounts of time with her grandfather at the library to Isaac who spent his early years making films with his brother at home.

Participants found meaning from curiosity experiences that were shared in both home and school settings with family members, friends, and teachers. The objects of their curiosity often crossed both settings. Curiosity about people was explored at school and curiosity about history was explored at home. Additionally, participants found meaning from their relationships with people in both home and school settings who fostered and supported their curiosities. These influential individuals were valued for creating relationships founded on trust and mutual respect. They were credited with encouraging autonomy, providing guidance, and joining them in their quest for information. They were characterized as caring, knowledgeable, open, nonjudgmental, relatable, and honest.

Participants' descriptions of their curiosity entailed stories of people, and it was those stories that were often highlighted in the descriptions of their curiosity experiences. People, whether they were close to the participant, as in a family member or friend, or distant, as in a

historical figure or individual found on Youtube, were part of at least one, and sometimes all, of theprospective teachers' curiosity experiences.

Participants' descriptions also included curiosity about themselves and questions about their future. Sometimes in their exploration for information, their curiosity brought them back to the stories of people who previously captured their curiosity. By understanding the perspective of others, they were better able to understand themselves.

Even when their curiosity was captured by something seemingly unrelated to people, people remained a part of their descriptions of their experiences - from calling a parent to inquire about a car light to asking a boyfriend about the meaning of a word.

Finally participants' curiosity experiences were saturated with an array of emotions and inner states of being. From the emotions created by close relationships described as loving, caring, and respectful to the self-described and inferred feelings and states of being directly connected to curiosity such as; intrigue, excitement, eagerness, frustration, anxiety, uncertainty, satisfaction, and relief. People and emotions were intertwined with curiosity experiences, thus representing the essence and meaning behind the stories they shared.

<div align="center">Findings of Research Questions</div>

Based on the descriptions of the 13 participants, the overarching research question and three sub-questions were answered. The descriptions of the themes shared above provided a comprehensive review of each question. The overarching question and response focused on the textural descriptions of the participants' experiences. A brief summary of each research question follows.

RQ1: What are the lived curiosity experiences of traditionally-aged freshmen pursuing a degree in education?

The curiosity experiences of traditionally-aged freshmen pursuing an education degree appear to be socially bound. Every participant recalled and shared at least one experience in which the object of their curiosity centered on people and people were credited with creating conditions that fostered their curiosity. Participants' curiosities were sparked as a result of exposure to novel information or novel perspectives and were associated with an array of feelings and inner states of being that were positively and negatively rooted. Their feelings and inner states of being intrinsically motivated them to explore the objects of their curiosity. The resolution of their curiosity was also associated with negative and positive feelings or states of being. When their curiosity was satisfied, they felt relief and pleasure. When their curiosity was not satisfied, they felt a sense of resolve and acceptance.

RSQ1-1: To what extent have they experienced curiosity?

The extent in which traditionally-aged freshmen have experienced curiosity was greater than what was assumed based on the researcher's experience and the results of published studies. All of the participants were able to recall more than a single curiosity experience. Yet, only five shared a curiosity experience related to academic content they were exposed to in school. Furthermore, it was difficult to tell if their curiosity was initially sparked by in or out of school experiences. All participants were able to share curiosity experiences that were triggered in home or community contexts.

RSQ1-2: What factors influenced their experiences?

The factors that influenced participants' curiosity experiences were people and media resources. Media provided exposure to novel information or novel perspectives and access for

exploring participants' objects of curiosity. The influence of individuals on participants' curiosity experiences was even greater. People provided participants with exposure to novel information or novel perspectives. Additionally, people encouraged autonomy and guidance, conditions that cultivated curiosity and exploration. People were often credited with joining participants in their search for information, frequently sharing the same or similar questions or curiosities. Finally, influential people fostered relationships in which trust and mutual respect were formed. Participants described influential individuals as caring, open, nonjudgmental, relatable, knowledgeable, and honest.

RSQ1-3: What meaning do the experiences hold for them?

A final review and reading of all transcriptions was completed and compared to the themes extrapolated from participants' experiences in order to understand the meaning their curiosity experiences held for them. The social and emotional components were clearly valued by participants and embedded throughout the phases of curiosity. Additionally, their curiosity, regardless how trivial, propelled their learning. Sometimes, the results were immediate but at other times not realized by participants until much later. This section ends with a quote from Addie.

> I just think it like helped better me. Like made me a rounder person, like well-rounded
> at least. And through every experience there's a reason why you're put through
> something. Like you might not understand it now but, later on you could literally just
> walk past somebody and you would understand why you went through something. And
> I just think that my curiosity to learn all this stuff will later benefit someone else.

<u>Conclusion</u>

The findings presented in this chapter represent the voices of 13 prospective teachers who will soon be responsible for educating children in K-12 schools. Their stories provided valuable insights into understanding the lived curiosity experiences that may potentially shape their future teaching beliefs and practices. These lived experiences took place in both in and out of school context and were shaped by people who created conditions that fostered their curiosity. They included exposure to novel information and novel perspectives that often directed their curiosity towards a desire to understand people. Their curiosity about people, along with the support they received from others, will likely encourage them to create conditions that have the potential to foster curiosity in their future students. However, it is imperative that prospective teachers continue to experience curiosity in the context of their teacher preparation program, and that they gain the tools they need to deliberately create conditions and implement practices that foster curiosity when they become teachers. If this happens, children's curiosity-type behaviors in school are more likely to increase.

CHAPTER FIVE: DISCUSSION

Purpose

The purpose of this study was to examine and understand the lived curiosity experiences of traditionally-aged college freshmen pursuing an education major so that the knowledge gained can be used to inform higher education teacher preparation programs, support the current body of research on curiosity, and set the stage for new research.

Introduction

In Chapter Four, the results of an analysis of prospective teachers' lived curiosity experiences were presented. The analysis identified seven themes that were embedded within four phases of participants' curiosity experiences. The focus of Chapter Five centers on a discussion of the findings within the context of current literature and implications of the findings for researchers, K-12 educators, and teacher preparation programs. The chapter ends with an explanation of the limitations of the study and suggestions for future research.

Connections to Research

The findings of the current study drew upon seven themes that were extracted from 13 participant interviews. In a review of the professional literature, no other studies were found that focused on understanding and examining the curiosity experiences of prospective teachers. However, there were several conceptual studies and a few empirical studies that provided evidence aligned with the concepts and themes that were identified by this study. In the

following sections of this chapter, the researcher will identify and discuss findings from prior

research that corroborate the findings from this study, beginning with the conceptual

understanding of curiosity followed by the themes in the order they appear in each of the phases

of curiosity.

Definition

The multifaceted nature of curiosity and its similarity to other constructs has presented

challenges for researchers, making it difficult to come to agreement on how to define curiosity

(Jirout & Klahr, 2012; Loewenstein, 1994). Therefore, it was not surprising that participants

faced similar challenges when asked to share a time they experienced being curious. Many of

the participants demonstrated doubt regarding the appropriateness of their responses to the

interview questions, with some seeking clarity, while others having difficulty recalling curiosity

experiences. The results of this study corroborate the need to clarify what is meant by curiosity.

Interest and Curiosity

The challenges presented by not having a clear definition of curiosity were amplified by

the overlap between the constructs of *curiosity* and *interest*. The strong association between

these two constructs was evident in participants' responses, with several participants making

references to interest in their accounts of curiosity experiences. Researchers have also made

similar references and often referred to the two as interchangeable constructs (Grossnickel, 2016;

Kashdan & Fincham, 2004; Litman & Jimmerson, 2004). Adding to the confusion, curiosity

associated with pleasant feelings has been labeled *interest-type epistemic curiosity* (Litman &

Jimmerson, 2004). While several researchers have attempted to untangle the constructs of

curiosity and interest, more research needs to be conducted (Grossnickel, 2016). The data

provided by this study may provide a resource for future researchers interested in taking on this initiative.

<u>Phases of Curiosity</u>

Prior to collecting and analyzing the data, the curiosity experience was tentatively conceptualized for the purpose of this research as having two components, a trigger that sparks the urge to know more, and a reaction that is manifested through external and internal activities (Litman, 2005). However, an analysis of participants' descriptions of their lived curiosity experiences provided a broader view of curiosity. Rather than two components, the data revealed evidence of four components, or phases, of curiosity. Three of the phases were included in the definition of curiosity proposed by Arnone et al. (2011). Based on the data extrapolated from participants' descriptions, this researcher proposes a fourth phase, *precursory*, to describe the conditions in place before participants felt an urge to know more. Delineating curiosity experiences as a set of four phases allows researchers to examine and understand a specific phase or all four phases as a whole. The researcher will review and connect prior and current research findings from the lens of the four phases of a curiosity experience.

<u>Phase One: Precursory</u>

Phase one encompasses precursory experiences prior to an individuals' desire or urge to know more. These experiences, as described by participants, included exposure to novel information by individuals and media in and out of school contexts. The three themes below were extrapolated from the data and were evident during phase one and will be discussed in detail in the following section. The themes are:

Theme 1: Curiosity is dependent on exposure to novel information, ideas, or events or new ways of perceiving information, ideas, or events.

- *Theme 3, A and B: Experiences of curiosity are associated with influential individuals who provide exposure to novelty and encourage autonomy.*

- *Theme 5: Curiosity is sparked in and out of school contexts.*

Both empirical and conceptual research studies have corroborated the clear connection between novelty and curiosity (Berlyne, 1966; Endsley, 1979; Loewenstein, 1994). Loewenstein (1994) has argued that curiosity is triggered by an awareness of a gap in knowledge and proposed that exposure to novelty continuously propels this information gap. For example, researchers have found that intriguing toys and friendly people can persuade toddlers to leave the side of their parents to explore these novelties (Eckerman & Rheingold, 1974). In addition, other findings have indicated that school-age children are immediately drawn to novelties in the classroom as well (Engel, 2011).

The descriptions of curiosity experiences provided by participants corroborated the relationship between novelty and curiosity. Throughout each of the interviews, participants described stories about times they were exposed to novel information or prompted to consider a novel perspective that triggered their curiosity. Joy described how she became curious about religion after attending church for the first time with her father. Aubrey explained how her English teacher prompted her curiosity by exposing her to a novel way of thinking about literature. While some participants intentionally sought novelty, often the media and other people provided participants with exposure to the novel information or perspective.

Theme 3A: Exposure

While it was evident that novelty played an influential, if not necessary, role in sparking curiosity, research was scarce regarding the method in which individuals came in contact with novel information or novel perspectives. It is generally understood that prior to entering formal

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schooling, parents are primarily responsible for providing a continuous supply of objects that pique curiosity and exploration among infants and toddlers. However, Samuels (1980) discovered that older siblings also provide a conduit between their younger siblings and novel stimuli. Furthermore, the recent proliferation of media devices has provided young children with an array of novel information. Many children today are comfortable and adept at using smart phones and tablets to access games, books, and videos before they enter formal schooling (Plowman, McPake, & Stephen, 2008).

The descriptions of participants' lived curiosity experiences also included media and people as vehicles for obtaining novel information. Media included books, documentaries, and the Internet, whereas people included family members, teachers, peers, and strangers. For the majority of participants, novelty was not deliberately sought; rather, participants were inadvertently exposed to novel information. For example, Isaac's curiosity was sparked by a pop-up displayed on his computer, and Joy's curiosity was piqued when she observed her mom using sign language. On the other hand, some participants deliberately and actively sought novel information or novel perspectives. For example, Addie searched the Internet for the latest information on politics and then sought others for a discussion on the topic. A closer examination of the differences between curiosity experiences that were actively sought and experiences that were not sought might provide insights into the different types of curiosity.

