

A PHENOMENOLOGICAL STUDY EXAMINING THE EXPERIENCES OF
HOMESCHOOL PARENTS WHO USE ONLINE COURSES AS
SCAFFOLDING TO IMPROVE THEIR CHILDREN'S SELF-EFFICACY

by

Andrew Scott Robinson

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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Abstract

The number of homeschooling families in the United States has rapidly increased since the 1970s, and in particular since the COVID-19 pandemic. This influx of families has brought differing motivations for homeschooling and expectations for curriculum. Online course implementation has been linked to improved self-efficacy, as well as science, technology, engineering, and math (STEM) career selection. The purpose of this transcendental phenomenological study was to understand how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. The theories guiding this study were Bandura's theory of self-efficacy and Bruner's scaffolding theory. Participants included 12 homeschool parents who used online courses as curriculum. Data collection consisted of individual interviews, focus groups, and journal prompts. Data analysis utilized Moustakas' process to include horizontalization, clustering into themes, and synthesis of essences. Five themes emerged from the data, including curriculum choice, communication, ownership of learning, college readiness, and viability. The implications of these findings were determined to be intentionality in online course selection, providing support rather than help, and developing lifelong learning skills. The implications for policy and practice include improving communication within online courses, focusing on the development of study skills, and offering smaller synchronous online courses to better emulate the authenticity of a traditional course.

Keywords: homeschooling, self-efficacy, scaffolding, cultural capital, socialization, STEM, online education, synchronous, asynchronous, persistence, self-regulated learning, virtual labs

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Dedication

To my Lord and Savior Jesus Christ, who gives me a future and a hope.

To my wife Emily, the love of my life. Thank you for being the best research assistant I could have asked for; I could not have done this without you. I strive to emulate the patience and kindness you show me every day. I promise I'm done with school now.

To my Mom, who homeschooled me and gave me a love of learning, and my Dad, who taught me the value of persistence and hard work. I am thankful every day for the example you both give me of how to best live my life. Thank you for encouraging and supporting me through all these years of school. A Robinson never gives up!

To my children, Juniper and Levi, trust in the Lord with all of your heart, and do not lean on your own understanding. In all your ways acknowledge him, and he will make straight your paths. I love you both.

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List of Abbreviations

Artificial Intelligence (AI)

Central Research Question (CRQ)

English as a Foreign Language (EFL)

High School Grade Point Average (HSGPA)

Institutional Review Board (IRB)

Science, Technology, Engineering, and Math (STEM)

Self-Efficacy for Self-Regulated Learning (SESRL)

Serious Educational Game (SEG)

Sub-Question (SQ)

Virtual Reality (VR)

Zone of Proximal Development (ZPD)

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this transcendental phenomenological study was to understand the lived experiences of homeschool parents utilizing online courses as scaffolding to improve self-efficacy in homeschool students. The COVID-19 pandemic has seen record numbers of families choosing to homeschool for the first time. Due to the varied nature of homeschool curriculum, care must be taken to ensure students are college or career ready upon graduation. Lamb et al. (2018) suggested that technological skills and self-efficacy are key to success, especially in science, technology, engineering, and math (STEM) college programs or careers. This chapter examines the background of this study that includes its historical, social, and theoretical contexts. The historical context of homeschooling is defined by landmark court rulings and the evolution of homeschooling as school choice. The social context of homeschooling is considered, notably strengths and weaknesses of the format, and how parents work to strengthen such curriculum. The theoretical context of homeschooling is also examined, specifically the importance of curricula choice to homeschool families and their views on educational technology. Following the background of the study, the problem and purpose statements are given. The potential significance of the study is then addressed from theoretical, empirical, and practical perspectives. After the study's significance, the chapter provides the reader with the research questions, a list of key definitions, and ends with a chapter summary.

Background

Though homeschooling has been practiced in some form for centuries, it has grown in popularity during recent years. This is largely owed to a series of Supreme Court decisions regarding home education during the latter half of the 20th century such as *Wisconsin v. Yoder*

(1972) and *Runyon v. McCrary* (1976). Homeschooling is often chosen by parents due to concerns about freedom of curriculum selection in other educational formats. Homeschool families come from a variety of demographics, but often respond positively to online curriculum when given the chance to experience it (Norman et al., 2020).