Theme 3B: Autonomy

Exposure to novel information was enhanced when individuals were given autonomy to explore. The condition of autonomy is believed to be a precursor to curiosity by researchers noted for their expertise of curiosity (Kashdan & Fincham, 2004). This theme was evident in both participants' descriptions and in prior research. Prior to entering formal schooling, young

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children are given a great deal of autonomy to explore their environment. However, after entering formal schooling, their autonomy and time for exploration dramatically decreases along with their curiosity-type behaviors (Engel, 2011). Engel and her student, Hilary Hackmann demonstrated what happens when children are given autonomy to move about a classroom. Children were more likely to examine a curiosity box deliberately placed in the room than students who were not given similar autonomy. The relationship between autonomy and curiosity was also evident in the descriptions of participants' curiosity experiences. Ivy volunteered in two different classrooms in which both teachers taught students identified as having Autistic Spectrum Disorder (ASD). However, it was not until Ivy worked in the second classroom that she felt her curiosity was sparked. Ivy credited the teacher of that classroom for giving her the autonomy to plan and deliver instruction. Ivy's experience, along with prior research, suggests that autonomy has the potential to provide a fertile ground for curiosity to flourish.

Theme 5: Context

Once children enter formal schooling, it becomes difficult to pinpoint the context responsible for sparking their curiosity. Understanding the context in light of the research on lived experiences and future teaching beliefs and practices is important because research indicates prospective teachers' apprenticeships of observations in-school, and possibly out-of-school, influence the types of beliefs and practices they will employ as teachers (Lortie, 2002; Smith, 2005). However, little is known about the extent curiosity is fostered in or out of school. The scant amount of research available indicates that children are given few opportunities to explore the objects of their curiosity during their time in school (Engel, 2011). Research on the extent curiosity is fostered at home or the community has been primarily regulated to young

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children prior to their entrance into formal schooling. Therefore, comparisons between the two

contexts have not been possible due to a lack of available data.

On the other hand, the current study elicited descriptions of participants' curiosity

experiences occurring in and out of school. Although out-of-school experiences were more

frequently shared than in-school experiences, both settings created conditions that fostered

curiosity. However, it is important to note that academic content was much less likely to spark

curiosity than social content even in the school setting. For example, eight of the participants

could not recall a school experience related to academic content that sparked their curiosity but

three of the eight participants described a social experience in school that triggered their

curiosity. While all of the participants were able to describe curiosity experiences that were

sparked in the context of home or community, some of the participants described academic

content that crossed both school and home contexts as well as interpersonal and personal content

that crossed both contexts. The curiosity experiences linked to academic content shared a home

and school connection that made it difficult to determine in which context curiosity was initially

sparked. This finding is important because it demonstrates the power of home/school

connections in reference to curiosity.

To summarize, phase one encompassed the conditions that planted the seed for true

curiosity. These conditions included exposure to novel information or novel perspectives in

contexts that included both school, and more often, home environments.   The conditions were

further enhanced when autonomy was encouraged and provided. Prior research corroborated the

three themes aligned with phase one to varying degrees. Theme one (novelty) gained the most

attention from prior research. However, none of the prior studies reviewed sought to understand

how individuals were exposed to novel information or novel perspectives. Less attention was

given to theme 3A (autonomy) and theme 4 (context) by researchers. However, the connection between curiosity and autonomy proposed by Kashden and Fincham (2004) gained enough support from the current findings to warrant future research. Furthermore, the findings from this study and from the study conducted by Engel (2011) provided some evidence that curiosity may be sparked in the school context but is less likely to be manifested.

Phase Two: True Curiosity

During phase two, true curiosity was experienced. True curiosity is evident when a positive or negative feeling or inner state is coupled with an urge to know more (curiosity) and focus is directed towards the object or phenomenon that sparked curiosity (Berlyne, 1966). The themes that were noted during this phase and that will be discussed in this section are:

- *Theme 2: Objects of curiosity are directed towards people, along with references to self, social sciences, religion, and trivial events and objects.*

- *Theme 6: Curiosity prompts internal states (incongruity, intrigue, dissonance) and feelings (excitement, frustration, anxiety) that are both positive and negative.*

While researchers have found it difficult to measure state curiosity (Naylor, 1981), the data collection methods used in this study produced several rich descriptions of curiosity states. The objects of participants' curiosity varied as was expected because interest naturally varies among individuals (Jirout & Klahr, 2012). However, there were some interesting trends in the data that are worthy of noting. First, every participant shared at least one experience in which people were the object of their curiosity (interpersonal curiosity). Second, several participants described curiosity directed towards self (intrapersonal curiosity). Third, the objects of participants' curiosities were often existential in nature and rarely directed towards trivial objects.

Interpersonal curiosity has been described as a desire to understand people's thoughts, feelings, and behaviors (Renner, 2006). All thirteen participants interviewed for this study expressed a desire to know more about people such as their teachers, friends, family members, and strangers. This was not surprising given that all of the participants chose to pursue a profession centered on helping people. Evidence of interpersonal curiosity was also discovered among children as young as infants and toddlers by Eckerman & Rheingold as far back as 1974. Additionally, Engel (2011) found elementary school-aged children expressed a desire to know more about their teachers (Engel, 2011). Until recently, however, there have been few measurements designed to address and assess interpersonal curiosity. Renner (2006) and Litman (2008) fulfilled a need by developing and validating scales for this purpose. Based on current findings and prior research, there is a reason to believe interpersonal curiosity is prevalent.

In keeping with a focus on people, some participants demonstrated a desire to know more about themselves. Self-curiosity has been described as, "the desire that people have to explore and understand themselves and their psychological functioning beyond what they already know about themselves" (Aschieri & Durosini, 2015, p. 327). Participants expressed an urge to know more about their character and future aspirations. A scale aimed at measuring and assessing self-curiosity was recently developed (Aschieri & Durosini, 2015). The addition of interpersonal and intrapersonal curiosity scales has the potential to broaden and deepen our understanding of curiosity.

While conducting the interviews, the researcher noted that many of the curiosity experiences shared by participants were directed towards existential topics such as religion and adversity rather than trivial object or topics. Even after reassuring the participants that all curiosity experiences were valued, regardless how trivial they might believe them to be, this

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trend continued. A review of the literature found children as young as preschool and kindergarten were curious about existential topics (Chouinard, 2007; Engel, 2011). Possible explanations for curiosity directed towards existential topics include: existential topics are more likely to be connected to meaningful experiences, existential topics are associated with strong emotions, and existential topics have no easy answers. Therefore, curiosity experiences associated with existential topics are more likely to be remembered.

While the objects of participants' curiosity varied, there were many commonalities. Specifically, all participants demonstrated interpersonal curiosity, while some demonstrated intrapersonal curiosity and curiosity focused on existential topics. The recent development of measurement scales for assessing interpersonal and intrapersonal curiosity indicates that researchers understand that objects of curiosity are not always objects but also people. This current study provides justification for further research on curiosity related to interpersonal and intrapersonal subjects.

Theme 6: Feelings or States of Being

Each of the transcriptions analyzed for this study contained either direct statements or statements that implied a negative or positive feeling associated with being curious. While the terms *interest* and *interesting* were most commonly referenced by participants, the researcher was able to infer more specific terminology based on participants' descriptions of their experiences. Berlyne (1960) used the term *collative variables* to describe both the negative and positive feelings associated with curiosity. Some examples of collative variables shared by both researchers and participants were intrigue, interest, incongruity, uncertainty, doubt, surprisingness, and puzzlement (Berlyne, 1960; Day, 1982; Litman, 2008). While participants' descriptions demonstrated evidence of both interest-type and deprivation-type curiosity, it was

difficult to ascertain which type of feeling drove their desire to explore. Was Addie's desire to watch one more documentary about the Kennedy family prompted by a need for pleasure or a need to resolve an uncomfortable feeling? Analysis of participants' recollections of their curiosity experiences has the potential to discover the root of curiosity and perhaps provide credence to one or more theories of curiosity.

To summarize phase two, the findings corroborate the seminal work of Berlyne (1960) and the more recent work of Litman (2008). Curiosity was associated with both positive and negative feelings and inner states of being. These feeling or states of being triggered an urge to know more about the object of curiosity. Although researchers agree that objects of curiosity vary among individuals, the current study found that participants shared a mutual interest in understanding people. Further research in this area might demonstrate a difference between students pursuing a field noted for helping people, such as teaching and counseling, compared to students pursuing a field in the sciences, such as technology and engineering.

Phase Three: Exploration

During phase three, curiosity was typically manifested by some form of exploration through independent or social activities. The extent of participants' exploration was often related to the support that was provided by influential individuals and the degree participants were intrinsically motivated to seek new information. Phase three encompassed three themes. They are as follows:

- *Theme 3: Experiences of curiosity are associated with influential individuals who provide exposure to novelty, encourage autonomy, share similar curiosities, and foster a relationship based on trust.*

- *Theme 5: Curiosity is manifested in social interactions and independent physical or mental activities.*

- *Theme 7: Motivations to explore objects of curiosity are intrinsic.*

Phase three was, in this researcher's view, the most significant and critical because curiosity could be prematurely ended during this phase if the conditions neglected to foster and encourage exploration. Individuals could positively or negatively influence motivation to explore objects of curiosity. Influential individuals were mentioned to varying degrees in every participant's account of curiosity. They were credited with encouraging autonomy, sharing similar curiosities, and fostering relationships. This was not surprising given the role family members play in creating conditions for curiosity to flourish in infants and toddlers (Endsley et al., 1979; Samuels, 1980).

Theme 3B: Autonomy

During the exploration phase, participants described influential individuals who encouraged their independence while still providing guidance and support when needed. The influential individuals refrained from giving too much advice but provided enough support to keep participants from feeling overwhelmed and anxious. Research on the role of autonomy as a condition for curiosity is limited. In 2004, Kashdan and Fincham suggested that autonomy encourages curiosity by minimizing control and allowing individuals the freedom to make personal decisions. Certainly, this makes sense to anyone who has observed parents of young children. Parents are continuously seeking balance between assisting their children and affording them the independence to try things on their own. Once children enter formal schooling, the extent of their autonomy diminishes, as does their curiosity-type behaviors (Engel,

2011). When combined with the data from this study, it appears that autonomy and curiosity share a symbiotic relationship.

Theme 3C: Shared Curiosities

Although participants were encouraged to be autonomous by parents, teachers and friends, they frequently enlisted others to join them in their search for information. These individuals shared similar curiosities and questions. Sometimes they were recruited at the onset of the curiosity experience but most often they were called in for support when finding information became a challenge. A study by Levitt et al. (2009) corroborated this theme. As a result of interviewing individuals who self-reported being highly curious, they found that the experience of curiosity brought individuals closer to others who shared similar interests. The social and collaborative nature of exploration is an important area for future studies.

Theme 3D: Relationships

The relationship between influential individuals who sparked curiosity and participants of this study was characterized with such terms as positive, close, caring, and founded on mutual respect and trust. Participants described these individuals as nonjudgmental, open, and relatable. The fact that relationships played a substantial role in fostering curiosity was not surprising. Research directed towards parents and their young children corroborated these findings. Young children who have a strong attachment to a parent were more likely to be comfortable exploring their environment (Ainsworth& Bell, 1970). As proposed by Kashdan and Fincham (2004), strong and close relationships provide fertile ground for cultivating curiosity.

The relationship between theme three and curiosity has been corroborated by research on young children and proposed by Kashdan and Fincham (2004). It appears that curiosity continues to thrive when and if conditions are created that encourage and make it safe for

individuals to explore. The support and encouragement provided by people continues to be a condition that fosters curiosity in others from infancy through young adulthood and their relationships with others, grounded in trust and respect, nurture and encourage exploration.

Theme 5: Manifestation

Participants manifested their curiosity through external activities such as asking questions of others and joining discussions. However, they often manifested their curiosity in ways that were not so easy to ascertain such as thinking, observing, reading, and viewing. While research is scant, the different forms of manifestation have been corroborated (Arnone et al., 2011; Day, 1982; Loewenstein, 1994). What is important to take away from the findings is curiosity, and even some means for manifesting curiosity, cannot be observed. This finding holds relevance to research conducted by Engel (2011). Prior to reviewing her research, the researcher of this study had concerns, based on personal observations, that curiosity was not being cultivated during children's time in school. Engel's research confirmed the researcher's informal observations. Engel observed as few as 2-5 curiosity episodes during a two-hour stretch of time in kindergarten classrooms. Yet, no other recent research could be found to corroborate or contradict Engel's findings. Therefore, the researcher entered this study with an assumption that curiosity may not be sparked in the context of school. While the current findings did little to contradict this assumption, some participants' curiosity was directed towards topics that they were exposed to during school.