Historical Context

This study examined the lived experiences of homeschool parents regarding online courses. While homeschooling has been practiced in the United States in various forms since the founding of the nation, the modern homeschool movement is usually considered to have begun in the 1970s (Jolly & Matthews, 2020). The advent of compulsory schooling in the mid-1800s began a nationwide debate over the validity of alternative methods of instruction (such as homeschooling), but several landmark Supreme Court cases solidified the right to homeschool. *Wisconsin v. Yoder* (1972) granted Amish communities the right to abstain from public education on religious grounds. Religious freedom has subsequently been a predominant reason for parents to choose homeschooling (McCoy et al., 2018). In *Runyon v. McCrary* (1976), the Supreme Court expanded the previous ruling by stating “that while a State may posit [educational] standards, it may not pre-empt the educational process by requiring children to attend public schools” (p. 239). Thus, while homeschool curriculum must meet certain educational standards, parents are free to choose specific instructional tools (Renzulli et al., 2020). In recent years, homeschooling has undergone a rapid increase in practice. Approximately 1.8 million students were homeschooled in the United States in 2012, which rose to 2.3 million in 2016 (Ray, 2016), and almost doubled in 2020 to 4 to 5 million (Duvall, 2021). The COVID-19 pandemic has had an accelerating effect on the adoption of homeschooling. Uncertainty about the safety or academic efficacy of traditional schools has been suggested as a cause, in addition to the inherent

flexibility of homeschooling, which benefits a more mobile society (Efford & Becker, 2017).

Social Context

Homeschooling is typically defined as instruction of children in the home by one or more parents. Though somewhat similar in practice, homeschooling is distinct and separate from home learning via public or private school as commonly seen during the pandemic (Price, 2021). The distinguishing feature between the two is parental selection and control of curriculum in homeschooling. In fact, parental control of curriculum is a commonly cited motivator for making the decision to homeschool (Green-Hennessy & Mariotti, 2021). Socialization has traditionally been considered a weakness of home instruction (Neuman & Guterman, 2021). To address this issue, homeschool families commonly meet in regional groups called cooperatives to partake in social gatherings and educational experiences (Tilhou, 2019). Participating in these cooperatives or similar organizations has been suggested to help homeschool students achieve higher performance later in life due to increased opportunities to gain cultural capital before college (Hamlin, 2019). Cultural capital refers to certain knowledge or behaviors necessary to participate within a specific culture or social group (Bourdieu, 1973). Like cooperatives, online courses can provide opportunities to build cultural capital and engage in social learning if designed with these goals in mind (Lim et al., 2021). Specifically, online courses can provide a sense of community, allowing for a gain of cultural capital similar to in-person social learning organizations such as cooperatives (Chun & Qian, 2020; Komninou, 2018). Homeschool students seem to have similar college readiness as their peers in traditional education (Hercules et al., 2016). However, Bennett et al. (2017) reported that standardized testing appears to be less effective at predicting the college readiness of homeschool students. This suggests that homeschool students require additional skills or attitudes for college success beyond academic

knowledge. Additionally, self-efficacy (especially technological self-efficacy) plays a prominent role in collegiate success (Parikh-Foxx et al., 2020). The effects of cultural capital and self-efficacy on college readiness are examined in greater detail in Chapter 2.

Theoretical Context

The theoretical framework of this study focused on the use of online courses as scaffolding to improve self-efficacy in homeschool students. This study utilized Bandura's (1986) theory of self-efficacy and Bruner's scaffolding theory (Ninio & Bruner, 1978) as the basis for its theoretical framework. They were selected because technological self-efficacy has been suggested to improve student success in college programs or careers (Salhieh & Al-Abdallat, 2021). Previous research indicated that participation in online courses increases technological self-efficacy (An, 2018), thus it seems plausible that participation in online courses could result in increased student success in college and careers. Furthermore, technological self-efficacy in teachers (a role of parents in homeschooling) has been linked to implementation of educational technology in curriculum (Yerdelen-Damar et al., 2017). Scaffolding theory suggests that educational supports may be used to gain proficiency and removed when mastery is achieved. In this study, online courses were examined as educational supports with which to improve technological skills and self-efficacy in students. In this context, the support would be removed upon graduation or completion of an online course. If successful, student technological skills and self-efficacy would be improved, resulting in increased proficiency or mastery. Since homeschooling families come from a wide variety of cultural, religious, and socioeconomic backgrounds (Jolly & Matthews, 2020), methods of increasing self-efficacy must be applicable to a variety of curricula.

Dissatisfaction with the safety or quality of instruction in local public or private schools

is frequently cited as a reason for homeschooling (Ray, 2017). Conversely, freedom of choice regarding curriculum is a strong motivator for parents to choose homeschooling (Efford & Becker, 2017). Though many lack experience with the format, homeschool families seem to respond positively to online courses when given the opportunity (Norman et al., 2020). Thus, online courses may be an appropriate method of scaffolding to increase self-efficacy in homeschool students.