There are several important insights that can be gleamed from the analysis of participants' descriptions in light of this research. First, it is important to note that curiosity-type behaviors, or manifestations of curiosity (phase three) are not equivalent to true curiosity (phase two). Consequently, the children observed by Engel may have been curious about a topic

presented by their teacher but the conditions that encourage exploration may not have been in place. For instance, Joy described how her teacher's lack of empathy discouraged her from asking her teacher questions. Additionally, the manifestation of curiosity is not always visible to others. Curiosity can be manifested through independent activities such as thinking and observing. For example, Quinn shared that her mom and dad's differences sparked her curiosity, but rather than ask them questions, she simply observed their behavior. Lastly, curiosity sparked by information shared in the context of school may be manifested in contexts out of school. For example, Blake shared how his curiosity was sparked by exposure in school to theories of evolution. Yet his curiosity-type behavior manifested at home in a conversation with his father rather than at school. As noted by Engel (2011), children are curious and they have questions. However, the school setting provides little opportunity for them to act on their curiosity. Therefore, examining and understanding curiosity experiences to the fullest extent requires more than observation.

Equally important is understanding that successful exploration depends on access to resources. In most instances of curiosity, participants were not limited by a lack of resources. They utilized people, books, documentaries, and the Internet as tools for exploring their objects of curiosity. However, when resources fell short, curiosity often waned and participants experienced frustration or anxiety. The manifestation of curiosity that is prominent in phase three requires the support of people and resources to be successful.

Theme 7: Motivation

Curiosity has been frequently associated with intrinsic motivation (Gruber et al., 2014; Loewenstein, 1994). Findings from the current study suggest that curiosity sparked exploration that was intrinsically motivated by a desire to reduce or induce the feeling associated with

curiosity. Specifically, exploration was motivated by a desire to find meaning or make sense of a phenomenon, increase feelings of competence, or simply experience pleasure. The extent that participants were motivated to explore objects of their curiosity was dependent on their level of interest and the relevance and usefulness of the information they sought to obtain. These findings are aligned with a mastery goal orientation and have been found to share a relationship with curiosity (Hulme et al., 2013). Current participants' descriptions of their curiosity experiences did not include a single reference to extrinsic rewards. This is not to claim that every participant had a mastery orientation towards learning, but simply when curiosity was ignited, mastery orientation prevailed. The link between curiosity and intrinsic motivation has also been corroborated by neurological studies. The induction of curiosity aroused the same portions of the brain responsible for inducing positive feelings associated with anticipation and reward (Gruber et al., 2014; Kang et al., 2009). Future neurological research has the potential to increase our understanding of why curiosity tends to be a rewarding and pleasurable experience despite the fact that it can arouse uncomfortable feelings and inner states of being.

To summarize phase three, the manifestation of curiosity has received less attention than the triggers that spark curiosity and the feelings or states of being associated with the urge to know more. Based on the findings from prior research and the current study, individuals are innately curious. Certainly, there is no denying that young children are curious about their world. What appears to delineate preschool children from school-age children is the extent in which they explore their surroundings. Theories of motivation such as self-determination (autonomy, competence and relatedness), goal orientation, and self-efficacy have been proposed by researchers to be associated with curiosity (Gulten, et al., 2011; Hulme, et al., 2013; Kashan

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& Fincham, 2004; Pajares, 1996). Participants' descriptions of their curiosity experiences provided evidence of the connection between these theories and phase three of curiosity.

Phase Four: Resolution

Phase four has not been given much attention by researchers and data from this current study identified only one theme that was prominent. During phase four, participants' experienced similar negative and positive feelings as identified in phase two. However, feelings associated with phase four were directed towards the resolution of curiosity rather than the initiation of curiosity.

- *Theme 6: Curiosity prompts internal states (incongruity, intrigue, dissonance) and feelings (excitement, frustration, anxiety) that are both positive and negative.*

The current finding regarding the resolution phase of curiosity indicated that curiosity that was resolved induced positive feelings such as satisfaction, pride, and relief, whereas curiosity that was not resolved induced feelings of frustration. However, some participants learned to accept that answers were unlikely to be obtained, at least in the very near future. In these cases, curiosity was resolved or accepted and participants appeared to have a grounded understanding of their ability and capacity to obtain sought-after information. This is in keeping with theories of self-efficacy that contend individuals pursue activities which they feel will result in success but also understand the reality of their current skills (Pajares, 1996).

In summary, the findings from this study corroborate and expand on prior empirical and conceptual research. Historically, researchers have leaned towards understanding the cause of curiosity (phase two). The data from this study corroborated theories that attribute curiosity to both reductive and inductive explanations (Litman, 2005). However, most importantly, the data augmented prior findings by proposing an expanded definition for understanding curiosity as an

experience. While phase one and two have been the focus for researchers interested in understanding the cause of curiosity, phase three has received greater attention from researchers interested in the development of young children. Phase four, on the other hand, has been neglected in the research.

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

The collective findings from this current study and prior studies present an opportunity to discuss and propose implications for three groups of individuals: researchers, K-12 educators, and individuals responsible for preparing future teachers (teacher preparation programs). Specifically, the focus for researchers will center on findings that could potentially deepen understanding of the conceptualization of curiosity. The focus for K-12 educators will consider how the findings can inform their practice and instructional decisions. For individuals responsible for preparing prospective teachers, the implications will focus on what participants' descriptions revealed about their prior curiosity experiences and ways to capitalize on those experiences to help ensure that they will be prepared to foster curiosity in their future students.

Researchers

The following discussion will include an analysis of the research resulting from the findings from this current study and prior studies as they relate to the conceptualization of curiosity. This is vital for researchers because findings from prior research and this current study indicated that the multi-dimensionality and complexity of curiosity has presented challenges in conducting empirical studies and interpreting results. Findings from this current study may assist in clarifying the construct of curiosity by introducing a four phase model, discerning curiosity from other related constructs, and providing evidence of the different types of curiosity.

<u>Four Phase Model</u>

As the findings of this current study were being analyzed and reported, questions and insights surfaced from the process related to understanding the conceptualization of curiosity. The following questions will be addressed in this section:

- *What evidence exist from the data for a four phase model of curiosity?*

- *How will defining curiosity as an experience that includes four phases benefit future research?*

The rich descriptions shared by participants provided a window into how curiosity is experienced and under what conditions, resulting in a broader view of curiosity as an experience rather than simply a feeling or state of being.   An analysis of the descriptions resulted in a four phase model of curiosity. The phases included: precursory, true curiosity, exploration, and resolution. Participants' descriptions of phase one (precursory) included events such as going on a vacation, attending church services, and tutoring students identified on the autistic spectrum disorder. Descriptions of the second phase (true curiosity) included attention that was drawn towards an object of curiosity such as heritage, people, evolution, religious differences, and brain functioning. Descriptions based on the third phase (exploration) included observing interactions between people, asking questions about religion, watching documentaries, and following a link about celebrities. Finally, descriptions of phase four (resolution) included feelings such as pride when sought-after information was gained and frustration when sought-after knowledge was not obtained.

Researchers may find it useful to examine curiosity experiences using the four phases of curiosity extrapolated from participants' descriptions. This will allow researchers to study each phase as a separate unit or all four phases as a system. In particular, research directed towards

understanding phase one may assist practitioners in creating conditions that are likely to spark curiosity in their students. While neurological studies have assisted in understanding phase two, drawing information from first person accounts of curiosity might increase confidence in the findings. Further research directed towards phase three might provide support for practitioners in cultivating conditions that encourage their students to act on their curiosity. Lastly, attention directed towards phase four might provide practitioners with ways to build on their students' successes and ease their frustrations when their efforts are not rewarded with answers.

In summary, conceptualizing the curiosity experience as a process that includes four phases can potentially inform the design structure of future studies by clarifying the focus. Studies can be designed and conducted that further understanding of how the four phases interact as a system or deepen understanding of a condition specific to one of the phases. By clarifying the focus, researchers may find it easier to use the findings from various studies of curiosity to make comparisons and build on prior research.

Proposed Theories of Curiosity

The focus of this current study was to understand participants' curiosity experiences and share those experiences. However, in seeking to understand their experiences it became apparent that curiosity was not well understood by participants, as well as researchers. Consequently, there is a need to add to the body of research that aims to conceptualize curiosity in order to improve future studies on curiosity. The following discussion aims to support and adjunct prior findings by integrating data from the current study. The questions that will be addressed during this section are as follows:

- How does the data from the current study provide support or credence to a particular theory of curiosity?

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- What role do other related constructs play in inducing curiosity*?*

In order to facilitate a discussion of the questions above, this section will begin with a review of neurological studies and the connection between curiosity and the anticipation of extrinsic rewards. Following the review, a connection will be proposed between anticipation and two types of curiosity: interest and deprivation. Participants' descriptions will be shared as evidence of both types of curiosity and analyzed again to assist in clarifying differences between curiosity and interest.

Curiosity and Anticipation

The combination of findings from recent neurological studies and the current study provided some evidence that curiosity and anticipation share significant similarities. Using magnetic resonance imaging, researchers discovered that the induction of curiosity triggered activity in the portion of the brain associated with an anticipatory response (Gruber et al., 2014). Gruber has proposed that curiosity gets the brain ready for new learning (Gruber, 2016). Gruber (et al., 2014) also discovered that the brain responded in a similar manner when individuals anticipated the forthcoming of an extrinsic reward. Anticipation has been defined as looking forward to something pleasurable or looking forward to relieving something unpleasant (Mirriam-Webster, 2016). For example, individuals might anticipate with excitement the arrival of out-of-town guests but after several weeks, they may likely anticipate the departure of those same guests. Although both experiences result in a reward, the arrival of guests would likely trigger a feeling of pleasure and the departure of guests would likely trigger a feeling of relief. The connection between curiosity, anticipation, and rewards is meaningful because it provides a bridge for understanding theories of curiosity.

Support for Theories of Curiosity

Understanding anticipation is important for understanding theories of curiosity. In order to anticipate, individuals must perceive that something is missing and know that the missing information will be obtained in the future. This provides credence to Loewenstein's information-gap theory of curiosity. Loewenstein (1994) proposed that curiosity is triggered when an information gap exists between what individuals know and what they realize they do not know and that curiosity is propelled by exposure to new information. However, as shared above, anticipation can involve looking forward to the induction of a reward or looking forward to the reduction of something unpleasant. Loewenstein argued that there is only one type of curiosity and that it is results from a feeling of deprivation.

On the other hand, Litman (2008) proposed two types of curiosity: deprivation (D-type EC) and interest (I-type EC). D-type curiosity is associated with a reductive process, described as the anticipation of relieving an uncomfortable feeling. I-type curiosity is associated with an inductive process, described as the anticipation of inducing a pleasurable feeling. Participants' descriptions of their curiosity experiences provided evidence of both I-type curiosity and D-type curiosity.

Participants' Descriptions

Creating uncertainty, incongruity, and doubt can spark deprivation-type curiosity. Following, are some examples of D-type curiosity extracted from participants' descriptions. Blake's exposure to the idea of evolution generated feelings of incongruence between evolution and ideas of his faith. He sought the advice of his father in order to make sense of the new information and relieve feelings of incongruence.   Aubrey's curiosity about her future aspirations generated feelings of uncertainty in which she sought information and certainty.

Lastly, Joy's curiosity about her father's decision to not have contact with her was associated with feeling perplexed so she sought information to make sense of his actions. For these participants, the resolution of D-type curiosity was associated with a feeling of relief. This makes sense because D-type curiosity is associated with an uncomfortable feeling. Furthermore, participants who described D-type curiosity experiences were typically passive recipients of novel information. They were exposed to the novel information or perspective as a result of circumstances. This is not to say that D-type curiosity is never sought. Reading a good mystery is an example of D-type curiosity because the reader is drawn into the story by the author's ability to generate feelings of anticipation and uncertainty. Despite feeling uncomfortable, individuals who enjoy reading mysteries read more than one book.

Some of the participants' descriptions aligned more closely with I-type curiosity than D-type curiosity. For example, Chloe's curiosity about her teachers led her to stay after school to get to know them. Chloe's curiosity did not appear to stem from an uncomfortable feeling but rather a feeling of interest and excitement. Similarly, Quinn's curiosity about people drew her into contexts (shopping malls) that were conducive to people watching. Sometimes, her desire was so strong that she would stop to watch strangers on the street or in their homes as she passed by their windows. Finally, Riley's curiosity for discovering facts was satisfied by watching a variety of documentaries. For these participants, the resolution of I-type curiosity was associated with a feeling of pleasure or enjoyment. Additionally, participants who described I-type curiosity experiences often sought novel information or perspectives. This makes sense because I-type curiosity experiences are associated with a feeling of interest or excitement in which participants anticipate, or look forward to, a pleasurable outcome.

It is rare that all examples of a phenomenon clearly fall under one of two categories. It is the exceptions that continue to drive researchers' curiosity to know more. Addie's curiosity experience related to the Kennedy family was one such exception worthy of analysis. Her obsession with the Kennedy family was so intense that her curiosity bordered I-type curiosity and D-type curiosity. Addie undoubtedly had an interest in information about the Kennedy family and found the process of learning about them pleasurable and enjoyable (I-type EC). However, she also appeared to have an insatiable desire to fill in informational gaps in her knowledge (D-type EC). Perhaps, at some point curiosity, driven by interest, borders curiosity driven by an uncomfortable feeling and that the two different types of curiosity proposed by Litman (2008) represent a continuum rather than a dichotomy. While understanding the differences between I-type and D-type curiosity is informative, it is important to note that both types of curiosity share the common goal of an appetite or desire for knowledge (Litman, 2016).

Curiosity and Interest

The relationship between curiosity and interest has led to a debate about which comes first. Does curiosity spark interest or does interest spark curiosity? Participants' descriptions provide evidence of both.

Several participants described experiences in which the object of their curiosity was related to their interests. For example, Riley had an interest in learning factual information. She sought novel information by watching documentaries on topics such as war, food, and tornadoes. Quinn, on the other hand, had an interest in people. The sight of people interacting was enough to cause her to stop what she was doing to observe their behaviors. Isaac's curiosity about filmmakers and YouTube stars was intact when he clicked on a link about the Fine Brothers. Finally, Chloe's curiosity about a teacher resulted from her interest in people.

What appears to be a pattern extracted from these examples is that the object of participants' curiosity was related to their broader interests. This makes sense because content related to interests provides a source of novelty that can potentially spark curiosity. Novelty unrelated to prior interests is less likely to spark curiosity unless the features are highly out of the ordinary. In other words, an individual who lacks interest in birds may not be curious about a bird unless the bird has an out of the ordinary feature such as two heads. However, keeping in mind the bird example, it cannot be assumed that interest is a precursor to curiosity.

Participants also shared curiosity experiences in which the object of their curiosity appeared to be unrelated to their prior interest. Prior to Remi's light on her dashboard turning on, she appeared to have no interest in the mechanics of cars. It wasn't until Joy went to church with her father for the first time that she was curious about religion. Quinn admitted to having little interest in English until her teacher shared a piece of literature in a manner Quinn described as "deceptive." Finally, Joy had no prior interest in learning sign language until observing her mother signing prompted her curiosity. This is good news for educators because it demonstrates that they can potentially arouse interest in a topic by inducing curiosity. But does curiosity lead to temporary interest, lasting only until the missing information is filled, or more long lasting interest?

While prior interest about a topic is not a prerequisite for curiosity, interest in a topic can result from curiosity. Remi began to look up more information on her car even after her curiosity about her light was resolved. Although, there is evidence that interest wanes, it is important to note that curiosity can arouse enough interest to keep students engaged in learning.

Although the data from this study appears to corroborate the research that has identified two types of curiosity, there remains the question of whether or not I-type curiosity best

describes curiosity or interest. Perhaps, as suggested by Loewenstien (1994), D-type curiosity is the only real type of curiosity. This was the topic of discussion during a recent "bigthink" video presentation featuring Hidi (2016). Hidi agreed with Loewenstein that D-type curiosity best describes curiosity and I-type curiosity best describes interest. Although she believes that gaps in knowledge can occur when exploring topics of interest, she suggested that it is interest, rather than curiosity, that drives the exploration. A final analysis of Addie's description of her curiosity related to the Kennedy family may clarify the differences.

Addie's first recollection of exposure to the Kennedy family occurred when she was in 5th grade. What maintained her interest for such a long time? Hidi (2016) would argue that interest, not curiosity, maintained her exploration. However, Addie clearly identified a gap in her knowledge related to the Kennedy family and anticipated filling it. She stated, "I feel like I don't ever know enough." Therefore, from her perspective, she had not reached saturation of information. What happens when and if one day her perspective changes and she feels there is nothing more she can uncover about the Kennedy family? This researcher proposes that Addie's interest in the Kennedy family was maintained as long as her curiosity in the topic was sparked. In other words, Addie's interest was continuously propelled by curiosity or an anticipation of novel information related to the Kennedy family.

In closing this section, readers may wonder, what does it matter? What value does clarification of the construct of curiosity have for researchers and how might the information assist and inform future studies? While the purpose of this study was to examine the lived curiosity experiences of prospective teachers, the researcher found the lack of clarity regarding the definition of curiosity a challenge to collecting and analyzing data. If prior to conducting this study, curiosity had been more narrowly defined as "an uncomfortable feeling that can

potentially be resolved once sought-after information is obtained" rather than simply "an urge to know more," then the content of participants' responses might have changed significantly. Additionally, clarification of the construct would aid in interpreting the results of research. For example, Gruber et al. (2014) found that the induction of curiosity improved memory. They posed trivia questions to participants and observed brain activity in response to the questions participants were most curious to know the answers. One of their findings indicated that the induction of curiosity improved memory of incidental information. Assuming this is an example of inducing D-type curiosity, the results would be transferable to the arousal of D-type curiosity but not necessarily I-type curiosity.

To summarize, the discussion above demonstrated how rich descriptions of curiosity experiences can inform and provide evidence of theories that attempt to conceptualize curiosity. Participants' descriptions provided the researcher with data that confirms and questions prior research findings. The findings from first-person accounts of curiosity, along with findings from neurological studies and curiosity measurement scales, have the potential to increase confidence in the results.

K-12 Educators

The participants' descriptions of their curiosity experiences both in and out of school provide K-12 educators with a wealth of knowledge regarding their role in fostering curiosity. In fact, it is this researcher's belief that the most significant finding from this study lies in the potentiality of educators to spark and cultivate a desire to foster curiosity among all students regardless of their future aspirations. The opportunity to positively impact students' desire to learn exists in each and every phase of the curiosity experience. Therefore, the following

discussion is organized by phases of curiosity and includes potential instructional practices to support the recommendations.

<u>Phase One: Precursory</u>

Educators can ensure that their students are being exposed to novel information or novel perspectives that are relevant, meaningful, or useful and build on their students' interests. When the novel information is aligned with students' interests, sparking curiosity is not difficult. In fact, several participants described experiences in which they intentionally sought novel information related to the object of their interest. Educators can identify students' interests by asking them to complete a student interest survey at the beginning of the school year and again throughout the year as their interests grow and change. Interest surveys can also be extended to families of the students in order to gain a broader understanding of the family system and the types of activities they choose to participate in together. Furthermore, educators can identify students' interests by providing students with a log to record the books and articles they choose to read. Educators can then use the information to stock classroom libraries and provide time for students to self-select books during independent reading.

While building on students' prior interests is not always feasible, prior interest in a topic is not necessarily a prerequisite for triggering curiosity. Participants' descriptions included several accounts in which their curiosity was sparked by novel information outside of their prior interests. For example, Riley's English teacher sparked her curiosity by sharing a piece of literature in a manner in which Riley described as deceptive. Educators can create this type of intrigue by presenting novel information in ways that generate surprise, puzzlement, incongruity, uncertainty and controversy. In addition, educators can create anticipation for information by withholding some information and thereby creating a gap in knowledge (Loewenstein, 1994).

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For example, educators can choose to read a riveting excerpt from a book but stop before revealing anticipated information or close a lesson with a statement that foreshadows what is to come the following day.

As well as building on students' interest and deliberately inducing interest, educators may find value in knowing that their passion for a topic can potentially induce curiosity in their students. Participants' descriptions included three examples in which their curiosity was sparked by someone else's passion.

In addition to exposing students to novel information or novel perspectives, providing students with some autonomy can also set the stage for curiosity to develop because autonomy provides opportunities for students to find objects that spark their curiosity (Kashdan & Fincham, 2004). Participants' descriptions, along with studies of toddlers and school-age children produced similar findings. For example, Riley was able to independently create and implement lessons with children labeled as autism spectrum disorder that sparked her curiosity to know more about the students' disability. Teachers can infuse autonomy into some of the activities they plan for their students. For instance, rather than prescribing specific books and websites, teachers can give students some choice regarding what they want to read and explore. For teachers who are uncomfortable with providing too much autonomy, choice can be limited to topics that fall under the larger umbrella of the content. For example, a study on WWII might include opportunities for students to choose to research a perspective that aligns with their curiosity. For example, a student might want to know more about what it was like to be a female working in the army. After researching, students can share the responsibility of teaching their classmates about what they learned.

Whether directly exposing students to novel information or indirectly providing students with the autonomy to obtain novel information on their own, teachers play a pivotal role in creating the conditions that are likely to spark curiosity. Teachers' unique position allows them to design environments that set the stage for curiosity to flourish. Teachers can take advantage of their unique position by getting to know their students' interests and allowing them the autonomy to find new interests.

Phase Two: True Curiosity

Once students' curiosity is ignited, educators need to allow students to feel uncomfortable and to struggle or grapple with the novel information (theme six: feelings/states). They can do this by refraining from giving answers too soon. Providing time for students to ponder and Tabout the content presented increases anticipation and sets the stage for learning (Gruber et al., 2014). Participants' recollections of their experiences provide evidence that the most memorable experiences are those in which curiosity was aroused but information was not quickly gained. In situations in which information was provided immediately after curiosity was sparked, the information was forgotten. As stated by Isaac, "I may have been curious but I don't remember because the teachers usually gave us the information right away." It is important to note that the implication suggested is not intended to convey that teachers should always wait for a prolonged time before supplying students with needed information; rather, it is recommended that teachers make an intentional decision regarding how much time should elapse. When participants' object of curiosity was directed towards existential topics, their curiosity tended to linger. However, curiosity about trivial information was quickly resolved by simply searching Google. Teachers can deliberately choose how much time to give students to grapple with information based on the extent they want the information to be remembered. Thought

provoking content may be deemed more worthy of time compared to content that involves the knowledge of facts.

<u>Phase Three: Exploration</u>

Phase three encompassed three themes, one that contained several secondary themes. The themes included theme three (influential individuals), theme five (context), and theme four (manifestation). The findings demonstrated the potentiality of the role of the teacher and school context in creating conditions that foster curiosity. The following discussion will explore actions teachers can take to foster positive relationships, provide autonomy, create collaborative support structures, increase opportunities for exploration, and take advantage of curiosity as an intrinsic motivator for learning.

Relationships

First, educators can positively impact students' desire to explore their curiosities by establishing relationships with their students that encourage them to take risks without fear of feeling embarrassed, judged, or ridiculed (theme three: influential individuals). They can do this by exhibiting a nonjudgmental attitude, being open, demonstrating concern for students' well-being, and sharing enough personal information to be viewed as approachable to students. While methods for establishing positive relationships with students cannot be prescribed, some suggestions for creating conditions that foster relationships of trust and mutual respect are described below. The suggestions are based on the accounts from participants' curiosity descriptions.

Teachers are challenged with the task of being perceived as professional at the same time as being perceived as open and relatable. According to participants, influential individuals knew how to find this balance and they did this by sharing an appropriate amount of personal

information. One method teachers can use for sharing personal information is creating a book or essay about themselves that can be used as a model for students to create and share their own stories. The book or essay can be shared at the beginning of the school year as part of a get-to-know-you activity. Furthermore, throughout the school year, teachers can read and respond to students' personal journals. Their responses can include information related to their students' lives. For instance, if students share a particular movie they like to watch, the teacher can respond by sharing one of his or her favorite movies. Additionally, teachers can continue to share personal information in more subtle ways by displaying pictures of themselves or family members, including their own birthday along with students on the calendar, and participating in school-related events outside of the classroom.