Problem Statement

The problem is that homeschool students may be unprepared for college or careers if they lack technological skills or experience which can be provided by online education. Success in college or careers is increasingly determined by technological skills and self-efficacy. Student technological self-efficacy is affected by prior experience with educational technology as well as teacher technological self-efficacy (Rasul et al., 2016) or in the case of homeschool families, parent self-efficacy. Due to the inherent variance in homeschool curriculum (Jolly & Matthews, 2020), homeschool students may be disadvantaged concerning technological skills and self-efficacy when compared with their peers in public and private schools. Online courses can provide a viable means of technology experiences for homeschool students (Abouhashem et al., 2021). It would thus be beneficial to investigate how online courses can be used as scaffolding to improve self-efficacy in homeschool students. A gap exists in the literature regarding how homeschool families use online courses to prepare for college or careers, especially regarding the role of self-efficacy. Investigating this phenomenon could inform beneficial changes to homeschool curriculum to better equip students for success later in life.

Purpose Statement

The purpose of this transcendental phenomenological study was to understand the lived experiences of homeschool parents utilizing online courses as scaffolding to improve self-efficacy in homeschool students. Homeschooling was defined as education occurring primarily in the home in which a parent is the primary instructor and final arbiter regarding curriculum selection (Price, 2021). Additionally, online courses were defined as educational courses conducted over the Internet either synchronously or asynchronously (Norman et al., 2020). The theories guiding this study were Bandura's theory of self-efficacy and Bruner's scaffolding theory.

Significance of the Study

This section examines the way in which the study contributed to the body of knowledge regarding the research topic. First, the theoretical perspective of the study examined the study's use of Bandura's (1986) theory of self-efficacy and Bruner's scaffolding theory (Ninio & Bruner, 1978) in relation to the problem. Second, the empirical perspective of the study was discussed, specifically existing research regarding the topic and how the study addresses a gap in research. Finally, the practical perspective explored the implications of the study results on the field as a whole.

Theoretical Perspective

The theory of self-efficacy was used as the primary framework to examine the phenomenon (Bandura, 1986). Increased technological self-efficacy in teachers has been linked to increased technological self-efficacy in students (Firmin et al., 2019). It was thus appropriate to examine how the lived experiences of homeschool parents affect their own technological self-efficacy and may lead to increased technological self-efficacy of the homeschooled student. The

theory of scaffolding (Ninio & Bruner, 1978) was utilized as a method of examining the building of technological skills via student experiences with educational technology (in this case online courses). Scaffolding is appropriate since it implies the use of supports to improve student confidence regarding their own skill levels before removing said supports when proficiency is improved. Online education acts as a controlled environment to provide support for students learning technological skills which can later be used unsupported in college and careers. In a research study by Gulhan and Sahin (2016), they found that technological skills and self-efficacy are utilized most effectively when developed early in life. Homeschool students would seemingly benefit from technology experiences in primary and secondary education.

Empirical Perspective

Though there is currently a research gap regarding the specific use of online courses by homeschool parents as a means to improve self-efficacy, related research frames this study and provides empirical support. Bandura (1986) stated that self-efficacy is “concerned with perceived operative capability, not inherent skill” (p. 368). Norman et al. (2020) reported that homeschool parents were often initially leery of online courses but viewed them positively after having the chance to utilize them. Together these studies suggest that hands-on experience with online courses increases self-efficacy in homeschool students as well as perceived value of online education. In a meta-analysis by Belland et al. (2017), they found that computer-based scaffolding in STEM courses could provide effective differentiated instruction when measured by academic performance. In another study by Sithole et al. (2017), they determined that persistence and retention in STEM degree programs and careers are affected by student self-efficacy. This suggests that the success of homeschool students later in life could be positively influenced by participation in online courses as a means to improve self-efficacy.

Practical Perspective

This study sought to examine the lived experiences of homeschool parents utilizing online courses as a means of providing scaffolding to increase the self-efficacy of their children as a means of college or career preparation. Research has indicated that online courses are a viable method of improving student technological self-efficacy (Sarac, 2018). Self-efficacy in turn is linked to increased selection of STEM college programs or careers later in life (Gulhan & Sahin, 2016). STEM careers are expected to increase in demand and in salary in coming years (Sithole et al., 2017). Thus, understanding how the worldviews and attitudes of homeschool parents affect their decision to integrate educational technology (in this case online courses) into the curriculum of their children could help identify what lived experiences encourage the adoption of technology and a subsequent increase in self-efficacy. This in turn could help predict what parental perceptions and beliefs are linked with homeschool student success later in life.

Research Questions

The following research questions were derived from the theories of self-efficacy (Bandura, 1986) and scaffolding (Ninio & Bruner, 1978). The theories were used in conjunction with the existing body of research regarding homeschooling and online education. The questions sought to address the problem of lack of college or career readiness in homeschool students regarding self-efficacy as detailed previously.

Central Research Question

How do homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of preparation for college or careers in STEM fields?

Sub-Question One

How do online courses provide homeschool students with performance accomplishments that increase self-efficacy as well as STEM career selection?

Sub-Question Two

How does participation in online courses affect college/career readiness via academic persistence in homeschool students, especially regarding STEM topics?

Sub-Question Three

How does participation in online courses affect the ability of homeschool students to develop higher order skills from component skills?