In addition to being relatable, participants also described influential individuals as being nonjudgmental and accepting. Participants felt safe in sharing their questions because they believed that the influential individuals would not ridicule or embarrass them as a result. Teachers who want to ensure that their students feel comfortable and safe sharing their questions will need to monitor their actions and words so that students do not feel negatively judged. Teachers can do this by reflecting and confronting the biases they bring from their life experiences to the classroom. One method for doing this is to periodically videotape teacher-student interactions. Viewing the video allows teachers to assess their interactions. How did the content of the interactions with various students differ? Who received more time and attention? Who was neglected? These questions may help teachers monitor any unintentional biases and create an environment in which students feel safe to explore.

As well as character traits of individuals who positively influenced participants' curiosity experiences, participants described their relationship with the individual as close, warm, and

often loving. The participants believed the influential individual cared not only about their academic achievement but also their emotional well-being. One way teachers can convey to their students that they care about them is to celebrate their students' academic improvements and their nonacademic achievements. Given the impact of high stakes testing and accountability, attention to students' academic achievements has monopolized much of teachers' time. However, teachers can convey that they care about the whole child by celebrating academic and nonacademic accomplishments. Celebrations can be as simple as a verbal announcement or written announcement hung on a bulletin board. Additionally, teachers can convey to students that they care by setting aside time to listen. While one-on-one time is a greater challenge in secondary schools, conversations can occur after school, at lunch, or through written communication.

In summary, teachers have the potential to create conditions that foster curiosity by establishing positive relationships with their students. Simple acts such as sharing some personal information, monitoring interactions with students, and celebrating the whole child, can result in conditions that make it safer for students to ask questions and explore their curiosities.

Autonomy

Second, educators can provide students with some choice and autonomy over their learning while providing guidance and support when needed (theme three: influential individuals). Educators can closely monitor students' progress towards finding sought-after information. If they notice their students are feeling overwhelmed, anxious, or frustrated, they can provide support by joining them in their pursuit of information or giving them opportunities to work collaboratively with peers, especially peers who share similar curiosities and questions. They can do this by implementing practices that involve inquiry and research and allowing

students who have similar curiosities to work collaboratively. As a result of implementing collaborative inquiry, students can support one another while the teacher is available to support groups who encounter challenges in locating and understanding content related to their curiosity.

Manifestation

Third, educators can provide time for their students to act on their curiosity and provide access to resources that support their explorations (theme four). Although research indicates that children exhibit few curiosity-type behaviors, it cannot be assumed that the absence of curiosity-type behaviors among children is indicative of their curiosity. The findings from this study suggest that students are curious, albeit to varying degrees. Therefore, the absence of curiosity-type behaviors may be more indicative of the lack of opportunity children have to explore their curiosities while in school (Engel, 2011). While there is certainly no denying that educators feel pressure to teach to the standards, follow an imposed curriculum, and prepare students to successfully pass mandated tests, it is imperative that students be given opportunities to engage in exploration if graduating students who are curious is to be a priority. Teachers can provide opportunities for students to manifest their curiosity through both social and independent activities. Teachers can give students opportunities to collaboratively pursue information. For example, a unit on human systems might prompt curiosity about different parts of the human body. Rather than transmitting the knowledge, the teacher can provide time and resources for groups of students to pursue information and share with their classmates afterwards. The teacher can adjunct the content when needed during the collaborative process or during the sharing process at the end of the unit. Additionally, teachers can encourage students to explore their questions through independent activities. This can be accomplished simply by giving students permission to conduct a quick Google search when the need for simple information arises or by

taking advantage of the home-school connection and having students research and share their

learning over a lengthier time period.

Motivation

Fourth, in order to increase students' motivation to explore, educators can encourage

students to set personal goals for learning that are unrelated to extrinsic rewards such as grades,

points, or prizes. They can also emphasize and share positive feelings associated with

exploration and deemphasize competition and extrinsic rewards when possible. Some possible

intrinsic rewards that result from exploration are pride, competence, pleasure, and self-

fulfillment. Teachers can tap into students' intrinsic motivation by encouraging and celebrating

students' efforts and refraining from replacing the reward of knowledge with an extrinsic token.

While extrinsic rewards can potentially engage and motivate students to perform particular

actions, they can interfere with intrinsic motivation when they are used without justification or

need (Deci, Koestner, & Ryan, 1999).

Phase Four: Resolution

Curiosity, or a desire to know more, does not end once answers are obtained (theme

seven: intrinsic motivation). In fact, curiosity tends to breed more curiosity. During all phases

of curiosity, educators can encourage students to record questions that pop into their heads in a

journal and revisit them during phase four. When curiosity is not resolved, educators need to

remember that effort ebbs and flows based on the object of curiosity and that students'

knowledge tends to build over time. Therefore, students may find that revisiting prior

knowledge or questions after some time has passed prompts a new perspective of old

information. Personalized writing journals that give students the flexibility to write and learn

about topics prompted by their questions are great tools for visiting and revisiting objects of curiosity.

Finally, in order to increase feelings of pride and competence, educators can provide time for students to share what they have learned independently or in collaboration with their peers. By doing so, students gain a stronger sense of confidence and self-efficacy while at the same time potentially exposing their peers to novel information. The teacher can facilitate feelings of pride and competence by allocating time at the end of each day or week for students to share what they have learned or by posting announcements on a class bulletin board. Both curiosity that is resolved and curiosity that goes unresolved can be honored by focusing on students' efforts rather than solely the results of their exploration.

In summary, the findings from this study provide K-12 educators with some specific suggestions for creating conditions that cultivate curiosity. The suggestions align with the themes extracted from participants' descriptions of their curiosity experiences. They emphasize designing practices that spark curiosity and creating conditions that foster exploration of curiosity. The inclusion of these conditions and practices may not only increase academic achievement for students but also provide benefits beyond high school graduation.

Teacher Preparation Programs

Based on the researcher's knowledge, there have been no prior studies conducted to examine the lived curiosity experiences of prospective teachers. Furthermore, while several researchers have found a connection between lived experiences and future teaching beliefs and practices, the studies did not include curiosity-type practices and beliefs. Therefore, the implications for teacher preparation programs shared in this section are intended to be suggestions. The suggestions integrate findings from the current study and prior studies on the

influence of teachers' apprenticeships of observations. The following discussion will focus on what was learned about prospective teachers' lived experiences, the implications for their future teaching beliefs and practices, and what teacher preparation programs can do to help ensure prospective teachers will be prepared to foster curiosity in their future students.

<u>Prospective Teachers</u>

The participants who volunteered for this study provided a window into their lived curiosity experiences. Their descriptions offered insight into the beliefs and practices that will likely influence their future teaching beliefs and practices. These descriptions included both in-school and out-of-school experiences. Therefore, teacher preparation programs might find it valuable to consider both contexts in their plans to prepare prospective teachers.

The research findings shared in Chapter Four indicate that participants recalled few school-related curiosity experiences triggered by academic content. Although their curiosity may have been piqued during their time in school, many of those experiences were ignited by social rather than academic-related content. This is not to say that participants had not been exposed to novel information or novel perspectives during their time in school. Participants remembered curiosity experiences related to weighty topics such as the Holocaust, 9-11, and the psychology of the human brain. However, it was difficult to discern if curiosity about these topics was sparked by events that occurred in or out of school. It appeared that academic content that was valued and explored in both environments was more apt to hold more meaning and be remembered by participants.

While not always sparking curiosity about their content, teachers were often credited with being influential individuals that assisted the participants in exploring nonacademic curiosities. Teachers were often characterized as being caring, open, nonjudgmental, knowledgeable,

passionate and relatable. They were credited for creating conditions that made it safe for prospective teachers to ask questions and seek support. On the flipside, a few teachers were remembered for creating conditions that discouraged curiosity-type behaviors. One participant recalled a teacher who made her feel "stupid" for asking questions and another participant recalled a teacher who neglected to show compassion when it was most needed. Research has suggested that negative experiences have the potential to have positive outcomes on future teaching beliefs and practices. Participants' recollections of teachers they do not want to emulate can propel them to adopt opposing beliefs and practices (Sexton, 2004). If the experiences shared by participants in this study are indicative of their future beliefs and practices, establishing relationship with students will be a priority.

While people were often credited with creating conditions that fostered curiosity, people, including teachers, were often the object of participants' curiosity. In fact, every participant shared at least one curiosity experience that centered on gaining information about an individual or a group of individuals. Given that all of the participants planned to enter a field that revolves around helping people, this finding was not surprising. However, it may have a profound influence on participants' future teaching practices, and therefore, it should be noted by teacher preparation programs.

Lastly, the influence of out of school contexts cannot be ignored. While prior research has focused on apprenticeships of observations related to academic teachers, there is some research that indicates "teachers" outside of school contexts can play an influential role on prospective teachers' future beliefs and practices (Smith, 2005). The majority of participants credited parents, grandparents, and adults in the community with positively influencing their curiosity experiences. These influential individuals provided autonomy, exposed them to novel

information or a novel perspective, and joined them in exploring their curiosities, while creating conditions that made it safe to take risks. If it is true that experiences out of school have the potential to impact teaching beliefs and practices, the groundwork has been laid for prospective teachers to employ practices that foster curiosity for their future students. It will be up to teacher preparation programs to assist prospective teachers in recalling, valuing, and implementing what they have learned from their in and out of school apprenticeships of observations.

In summary, based on just a small number of traditionally-aged freshmen, the teaching beliefs and practices associated with curiosity that prospective teachers bring to teacher preparation programs occurred in both in-school and out-of-school contexts. While people were more likely to be the center of their curiosity, academic content was not excluded. Regardless of the object of their curiosity, participants highly valued the positive relationships they had with both in-school and out-of-school teachers. Perhaps, this may explain why people were often the object of their curiosity. It would be interesting to find out if this trend continues when their role shifts from student to teacher.

Role of Teacher Preparation Programs

When cultivating the conditions that spark curiosity becomes a priority in K-12 schooling, prospective teachers will enter teacher preparation programs with a wealth of experiences from their apprenticeships of observations that they can draw upon as they build a repertoire of curiosity-inducing teaching practices. However, when this happens, it cannot be assumed that prospective teachers are prepared to foster curiosity in their future students. Individuals responsible for preparing future teachers have all of the same responsibilities as K-12 educators plus the added responsibility of preparing prospective teachers to foster curiosity in their future students. These individuals may want to consider the following: (1) immersing

prospective teachers in practices that foster their curiosity, (2) explicitly teaching prospective teachers the pedagogy and practices that align with conditions that foster curiosity and supporting them in the implementation of those beliefs and practices, and (3) providing numerous opportunities for prospective teachers to reflect upon and analyze their lived curiosity experiences and how those experiences might influence their future teaching beliefs and practices.

Foremost, teacher preparation programs need to immerse prospective teachers in practices that foster their own curiosities, so that upon graduation, they will be lifelong learners. They can do this by following the same recommendations for K-12 educators. These include but are not limited to presenting novel information or novel perspectives that spark curiosity, cultivating relationships that make it safe for prospective teachers to ask questions and explore, providing assignments that encourage autonomy, allowing time for exploration, and providing support for students when needed.

Additionally, teacher preparation programs cannot assume that prospective teachers will employ practices that foster curiosity in their future students as a result of having been recipients of curiosity-type practices (Cam, 2015; Furlong, 2013; Sampson, et al., 2013). Prospective teachers need to understand the pedagogy that supports curiosity-inducing practices and then be given opportunities to plan and implement those practices. Teacher preparation programs might want to consider an interdisciplinary approach to teaching curiosity-inducing practices that encourages curiosity directed towards a variety of content and topics. While prospective teachers' curiosity about people is an asset to their profession, they may need to be reminded to foster and encourage students' curiosity in all academic fields.

Next, teacher preparation programs may want to provide prospective teachers with opportunities to reflect on their prior experiences and assist them in shifting their perspective from that of a student to that of a teacher (Lorite, 2002; Westrick & Morris, 2016). Prospective teachers need to be encouraged to critique their prior experiences, identify effective practices that foster curiosity, and change patterns of thinking that are not aligned with beliefs and practices that encourage curiosity-type behaviors (Westrick & Morris, 2016). Teacher preparation programs can assist prospective teachers by embracing practices that deliberately build on their prior curiosity experiences and encourage them to grapple with their prior knowledge while integrating new knowledge. One potential practice identified in the review of the literature was engaging students in online blogging (Boyd, et al, 2013; Westrick & Morris, 2016). Providing students with a safe space to debate and critique their prior experiences and new experiences has had some success in encouraging prospective teachers to adopt new practices. Regardless of the specific practice chosen, teacher preparation programs are likely to be most successful when they embrace the conditions uncovered by this study that foster curiosity and exploration.

In summary, individuals responsible for training future teachers are in a pivotal role. They have the potential to spark prospective teachers' curiosities, assist them in learning and implementing practices that foster curiosity, and ensure that they bring to their teaching practice pedagogical beliefs aligned with cultivating conditions that foster curiosity for their future students. They have the potential to positively impact not only their current students but also future generations of children.

The findings from this current study, along with findings from prior studies, have implications for researcher, K-12 educators, and teacher preparation programs. For researchers, the data can be used to further understanding of the construct of curiosity. For K-12 educators,

the findings can be used to create conditions that foster curiosity. Finally, for teacher preparation

programs, the findings can be used to not only create conditions that foster the curiosity of

prospective teachers but also to prepare them to implement practices that foster curiosity in their

future students. The discussion related to the implications included suggestions but by no means

exhausted the possibilities. The research on curiosity might currently be scant but interest in

curiosity appears to be gathering momentum. As it does, it will be important to triangulate

findings from research designs that use both quantitative and qualitative methods, along with

studies that examine the neurology of the brain.

Study Limitations

There are limitations for every study that need to be taken under consideration when

reviewing the findings. The limitations of this study fall under four categories: (a) positionality,

(b) size and homogeneity of sample group (c) protocol design, and (d) complexity of construct

under study.

Researcher Positionality

The first limitation was related to the researcher's position as the interviewer and as an

associate director at the university. Given the semi-structure nature of the interview, the

researcher had to be cognizant at all times of her beliefs related to curiosity in order to ensure

that she was not probing participants for information to confirm her beliefs. This was also true

during data analysis. As shared in Chapter Three, the researcher took several actions to bracket

her beliefs and assumptions throughout the study. During the analysis of the data, she recruited

several colleagues to crosscheck her analysis with their own. While it is not possible to

completely divorce oneself from the research, the researcher's continuous reflection and questioning limited the possible of researcher bias.

The position of the researcher as an associate director had the potential to place pressure on participants to provide answers that they thought the researcher might perceive as valuable. Given the nature of the study as a dissertation, there was no other options but for the researcher to also take on the role of interviewer. However, the participants were reassured that all curiosity experiences were valued and the data indicates that the participants were comfortable sharing both personal and impersonal experiences.

Sample Group

The second limitation, related to the size and homogeneity of the sample group, was a condition of the methodology and study design. The strength of conducting a phenomenological study is that it allows the researcher to examine and understand with some depth the experiences of a particular group of individuals (Creswell, 2013). In order to be effective, the group needs to be fairly homogeneous to ensure that the members have all experienced the construct under study. In this study, the construct was curiosity and the purpose was to gain an understanding of the experiences prospective teachers bring to a teacher preparation program. This limitation was useful but like most qualitative research, the findings cannot be transferred beyond the criteria used to recruit participants.

Additionally, the best method for obtaining rich descriptions of participants' experiences was by conducting live interviews. The interviews needed to be long enough in duration for the interviewee to become comfortable and for the researcher to prompt for elaboration and clarification when needed (Moustakas, 1994). As a result, it was necessary to recruit a large enough sample to draw some conclusions but a small enough sample for the study to be feasible.

The 13 participants fell within the recommendations specified when conducting a

phenomenological study (Creswell, 2013; Moustakas, 1994). Additionally, the sample group

represented individuals from diverse races and ethnicities, different education tracks (early

childhood, elementary, and secondary), along with the inclusion of both males and females.

While the limitations imposed by a phenomenological study does not allow for transferability,

the diversity within the sample group maximizes the potential of the findings.

Protocol Design

In keeping with the assumption of the researcher that curiosity is innate and experienced

by all individuals, the interview protocol was designed with the assumption that all participants

had curiosity experiences and that they would be able to recall one or more of those experiences.

With this assumption in mind, the researcher opened the interview by asking participants to share

a specific curiosity experience. As a result, participants may have felt pressure to construct or

elaborate on a vague or nonexistent experience. The findings presented in Chapter Four are

based on the assumption that participants' descriptions were valid and that any participant who

could not recall a curiosity experience would have notified the researcher.

Complexity of Construct

The third limitation related to the complexity of curiosity could not be avoided. The

multidimensionality of the construct presented challenges for both the researcher and study

participants. Many of the study participants requested clarity regarding what was meant by

curiosity. The descriptions of their curiosity experiences also demonstrated confusion between

curiosity and similar constructs. For the researcher, it was a challenge to determine the extent

that participants' descriptions conveyed curiosity experiences. While some of the participants'

shared specific examples of a curiosity episode, others shared their general propensity or interest

in a particular object, event, or idea. Rather than devaluing participants' descriptions of their

curiosity experiences, the researcher made the decision to analyze each description as a curiosity

experience rather than risking biasing the results.

In order to reduce the impact of this limitation, the researcher made the decision to share

a concise definition of curiosity with participants. The definition, "an urge to know more" was

selected from research conducted by Engel (2011). The simplicity of the definition was

intentionally sought so that participants would not feel limited in their responses. Given that the

intent of a phenomenological study is to gather and understand the lived experiences from the

perspective of the participants rather than the perspective of the researcher (Moustakas, 1994), it

was important to find balance between giving participants some information upfront but not

enough to impose the researcher's beliefs about curiosity onto the participant.

While all research studies are limited in various ways, the limitations imposed by

conducting this phenomenological study were balanced by the richness of the data that could

only be obtained by placing specific criteria on the sample group.   Furthermore, the size of the

sample group fell within the outer suggested limits of a phenomenological study, resulting in

data from a diverse group of prospective teachers while still providing homogeneity. The

participants' descriptions of their curiosity experiences provided a wealth of information that was

vital to this current study and will potentially further future research on the construct of curiosity.

<u>Future Research</u>

Curiosity has not been a focus for researchers for quite some time. However, recently it

appears to have been resurrected by neurological studies (Gruber et al., 2014; Jepma, et al., 2012;

Kang et al., 2009). Research on how the brain functions when curiosity is triggered has

demonstrated the valuable role curiosity plays in enhancing memory and inducing intrinsic motivation for learning (Gruber, et al., 2014). However, more research needs to be conducted in order for conditions that foster curiosity to be made a priority among practitioners and policy makers. The following suggestions for future research are just a beginning, but based on the cumulative findings from prior and current study, are believed by this researcher to be worthy of pursuing.

To understand the construct of curiosity

Future researchers need to continue to gain a clearer conceptual understanding of curiosity and disentangle it from other constructs, specifically interest. As noted above, prospective teachers used curiosity and interest interchangeably. Therefore, examining their experiences under the lens of curiosity was challenging. However, rather than backing away from qualitative research, researchers should consider how analysis of individuals' descriptions of curiosity can provide insights that will assist them in identifying differences between constructs. As a result, the data may help researchers establish and come to agreement on a clearer conceptual model of the construct of curiosity.

To confirm the academic benefits associated with curiosity

While recent neurological studies have identified the positive impact curiosity has on memory and intrinsic motivation, more empirical studies need to be conducted to demonstrate the relationship between being curious and academic learning. The current state of schooling, with its emphasis on high stakes testing and accountability, has produced an environment that is not conducive to fostering curiosity. In order to gain the attention of individuals who impact education policy and encourage policies and practices that foster curiosity, research needs to produce findings that confirm the influence of curiosity on academic learning. Researchers may

want to consider further development of tools that can assess curiosity in young children so that

the results can be compared to their academic achievement. Additionally, researchers may want

to consider developing observation protocols that assess the extent curiosity-inducing practices

are implemented by teachers so that correlations can be made between these practices and

students' academic achievement.

To identify the barriers of cultivating curiosity in schools

Although there is evidence that teachers' lived experiences influence their teaching

beliefs and practices, there are likely other factors that contribute to the lack of curiosity-type

behaviors observed among children in schools. Interestingly, participants' descriptions did not

include references to high stakes testing and accountability policies. While this was not the

focus of the interview, the researcher anticipated that participants might include statements about

testing when asked about their school-related curiosity experiences. The fact that they did not

make references to testing policies prompted the researcher to wonder about the espoused versus

real impact of these policies. To what extent do accountability policies impact educators' ability

to cultivate curiosity and provide time for students to explore? Are some educators finding ways

to create conditions that foster curiosity? If so, how were they able to overcome the challenges?

There is little denying that the pressure felt by educators as a result of NCLB is real

(Abrams, 2004; Santoro, 2011; Vande-Corput, 2012). While high stakes testing and

accountability policies have been ramped up since the enactment of NCLB, testing policies have

been blamed for the exclusion of curiosity-type practices for decades (Susskind, 1979). The fact

that inducing curiosity has not been a priority in education for so long (Dillon, 1988; Susskind,

1979) and that curiosity-type behaviors among children during their time in school have been

infrequently observed in children as young as kindergarten (Engel, 2011), indicates that the

problem is enormously complex. In order to fully understand the barriers and generate solutions, the problem requires attention from many lens. Researchers interested in understanding and identifying the barriers to implementing curiosity-inducing practices may want to consider conducting a gap analysis. A gap analysis has the potential to uncover the causes of the problem from a variety of perspectives and to generate solutions aligned with the causes (Bolman & Deal, 2013).

To understand the impact of lived curiosity experiences

While data from this study provides rich descriptions of prospective teachers' lived curiosity experiences, this study does not provide insights into how their experiences will impact their future teaching beliefs and practices. In order to gain this information, researchers need to collect descriptions of curiosity experiences from prospective teachers immediately prior to their entrance into the teaching profession and follow them during their first year of teaching. The longitudinal data will enable researchers to draw correlations between prospective teachers' lived curiosity experiences and their teaching beliefs and practices in the same manner that researchers have drawn correlations between teachers' lived experiences and other constructs. Researchers may find prior research study designs used for this purpose helpful in guiding their research.

To understand the implications for interpersonal and intrapersonal curiosity

The evidence from participants' examples illuminated two distinct types of curiosity: curiosity directed towards understanding self and curiosity directed towards understanding other people. These rather unique objects of curiosity are generally not what comes to mind when describing curiosity. However, this was a common theme among all study participants and worthy of future studies. This finding provides justification for researchers to continue to not only create and validate scales for measuring interpersonal and intrapersonal curiosities but also

to design studies that generate new understandings regarding the value of being curious about self and people. Some possible questions that might be answered by future research are:

1. How does high interpersonal or intrapersonal curiosity impact individuals' choice of professions?

2. How does high interpersonal or intrapersonal curiosity impact individuals' quality of life?

3. Do individuals with high interpersonal or intrapersonal curiosity make better teachers or counselors?

4. What impact will these types of curiosities have on prospective teachers' future teaching beliefs and practices?

Future studies on interpersonal and intrapersonal curiosities could have the greatest impact on professional fields such as education, counseling, and social work because professionals in these fields are responsible for understanding their clients. Counselors are in an especially unique position because their skills are needed to motivate others to be curious about themselves. The value of self and people curiosity is worthy of future exploration.

To understand how teacher preparation programs are addressing curiosity

An attempt was made during the evolution of this study to gather information about how curiosity is being addressed by teacher preparation programs. Unfortunately, no studies or professional resources were uncovered to address this question. Therefore, no assumptions could be made regarding the extent teacher preparation programs have addressed curiosity. Research in this area is needed because teacher preparation programs are prospective teachers' first exposure to pedagogical beliefs and practices. If fostering curiosity is to be a priority of K-12 education, prospective teachers need to be, at minimum, exposed to curiosity-inducing practices during their enrollment in teacher preparation programs.