Definitions

1. *Homeschool* – Education occurring within the home in which parents are the primary instructors and determiners of curriculum (Price, 2021; Ray, 2016).
2. *Self-efficacy* – Individual perception of skill level or competence regarding a task or domain. A common sub-category is technological self-efficacy, which refers specifically to perception of technological skill level (Bandura, 1986).
3. *Scaffolding* – The use of educational aids to provide support while student proficiency develops. These supports are removed gradually as mastery occurs (Ninio & Bruner, 1978).
4. *Cultural capital* – Knowledge of social cues and behaviors which allow for acceptance and participation within a societal group (Bourdieu, 1973).
5. *Socialization* – Regarding homeschooling, the facilitation of adequate social development for children by providing social learning experiences (Guterman, 2020).

6. *STEM* – Fields of study related to the domains of science, technology, engineering, and mathematics (Yildirim & Selvi, 2017).
7. *Online education* – Defined for this study as either synchronous or asynchronous online courses lasting at least 8 weeks (Norman et al., 2020).
8. *Synchronous* – Online education which occurs at a set time, usually due to a live video component (Abouhashem et al., 2021).
9. *Asynchronous* – Online education which does not have set class times (Green-Hennessy & Mariotti, 2021).
10. *Persistence* – The resilience needed to continue a task even if it is difficult (Sithole et al., 2017).
11. *Self-regulated learning* – Student ability to effectively focus and complete learning tasks without direct oversight of an instructor (Xu et al., 2022).

Summary

The uncertainty of the COVID-19 pandemic drove many to make unprecedented changes. The rapid increase in families practicing homeschooling is one such example (Hamlin, 2020). When the historical context of homeschooling is examined, however, it is evident that the pandemic only accelerated a trend which already existed. Parents use homeschooling as a means of exercising freedom to choose their own curriculum (Ray, 2017). Since homeschool families are by no means a homogenous demographic, reasons for homeschooling are varied but often include dissatisfaction with local public or private schools (Efford & Becker, 2017). The problem is that homeschool students may be unprepared for college or careers if they lack technological skills or experience due to an accompanying lack of self-efficacy. With that in mind, the purpose of this transcendental phenomenological study was to understand how

homeschool parents utilize online courses as scaffolding to increase student self-efficacy as a means of college or career preparation. This is significant because online courses can be a means of improving student technological self-efficacy, which in turn improves likelihood of success later in college or careers (Darling-Aduana, 2021). The lived experiences of parents revealed what perceptions and beliefs are more likely to result in parental selection of online courses as curriculum for their children.

CHAPTER TWO: LITERATURE REVIEW

Overview

This literature review will examine existing research pertaining to the lived experiences of homeschool parents utilizing online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. The theoretical framework for this review will utilize Bandura's theory of self-efficacy and Bruner's scaffolding theory. This chapter will empirically examine the context of this research study in the existing literature and the research gap therein. Self-efficacy and scaffolding will be examined in greater detail in the subsequent Theoretical Framework section. Following this, the Related Literature section will examine the literature gap regarding this study's topic. It will be divided into three main sections. First, an overview of home education will be presented, including values and beliefs of homeschool families, homeschooling as school choice, public school via home learning, technological self-efficacy in homeschool students, and college/career readiness in home education. Next, attributes of effective online courses will be described, including scaffolding in online courses, STEM topics in online learning, and virtual learning. Finally, the relationship between online courses and later college/career selection will be examined, including elements of online course design, self-efficacy in online courses, and STEM career selection. A brief conclusion will summarize the findings of the chapter.

Theoretical Framework

College and career readiness of children is a universal concern for parents regardless of educational approach. The theories of self-efficacy (Bandura, 1986) and scaffolding (Ninio & Bruner, 1978) were chosen as the theoretical framework of this study to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their

children and consequently improve career and college readiness. The theory of self-efficacy was developed by Bandura in 1986. The main premise of the theory is that one's individual perception of skill level affects performance. This implies that student academic performance is directly related to confidence and self-image. Thus, improving academic performance involves both equipping students with skills and knowledge as well as improving a student's self-perception of abilities. A commonly discussed subset of this theory is technological self-efficacy, which focuses specifically on performance with technology-based skills. Existing research suggests that technological self-efficacy is linked to selection of STEM careers or college programs as well as persistence in such programs (Cabell, 2021). Furthermore, experience with technology (such as online courses) has been examined as a means of increasing technological self-efficacy in students (Chang et al., 2022). Thus, the theory of self-efficacy is used in this review as a means of examining how online courses are used by homeschool parents to improve student confidence and self-image (self-efficacy) which in turn improves college or career readiness. This study examines the use of online courses as a type of scaffolding to facilitate this self-efficacy improvement.