There are several potential methods for gathering data related to the extent teacher preparation programs are preparing prospective teacher to foster curiosity in their future students. First, surveys could be sent to students enrolled in teacher preparation programs. In order to obtain a diverse sample, the targeted sample group could include programs from universities situated in different regions of the United States. Second, a sampling of documents including mission statements from a diverse sample of colleges of education, along with course descriptions, could be reviewed to determine the extent curiosity or curiosity-type components are included. Third, sample groups of first year teachers could be interviewed to determine from their perspective the extent that curiosity-type practices and beliefs were infused into their program of study.

In the event that curiosity continues to receive attention from researchers, individuals responsible for preparing prospective teachers will be in a position to put into practice the findings. By gaining an understanding of the current state of curiosity as it is addressed in teacher preparation programs, researchers and practitioners can draw on current practices and new research to create programs that effectively prepare prospective teachers to implement practices that foster curiosity in their future students.

To understand the impact of modeling on curiosity

While several conditions that foster curiosity permeated the data gathered from this study, rarely did participants state that the influential individual modeled their own curiosity. This finding was unexpected, especially given that prior research has demonstrated a strong link between modeling and the acquisition of new behaviors by observers of the model (Bandura, 1963; Engel, 2011). The findings prompted the researcher to wonder why participants did not recall individuals who modeled their own curiosity. Further research needs to be conducted to

determine the impact of modeling on creating conditions that encourage curiosity and exploration. Researchers may want to consider conducting empirical studies that compare the curiosity type behaviors of a control group to a group of students whose teacher intentionally modeled his or her own curiosity.

To understand the extent curiosity is sparked

There are too few studies that have examined the extent curiosity is sparked in various contexts. One of the challenges as evidenced by the research of Engel is too few curiosity-type behaviors are exhibited by students to study. A second challenge is related to the inherent inability to observe true curiosity. Given that the state of being curious is internal, it may be that students are more curious than their behaviors indicate.   While observations of students' behaviors provides some insights regarding the extent children act on their curiosity, researchers may want to go further to uncover information regarding the extent children's curiosities are sparked. Although it is possible to adapt self-reporting measurement scales intended for older populations to assess curiosity in young children, researchers are more likely to gain richer information by interviewing students immediately following their exposure to novel information or novel perspectives. Engel (2011) has pioneered this effort by going into classrooms, observing what is happening, and talking to students. The ability to identify episodes in which children's curiosity is triggered in school may encourage educators to provide time for children to engage in exploration.

To summarize, future research on curiosity is needed in order to increase understanding of the construct of curiosity and support practitioners in creating conditions that foster curiosity for K-12 students and prospective teachers. Recent neurological studies have been conducted that provide evidence of the academic benefits of being curious. However, additional studies

that apply both qualitative and quantitative methods are needed to increase awareness of the benefits of being curious. Further studies in this area will gain the attention of individuals' responsible for ensuring students are exposed to practices that foster curiosity during their time in school. Additionally, researchers may want to consider conducting research that aims to understand the extent curiosity-inducing practices are being addressed in K-12 schooling and teacher preparation programs so that current practices can be enhanced. To increase the value of the research findings suggested above, researchers need to further understanding of the construct of curiosity as a state of being and as an experience.

Conclusion

The purpose of this current study was to examine and understand the lived curiosity experiences of prospective teachers. Understanding the essence of those experiences is a first step towards preparing prospective teachers to implement practices that foster curiosity in their future students. The findings from this study provide individuals responsible for preparing prospective teachers with some insights into their current and future students' lived curiosity experiences. It is hoped that these findings will encourage researchers, K-12 educators, and individuals responsible for preparing future teachers to explore further, through research or practice, the potentiality of fostering curiosity.

APPENDIX A: INTERVIEW PROTOCOL

As part of the doctoral program I'm enrolled in, I'm required to do a study. I'm interested in learning more about curiosity. Specifically, I want to examine the curiosity experiences of freshmen pursing an education degree because I think the information will help us learn more about how we can help prospective teachers like you foster curiosity in your future students. It is important that I share with you that everything you share will be confidential in that I will not share your identity publically but rather use a pseudo name in any written documents I create. I expect to be finished with this current study by August 1, 2016.

Do you have any question so far? I'd like to start by getting to know you a bit. What prompted you to want to become a teacher?

Now, I'm going to begin with some specific questions related to curiosity. The way I'm defining curiosity is simply, the urge to know more. All experiences you share are valuable to this study even if you think some might be trivial.

1. Think about a time you remember being curious. What did you want to know more about?
2. What questions or thoughts stood out for you?
3. What, if any, actions did you take to find out more?
4. What about this experience sparked your curiosity?
5. Describe the environment or context in which this experience took place.
6. What do you remember about the individuals associated with your experience?
7. How would you describe the emotions you felt at that time?
8. What meaning did the experiences have for you?
9. What are your memories of being curious in school?
10. What are your memories of being curious out of school?
11. What role did your family experiences play in fostering curiosity?

Please provide the following information. If you attended more than one type of school, circle all that apply. Thank you for your time and commitment to participate in this study.

First Name:

Birthdate:

Schooling: Public   Private   Charter   Home School   Other

Gender:

Race/Ethnicity:

Intended Education Major:

APPENDIX B: INVARIANT CONSTITUENTS BY THEME

Novelty	Object of Curiosity	Influential Individuals	Manifestation	Contexts	Positive/Negative Feelings/States	Intrinsic Motivation
New perspective with maturity	Differences	Loved learning	Researching Internet	Vacation with family	Frustration when questions go unanswered	Pride
Documentaries	People (looks)	Mutual respect	Seeking opinions of others	Library	Hope	Enjoyment/ Pleasure
Books/Articles	People (thoughts and actions)	Gave choice		At home with friends or family	Discrepancy and incongruence	Certainty
Discussions with others	Teachers	Made me feel special	Joining a discussion	At home using media	Obsession	Personal growth
Different culture/religion	Family members	Open Nonjudgmental	Sharing through email	After school	Longing for more/ not knowing enough	Competence Rewarding
Experiential (nursing home, classroom, hospital)	Strangers Religion	Relatable Fear/intimidation	Reading books, articles, websites	In class Shopping malls	Interest Relief	Sense/Meaning making Help others
Behaviors of others	Word meanings Future – career and college	Share similar curiosities Pushed (out of comfort zone)	Observing others Watching documentaries	Nursing home Hospital	Intrigue Puzzled/ Perplexed	Resolution of conflict Satisfaction
Political news Uniqueness of others	Self Heritage	Let me figure it out	Googled (trivial) Thinking	Church Daycare	Excited	Control Certainty
Going to church Commercial Different lifestyles	Biological parent/family Car mechanics	Gave choice Helped search for knowledge	Asking questions Jumping in/		Stress/anxiety Uncertainty/ doubt	Solution to problem

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	Animals	Knowledgeable	Experimenting		Excitement	
Interactions among people	Religion	Freedom to create and try things	Collaboration with others		Resolve	
New hobby or activity	Conflict	Listened	Disrespect		Unresolved/ Lingering	
Pop-up on computer screen	People as models to emulate	Exposed to novelty	Fear		Anticipation	
Light on dashboard	The Kennedy's	Shared interest	Feared being judged or embarrassed		Eagerness	
Academic content	Wars/Battles	Choice/autonomy	Demeaning		Overwhelmed	
Books/movies	Social injustice	Passionate	Ridicule			
A dream	The brain	Confidential				
Different perspectives		Encouraging				
Unknown word		Accepting				
Characteristics: relevant, useful, meaningful; Related to interest		Encouraged independent thinking				
		Provided just right amount of information				

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APPENDIX C: IRB APPROVAL

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
          FWA00000351, IRB00001138

To: **Susan H. Kelly**

Date: **June 02, 2016**

Dear Researcher:

On 06/02/2016, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Modification Type:	Study title changed from: An Examination of the Lived Curiosity Experiences of Traditional Freshmen Pursuing an Education Major TO An Examination of the Lived Curiosity Experiences of Traditionally-Aged Freshmen Pursuing an Education Degree. A revised protocol and interview questions document have been uploaded in iRIS. A revised consent document has been approved for use.
Project Title:	An Examination of the Lived Curiosity Experiences of Traditionally-Aged Freshmen Pursuing an Education Degree
Investigator:	Susan H Kelly
IRB Number:	SBE-15-11629
Funding Agency:	
Grant Title:	
Research ID:	N/A

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 changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Joanne Muratori

Signature applied by Joanne Muratori on 06/02/2016 12:05:35 PM EDT

IRB Manager

APPENDIX D: BRACKETING INTERVIEW

INTERVIEWER: What is your understanding of curiosity?

SUSAN: Well my understanding now is that it is a gap in knowledge or, Lowenstein calls it, an information gap. So a gap between what you know and what you realize you don't know. And what causes curiosity is that uncomfortable feeling that you have when there's… when you still don't know, and you want to close that gap. The thing about it is that you have to realize that you don't know… in order to have that desire to close the gap, and you have to be interested of course. One of the things I also learned about curiosity is that there's different types of curiosity, which really threw me for a loop because I always thought, well, curiosity is just a desire to know. But there is diversive curiosity, which means, like a desire. It's the child who's always asking questions and wants to know a little bit about a lot. Some people refer to that as breadth curiosity. And then there's the curiosity which is specific curiosity, which is what I'm more familiar with, and when I think of myself, I think of specific curiosity. That's the one where you want to know, you want to understand something with depth. And so it's almost like you… when you're curious, and you're studying it, you're exploring that topic, you lose track of time because you're so into, you know, understanding it. And then the other one that really kind of falls under both, but something I never thought of before, was interpersonal curiosity, which can be – I think – breath or depth, diversive… hmmm… But it's wanting to understand people better.

INTERVIEWER: Let's see

SUSAN: You know there's other factors, like when I think of how do I… What do I understand about curiosity? Oh here's the big one, I think that was an ah-hah for me too. Is that curiosity is really… you can't see it. It's something that, you know, is within. And just because somebody doesn't appear to be curious doesn't mean that they're not curious. They could wonder and have questions but we don't physically see them exploring, and that could be for many reasons. It could be because of the environment… they don't have time, you know, there's all kinds of reasons. That doesn't mean they're not curious.

INTERVIEWER: Interesting. So how has your understanding changed since you've been studying curiosity?

SUSAN: Um, well the big thing, like I said, I thought before it was just, okay, curiosity, a desire to know. It's kids, people asking questions then they're curious. Um, there were things I always wondered about though. The big one which I kind of just mentioned was, um, in high school, when I started teaching high school. But then I would

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have these students who would ask these questions that had nothing to do with the topic

and I'm like, you know what, I think they are curious. So the big thing that I've learned,

and the way my understanding has changed, is that again, you can be curious and not

appear to be curious. And I also, I think also my understanding is that um, adding on the

interpersonal curiosity… I used to not think of myself as curious. Like my husband

appears curious because he's the type of person who will look at a building and go,

"Wow, I wonder how that stands up so high." And I'm always like, "Who cares why it

stands there. It just does." You know. Whereas I might look at the people walking in and

go, "I wonder where they're going. Where did they come from?" So, it's the same kind of

curiosity but it's different content.

INTERVIEWER: So what led you to focus your research on curiosity?