Scaffolding theory was developed by Jerome Bruner as an evolution of Vygotsky's (1978) concept of zones of proximal development (ZPD). The ZPD concept is part of Vygotsky's sociocultural theory, which also includes other components such as private speech and culture-specific tools. The main theme of the sociocultural theory is that social learning must occur before cognitive development. Scaffolding refers to the practice of using educational supports to aid the performance of novice students (Ninio & Bruner, 1978). As a student's skill level improves, the supports are slowly removed until the student is performing the tasks unassisted. Scaffolding is considered a variation of ZPD theory as it utilizes external supports to

improve student performance. While these modifications were initially contrived as social learning in the ZPD theory, supports in scaffolding often take the form of learning tools or techniques (Belland et al., 2017).

Self-Efficacy

Self-efficacy provides a suitable theoretical framework for this research study due to its focus on the effect of self-image and self-perception on performance. This study investigated how online education is being used by homeschool parents to alter the self-image and self-perception of their children to help them become more career or college ready. Rather than examine how online courses directly affect academic performance, the focus of this study was on a cause of improved academic performance (self-efficacy). Self-efficacy was examined in two ways: academic persistence (the ability of students to overcome difficulties while completing academic studies) and the utilization of performance accomplishments to provide a sense of achievement to students. Both topics are related as performance accomplishments improve academic persistence when used within a curriculum. In this way online courses improve self-efficacy by functioning as scaffolding, which is described in the following section.

Scaffolding

Scaffolding refers to educational supports which are provided to aid students in developing skill mastery. If the supports are removed too quickly, students may become overwhelmed; therefore, the key is to remove them in small stages. This study viewed online courses as a means of providing scaffolding to improve self-efficacy in homeschool students to increase college/career readiness. Online courses function as scaffolding by allowing students to build skills in safe, controlled environments. By utilizing performance accomplishments as described above, online courses could increase student self-image and self-perception regarding

competence with technological skills or content knowledge. By applying scaffolding to educational technology usage (i.e., online courses) as a means of improving technological skill via gradual practice in a controlled environment, college or career readiness could ultimately be improved. Scaffolding naturally goes together with the theory of self-efficacy since both emphasize the importance of building confidence in learners. The supports provided by online courses can take many forms, such as students' access to a broader learning community, the ability to provide differentiated education, up-to-date curriculum, and integrated multimedia content. Notably, these features have been linked to improved student academic performance in online STEM courses (Smith, 2021), which have traditionally been more difficult to adapt to the online environment due to the lab-based nature of the coursework. The effect of scaffolding on online STEM course effectiveness will be briefly addressed in this literature review.

Related Literature

This literature review will examine homeschooling and online education to provide context for the lived experiences of homeschool parents participating in this research study. The difference between traditional homeschooling and public school via home learning will be examined to distinguish between them and frame the boundaries of the study. The values and beliefs of homeschool families and the decision to homeschool as school choice will be investigated. Technological self-efficacy as an attribute of homeschool students will be explored, as will the way it contributes to college and career readiness. Next, the review will discuss attributes of effective online education. These include scaffolding as a way to provide learning supports, as well as ways to improve student technological self-efficacy. Emphasis is given to STEM topics in online learning, especially regarding virtual learning, due to the technology emphasis within the domain. Finally, online learning will be examined through the lens of

college and career readiness. Emphasis will be given to elements of course design and selection of technology careers (STEM).

Home Education

Prior to the start of the COVID-19 pandemic, there were estimated to be approximately 2.5 million homeschool students in the United States (Ray, 2016). That number is believed to have almost doubled to 4–5 million students during 2020 (Duvall, 2021). Though it is often clumped together as one group, the homeschooling population of the United States utilizes a wide variety of curricula and instructional techniques (Saiger, 2016). State regulations regarding homeschooling vary across the nation. Some states require assessments or evaluations of students, such as North Dakota, while others do not (Carlson, 2020). Homeschool families come from a variety of cultural, religious, and socioeconomic backgrounds (Jolly & Matthews, 2020). As such the reasons for homeschooling are not necessarily uniform (Carlson, 2020). This literature review defines home education as instruction of children by a parent or parents. Though public school via home learning will be discussed, it is not considered homeschooling for the purpose of this review (Price, 2021). The reason for this is that parental control of curriculum, which is present in traditional homeschooling but absent in public school via home learning, allows for the selection or rejection of online courses, which are the focus of this study (Green-Hennessy & Mariotti, 2021). Homeschool parents who ultimately chose to utilize online courses as curriculum require the freedom to make curricular choices for their children.

Values and Beliefs of Homeschool Families

Homeschool families in the United States come from a wide variety of cultural, religious, socioeconomic, and racial demographics (Watson, 2018). Although cultural stereotypes in America portray homeschool families as predominantly religious, in fact families choose to

homeschool for a variety of reasons (Ray et al., 2021). Green-Hennessy and Mariotti (2021) noted that about half of homeschool families were “first-choice,” indicating home education was chosen over other curricular methods, while the other half are “second-choice,” meaning they came to homeschooling reluctantly after other curricular methods failed to meet their educational needs or expectations for their children. An example of second-choice homeschooling would be how some parents in California chose to homeschool their children as a means of bypassing the state’s mandatory vaccination requirements for children in public schools (Mohanty et al., 2020). Within the first-choice parents, about half chose homeschooling for ideological reasons (such as religion), while the other half chose homeschooling for pedagogical reasons (such as flexibility). Dennison et al. (2020) noted that homeschool families come from varying socioeconomic levels and thus have differing resources and opportunities available to them. Dennison et al. further elaborated that homeschooling was more difficult for families in lower socioeconomic classes since it requires that a parent stay home rather than work. It was also noted that a level of trust must exist between families and the government for participation in public education to be viable and that homeschooling is the result of a lack of trust (whether justified or not). Hamlin (2020) noted the importance of cultural and family activities to homeschool families, suggesting they are more likely to participate in such activities than their peers. Additionally, Hamlin indicated that homeschool students tended to be positive about communicating their educational experiences with others and tended to perform well academically later in life, although other research suggests that homeschool students often require an adjustment period to the undergraduate setting (Thomas, 2018). Participants in Hamlin’s study were from homeschool families who were members of cooperative groups, indicating the utilization of social learning by homeschool families. This is noteworthy because socialization has stereotypically been

considered a weakness of the homeschool method (Guterman, 2020). Vygotsky (1978) suggested that social learning enables students to perform tasks outside of their current ability by allowing peers to serve as scaffolding. Homeschool parents thus prioritize opportunities for their children to engage in extracurricular learning communities for the potential benefits of scaffolding via social learning. These learning communities can take a variety of forms, from strictly academic groups to athletics or church groups (McCabe et al., 2021). Research has indicated that homeschool students may be more comfortable interacting with those of differing age groups across unique environments than their peers in public or private school (McCabe et al., 2021). Cooperatives and other social learning communities can also provide the opportunity to acquire greater cultural capital before entering a collegiate environment (Hamlin, 2019). Stephens et al. (2018) conducted a study to compare the usage of linguistic choices of homeschool students with those of their peers in public or private school. They specifically investigated the use of a variety of slang and colloquial phrases by homeschool students. It was determined that there were not distinct sociolinguistic profiles among homeschool students, suggesting that homeschool students are linguistically very similar to their peers. This could further indicate that homeschool students possess enough cultural capital to interact easily with their peers in public and private schools.

Homeschooling As School Choice

Dissatisfaction with regional or national school choice has traditionally been a determining factor in selection of homeschooling by parents. Ray (2017) noted that a variety of factors can influence parents to homeschool their children, including concerns about safety or peer pressure, lack of moral or religious education, and declining academic standards in public schools. African American parents specifically cited the desire to give their children a better

cultural education and avoid racism that was prevalent in the public school system. Overall, the common theme among parental decisions to homeschool was the view that homeschooling could provide a more authentic, safer, and/or flexible education than the school system. Green-Hennessy and Mariotti (2021) noted that prior to leaving public school systems, it is common for homeschool students to have greater rates of absence than their peers, often indicating dissatisfaction with the local district. Furthermore, the same study indicated that students are more likely to have experienced bullying in the year prior to beginning homeschooling than their peers. Neuman and Guterman (2021) suggested that decreasing quality of education and increasing violence in public schools is driving parents toward homeschooling. Substance abuse risk in homeschool students tends to be lower than average, which may also contribute to selection of the educational format by parents (Schepis et al., 2020). A study by Efford and Becker (2017) investigated curricular freedom as parental motivation for homeschooling. They further elaborated that increased incidence of teacher burnout and alienation between students and teachers lower the overall quality of public education in the United States. These authors examined a series of interviews with homeschool parents regarding their experiences using curriculum selection to improve student learning. The data from the interviews in this study revealed that homeschool parents found curriculum selection to be a main motivating force in the initial decision to homeschool as well as one of the prominent methods of improving student educational experiences and academic success. In addition, the parents who were interviewed in this study suggested that a lack of flexibility in the public/private school systems as well as a lack of focus on creative thinking in the same contributed to the decision to homeschool. Success in fostering student creativity reaffirmed the choice to leave traditional school. In the same vein, a study by Firmin et al. (2019) examined the perspectives of homeschool parents regarding their