SUSAN: Okay, that one's kind of a long one. Um, interesting… I think when I, before I even, started a doc program, I started working in secondary. I was an elementary person. I started working in secondary and I was the reading coach and I was working with a lot of reading classes and I noticed that, compared to when I taught elementary and the kids asked all kinds of questions… little young children, I noticed that these students weren't asking questions. Um… And so again, they appeared to be not curious and so I asked the students, I asked a ninth-grade group one time I said, "So what? What do you think happens to curiosity?" And they said, because you know when you are young you probably are all very curious. You wanted to know more, you asked lots of questions. They are like, "Miss, it's because we already know everything". Like really? Tell me more about that. And they're like, well you know when you are young, there is everything new to you, but when you get older, not as much is new so you are not so curious. And I started thinking, it's crazy but I started thinking, about other people who I know whose world hasn't expanded and how they appeared less curious. So that kind of got me started, and there were a couple of students who… one really cool kid named Joshua who was flunking every class, but he would ask again these really great questions and um, he would leave questions for me in my office on a piece of paper and it would have a question, and it would have "Think about it." And I loved it, and I told him, "Joshua, one day I'm going to write a book and you are going to

help me write it. So there was that student, and there was a student um, who one time went into the classroom and you know, they are looking at something they are supposed to not be looking at on the computer, and it had to do with Michael Jordan, and they started an argument about who is better and "I'm a Michael Jordan fan." And I'm like "Oh, Michael Jordan is so much better than Lebron James." And they are like it can't be, you know, Lebron James is better." So they had this discussion. I'm like, "Why don't you know, why don't you, who's better, da-da-da… Google it and find out." And they are like, "Really? You can Google it?" And I'm like, "Yeah." So they're all googling it and then they started having these conversations and reading it like… see, they are curious. So then I thought, what was so important for them was to be curious, and I was so… and that's where my concern started, and then I started the DOC program, but I also moved into schools that, what we call School Transformation Office, so the schools that were labelled D or F. And I began working in those schools with intermediate grades, and what shocked me is that I saw the same thing, from those students, they didn't have any questions. Then I'm like, what happened? I used to work with these students, they had tons of questions! And so, you know, I wanted to find out what happened, does curiosity diminish? Does our environment impact it? I knew that it still existed because I would do little things in the class room and they would like, start wondering or asking me questions and I had to, you know, I prompted it. And then I started the doctoral program working with higher ed, prospective teachers, and a certain professors said, "Well you know, you're here at higher ed, not all teachers, not all adults appear to be curious and I thought about, well, what happens if the students who appear not to be curious all through school years, they graduate, and then they start the Teacher Prep Program, and then they become teachers… Will they be able to foster curiosity in their students? And so I started doing some research in finding out that those prior experiences are lived experiences… I know now it's called… Actually influences what kind of teachers someone will be and the types of practices they employ even more so often than what we teach them while they are here in Teacher Prep Programs. And so, then I want to explore that further. Does that make sense?

INTERVIEWER: Yes. Absolutely. So what are your beliefs about curiosity?

SUSAN: One of the beliefs I kind of had that I feel even stronger now is that everyone is innately curious. Every individual is born curious. Their level of curiosity or extent of curiosity might differ and what their, the content might differ, but, I believe that everyone is curious. And one of the reasons why I think that is because I think that curiosity is that drive which is what I learned that one of the Seminole researchers, Berlin, he referred to it as a drive. I learned that that drive is actually what causes us to explore. Okay? So, because I am curious, I, as a baby, I will explore something nearby or when it falls, I will do it again or

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you know whatever. And then I looked at and I thought about and did some research on babies that are in orphanages who often are developmentally delayed until they are put into a different environment. And the reason why they are often developmentally delayed is because they often don't have opportunities to explore. So that made me think, well they are still curious but they are not able to explore and so, exploring helps us grow and so if we, we must all be curious because we all grow. And if we, you know it's kind of like that's what sparks us, even as adults we grow, maybe not physically, but we grow mentally, because we are curious. Does that makes sense?

INTERVIEWER: Yes. I'm learning a lot. What are your assumptions about curiosity?

SUSAN: Well, I think an assumption is that I think, still, even though, I know better that, I can identify easily somebody who is curious. And I don't think that's always true. I think it's just an assumption. I mean, it's just an assumption because like I said, it can be that maybe they're not exploring, but it doesn't mean they are not curious, so that's one.

INTERVIEWER: It sounds as though maybe it's difficult to distinguish whether or not somebody's showing they're not curious or whether or not they're just not curious. But then I think you said that everybody is curious.

SUSAN: I think everyone is curious. I think it could be hibernating, because you know maybe the practices or maybe the environment. Like if a child or adult doesn't feel comfortable in an environment asking questions, then they are not going to ask questions and we going to go, oh, they're not curious. And so, I think they have to feel safe and I think, one thing that I just recently learned is, you could be curious and about maybe even self and I don't think that shows up. Like if you have a lot of questions about why you do, what you do. My daughter, when I was talking to her, she was telling me about, you know, questions she had and most them were like, what is it about me that's causing my daughter to not behave while she's around me… Compared to her father or the teacher… Is it something I'm doing? It's a relationship but I think that's still curiosity.

INTERVIEWER: And what do you expect to find as a result of your study?

SUSAN: I kind of expect to find that the individuals that I interview are going to have a hard time coming up with experiences in which their curiosity was fostered. And I don't know if that's going to be because they can't recall or remember them, or they don't know what I'm talking about, or they haven't had that many recently, since they were a child, and they don't remember them. I expect them to… Those who are curious about things like a physical environment or physical world... I think it might be easier for them to identify,

oh that's curiosity, and tell me things they are wondering, or times when they really want to know more about something. But individuals who are curious about people… I don't know that they're going to think of that. So that's an area that I really think I need to look at, my questions, and see, am I prompting them to think that way but not, how do I say this, um not like, over-doing it, I am not leading them to it. And, you know, given that, that's the kind of curiosity I think I have, that's a fine line for me because I know that I don't want to be biased.

INTERVIEWER: So are you going to give them the definition of curiosity before they tell you about their experiences?

SUSAN: I have been told not to because it's their meaning, they attach because it's phenomenology, so it's their meaning they attach to it. But what I have so far decided on is when I ask him to tell me about some… A time when your curiosity is fostered. If they say, "I don't know." Or, "I'm not sure what you are talking about." Then I'm going to say well, was there a time when you really wanted to know something. And because Dr. Engel, she is on my committee she is one person who has written quite a bit about curiosity. That's how she defined it, as a desire to know. So if I could just maybe say it, tell me about a time you really desire to know something. And I wanted to add a desire to know something or someone. Well then I thought, that's kind of leading too. I don't know, I don't know how to word that one. Because if I say something… It kind of means an object or something… Yeah.

INTERVIEWER: I wonder if you can go about it without them knowing initially that you're talking about curiosity… And somehow just ask them about what their interests are or…. What sorts of things they've explored, or… Something that might get at them actually showing their curiosity without specifically asking about it.

SUSAN: And I wondered that too. And I don't know if that's still, if I am studying their experiences with curiosity… Then do I need to just, you know, use that terminology, or can I, am I studying something else, if I start to change it? You know…

INTERVIEWER: It's almost part of your interview with them could be…

SUSAN: Like if I just asked them about… tell me something that you've been really interested in, like I've thought about that, and… But is that different than curiosity?

INTERVIEWER: Hmm… Or even, what have your interests been? Or what were your interests in childhood? Did they change? I don't know…

SUSAN: It's a tough one. So it's all about experiences, phenomenology… So we're looking at the meaning they've placed on those experiences. I know the word "describe" comes up frequently. Describe a time when…

INTERVIEWER: Maybe describe some of your early childhood memories, because I would think that if they are things that stand out, it's important to remember that there might be times that are, you know possibly…

SUSAN: What if I asked you to remember a time where your curiosity was fostered, could you do that?

INTERVIEWER: I, I have a little difficulty understanding the way that's phrased by… When you say describe a time when my curiosity was fostered…

SUSAN: Yeah, because that's saying somebody else did it…

INTERVIEWER: Yes…

SUSAN: Can you describe a time in which you were really curious and wanted to know about something… I don't know how else to word it…

INTERVIEWER: Well, that, that brought an immediate uh… Time into my head. And as we're talking about the PhD program, I think about well my husband handed me the computer with the description of this PhD program in it and he said, "Hey, you know, I wonder if this is something you'd like to do." And I thought, wow, this looks interesting. I'm definitely curious about this program. I'm going to look into it more…

SUSAN: Then you explored further…

INTERVIEWER: Yes. I explored further… But I think the way you had it phrased before… You're talking about a time which you're curiosity was fostered… Yes, it makes me think about someone else is making me curious about something.

SUSAN: Right, and if I could just keep it to tell me about an experience in which you were really curious and wanted to know more… I wonder if I could just leave it at that… And you wanted to know more… Without saying the word something…

INTERVIEWER: I think that's pretty open-ended. And you guided the idea of curiosity…

SUSAN: Mhm… A time that you were curious and you really.. See I'm kind of giving them a definition there. And you really wanted to know more…

INTERVIEWER: And you didn't say about something or.

SUSAN: Someone…Someone. Really wanted to know more… And then, then I can prompt them. 'Cuz I have other prompts like can you tell me… Can't use the word tell me… Describe a time that you were curious about something in school… Something that happened outside of school… At home. And when they do describe something I have, you know, describe the context, the environment for me. Like let's take the one with the computer and your husband doing that. And if I said describe the context environment, could you do that? What was, what was happening?

INTERVIEWER: We were sitting on the sofa watching tv… (Laughs).

SUSAN: And who were you with…

INTERVIEWER: I was getting tired, I was with my husband, I was thinking about going to bed… When he handed me the laptop that he was… He was on… And I ended up staying up for another hour exploring the program…

SUSAN: See when you give me that information that gives me a lot more… That you've stayed up and can you tell… They do that every time… Okay. Describe your husband and his influence on your curiosity.

INTERVIEWER: Well my husband shares a lot of his thoughts and ideas with me so I guess when he tells me about something that is of interest to him then that sometimes flares my curiosity about it because if it's of interest to him and I care about him then I want to know something about it too.

SUSAN: So, right there, and I can keep this or I can shut it off but right there tells me a whole lot too. When you're um, Bandura, modeling theory and all that, that you respect him so that you're interested and because you respect him, you're going to want to model or, you know, more what he does…but also that he expands your world. Sometimes he tells you things that you didn't think of so you think about the information gap he brings. Here's what you know. He's bringing in stuff that you don't know and because you respect him, you have that respect for him… And you're interested, for whatever reason, then you are more curious… So that's kind of interesting.

INTERVIEWER: Yeah. And that just made me think about… I always thought about curiosity just kind of coming out of nowhere but there has to be some sort of knowledge-base to spark that initial curiosity. It's like…

SUSAN: Well if you think about like a baby or a toddler, you know, when they're babies, it just happens, like they, they bump into something, oh, what was that? There's not necessarily that intent. But when they become where they can use language more or they can get more mobile then they show more intent, they explore.

INTERVIEWER: But there's still a stimulus but it comes from that. The environment. More of a sensory stimulus but.

SUSAN: Yeah, that's a different curiosity I think. It's like perceptual curiosity which I read about but I'm not really going to be working with but when you have language… Enrique talks to me a lot about this… How language, he believes, is related to curiosity because it gives you the tools, you know, the cognitive tools, because until you can, you have a thought or a language for it, you can't really.

INTERVIEWER: So it sounds like there are a lot of different types of curiosity… Are you going to narrow it down?

SUSAN: Perceptual are more…More animals or um… You know, more like the baby and a sound, oh, what was that? You know, that's what a baby does. But as we mature we see either, usually, typically, diversive or specific curiosity. And that's the two that I described – diversive being breath and specific being narrower but you know, I really need to find the answer… And I think that the two work together. This is my understanding now… I think as children get older and they develop language and their world expands um… They're interested in a lot of things. They have all kinds of questions, right? So you have that two, three, four year-old with all these why kind of questions… But then as they, as schooling begins and they develop more language and they're exposed to you know, even more content that then eventually there's something that might like, hit them. Like wow, this is really interesting, dinosaurs, or whatever it might be. And then you see that depth curiosity kick in. I think you can have both but I think that they kind of work together. And um, without the breath of curiosity, the exposure and stuff, then you may never find that one thing that takes you um, deeper… Is that making any sense?

INTERVIEWER: Yeah.

SUSAN: I don't know. I just find...

INTERVIEWER: You've got to go.

SUSAN: Yeah. So what I'm going to do is just listen and… To their experiences and then I'll look at it and see, is there evidence of both, one or the other? Or maybe none at all, I don't know.

INTERVIEWER: It's going to be interesting.

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