perception of educational success in their children. These researchers interviewed and recorded 15 homeschool parents who considered themselves to be “successful” (i.e., students achieved high scores on standardized testing). They found that parent self-efficacy was relatively independent of student success and instead linked to parental sense of involvement in the educational process. This again suggests that freedom regarding curriculum selection is valued by homeschool parents. Pannone (2019) concluded in a study on library usage by homeschool students that the ability to make curriculum choices is highly prized by homeschool families. Tilhou (2019) reviewed research pertaining to reasons for parental selection of homeschooling as an educational method, values and beliefs leading to this decision, and the effect of homeschooling on the development of children and adolescent students. Most research reviewed by Tilhou (2019) was conducted as direct surveys of homeschool cooperatives at the local level. A variety of reasons for the selection of homeschooling were noted, including the ability to include faith in instruction, disagreement with predominate worldviews being taught in public/private education, increased time together as a family, and ability to provide greater differentiation to instruction. Tilhou also identified several viewpoints in participant families as the impetus for homeschooling, namely the importance of family, emphasis on faith and religious education, the necessity of flexibility in education, need for differentiation, and criticism of the public school system. In general homeschooling tended to instill excitement for learning in students, increase acceptance of others when in a cooperative setting, and deepen bonds of family.

Public School via Home Learning

Though both are often referred to as “homeschooling,” the use of home learning by public and private schools is distinctly different from traditional homeschooling. One of the most

prominent differences that manifested during the early days of the COVID-19 pandemic regarded social learning. Traditional homeschooling has typically been loosely organized as connected family units (such as cooperatives) since the beginning of the movement. Because geographical distance has always been the norm, traditional homeschool curriculum was already optimized for the shutdowns of 2020. Conversely, public and private school curriculum required swift adaption to be functional for distance education. Parents of students in home learning also commonly expressed dissatisfaction with the implementation of such programs as they often shifted a greater burden onto parents (Fontenelle-Tereshchuk, 2021). Though homeschool families still struggled to respond to the pandemic (Harper & Brewer, 2021), the nature of the instructional method resulted in a slightly easier transition to the new paradigm than public or private instruction. This can likely be explained to some degree by Vygotsky's ZPD concept from his sociocultural theory (Vygotsky, 1978). Since many homeschooling families had already implemented alternative methods of social learning instead of regular in-person instruction (such as online classes, groups, or occasional co-op meetings), their social learning environment was less disrupted than their peers in public or private school (McCabe et al., 2021). The bulk of social learning (the ZPD) of public and private schools took place in brick-and-mortar schools, resulting in a more difficult transition to distance education. It could thus be inferred from these events that curriculum is most effective in the setting it is designed for. Online courses should be designed from the ground up specifically for a homeschool environment to provide effective instruction for that demographic.

Technological Self-Efficacy in Homeschool Students

Due to the demographic variety mentioned previously, homeschool families have differing perspectives regarding technology. Some focus on traditional educational methods and

curriculum, while others incorporate educational technology into instruction. Research indicates that many homeschool families are open to the addition of technology to curricula when given the opportunity to do so. Norman et al. (2020) examined the views of homeschool parents and students toward online courses offered by a local public school system. They found that most parents initially lacked knowledge and experience regarding online courses but responded positively to them after the study. The main reservation mentioned by parents was concern over parental ability to view assignments and curriculum in public school-hosted courses. The homeschool students performed well in online courses and responded positively to the platform in post-study interviews. It was noted that synchronous online courses did a better job at facilitating social learning (and consequently improving student performance) as they provide opportunities for real-time interaction between students. Norman et al. further noted that participants had to juggle both verbal and non-verbal forms of communication in the synchronous environment which, when combined with learning to use a new technology platform, was initially overwhelming for some students. Yener et al. (2021) indicated in the conclusion of their study that technological self-efficacy can help negate technostress, i.e., feelings of being overwhelmed by technology, by helping individuals better manage their technological time usage. In their study they indicated that technological self-efficacy could thus indirectly help improve worker performance. Although not traditional homeschooling, Bonanati and Buhl (2021) examined the technological self-efficacy of students in home learning situations. Parental support was also noted in technological self-efficacy development and categorized according to four dimensions: stimulation, instructions, interactions, and modeling. Stimulation refers to access to technology, instructions refers to directions from parents, interactions refers to active co-use of technology with parents, and modeling refers to parental

values regarding technology. It was found that several factors contributed positively to technological self-efficacy growth of students participating in home learning, including familial cultural capital, parental attitudes toward the Internet, and shared family Internet activities. Bonanati and Buhl suggested that access to technology does not itself automatically improve technological self-efficacy but rather it is how the technology is used that matters. Parental support and involvement seemingly greatly improve the technological self-efficacy gain in students in home environments. The positive effect of parental involvement on self-efficacy is indicated in a study by Lv et al. (2018). They found that a variety of parental interactions with children improved self-efficacy, namely father–child and mother–child interaction, as well as mother–child communication. Self-efficacy improvement was seen across a variety of domains, including academic, emotional, and social self-efficacy.

College and Career Readiness in Homeschool Education

College and career readiness is a common benchmark used to determine the effectiveness of a curriculum or educational method. College and career readiness would thus be important to homeschool parents and likely affect curriculum selection. The lack of a formal laboratory setting in both homeschool learning environments and online distance laboratory science courses seemingly separates both formats from traditional science courses (Gann & Carpenter, 2017). Despite this, research has indicated that homeschool students achieve similar levels of readiness for college courses as their peers in public and private school, such as in a study by Hercules et al. (2016). In this study they examined the college readiness of homeschool students by assessing their performance in a college preparatory chemistry course as well as student perception of laboratory activities. It was found that the homeschool students were able to successfully

complete the chemistry course, indicating readiness for college laboratory science courses. Additionally, student views toward the lab activities were overall positive.

Another common method to gauge college readiness is the use of standardized testing such as the SAT or ACT. Yu et al. (2016) conducted a study to determine whether standardized testing and high school grade point average (HSGPA) provided an accurate prediction of later college success in homeschool students. They compared SAT scores and HSGPA of homeschool students with their overall college freshman GPA. The authors found that while SAT scores were in fact a good indicator of college performance, HSGPA was not. These results suggest that the lack of uniformity in homeschool curriculum can result in GPA inaccuracies. Bennett et al. (2017) examined the accuracy of standardized testing (such as the ACT) in assessing college readiness of homeschool students. They conducted their study at a small religious private college in the southern United States. It was discovered that there was no discernable difference in average GPA between homeschooled and traditional students. The study also found that while homeschool students performed at least as well as their traditionally schooled peers on college entrance exams, the exam scores were not always a reliable predictor of collegiate success in homeschool students.

Overall, both GPA and college entrance exam scores seem to be less reliable predictors of collegiate success in homeschool students than in traditional students. A study by Marks and Welsch (2019) in Wisconsin found that a significant number of families stopped homeschooling their children during the last two years of high school. The number of students returning to public or private schools from homeschooling was higher in urban districts, districts with higher than average expenditures per pupil, districts with higher than average student test scores, and districts with larger Catholic populations. The findings from this study suggested that

homeschool families may consider public or private school districts to be better able to prepare their children for college if they appear better funded, more effective, or more friendly to religious groups. These authors also found that some parents find homeschooling to be lacking in its ability to prepare students for college, doubt their own ability to prepare their children for college, or some combination of the two. Marks and Welsch's study further found that districts with a higher number of homeschool students tended to have lower than average test scores. Since homeschool students did not participate in the district testing and thus did not contribute to the average, this suggested that homeschool students had higher than average test scores, potentially indicating college readiness.

Effective Online Education

To be effective, online courses require different design considerations from the ground up when compared to traditional curriculum (Procko et al., 2020). The COVID-19 pandemic illustrated that rapidly changing in-person courses to distance learning results in an unoptimized learning environment and frustrated stakeholders (Fontenelle-Tereshchuk, 2021). It is thus vital to create effective online courses which utilize learning techniques appropriate to the medium. If properly utilized, online courses offer a way to improve both student technology skills and technological self-efficacy, attributes which have been linked to increased academic performance and success in college or career later in life (Hart et al., 2019). This is vital since job productivity and skill levels later in life are associated with participation in educational technology as a student (Rasul et al., 2016). The following sections include discussions on a variety of characteristics found in effective online courses.

Scaffolding in Online Courses

Scaffolding is the use of learning supports which can gradually be removed as students achieve mastery of a topic or skill (Ninio & Bruner, 1978). Scaffolding is a method by which students can receive learning support early on when skill levels are low, then gradually have the supports removed once proficiency is gained. Due to its flexible nature, scaffolding is commonly used to provide differentiated learning to students. Scaffolding is inherently flexible, allowing implementation in many educational settings, such as online courses. Belland et al. (2017) conducted a meta-analysis in which they examined the effects of computer-based scaffolding in STEM courses on student cognitive outcomes. The meta-analysis was used to specifically examine within-subject pre-post differences in student performance when utilizing computer-based scaffolding. They found that scaffolding was beneficial nearly across the board. Academic performance increased for students of all populations, education levels, and across different methods of assessment. Notably, the effect size was largest for students with learning disabilities ($g = 3.13$), indicating that the scaffolding provided effective differentiated learning. This suggests that scaffolding is useful in computer-based learning and may be a valid method of increasing student academic performance in online courses. Additionally, scaffolding may be a viable option for providing learning support to homeschool students coming from a variety of curricular backgrounds, as it was able to effectively provide differentiated instruction.

As scaffolding is identified by its ability to provide support to learners, it could potentially be useful in bridging gaps in student technological self-efficacy regarding online learning. Salem (2019) researched the viability of using scaffolding to create a sheltered online learning environment. It was determined that learning within such an environment occurs in three distinct stages. First, a preparatory stage occurs in which learners became familiar with the

platform and gather data. Second, learners refine data and draw conclusions from it. Third, students cooperate, make final decisions, and publish final conclusions through vocalizations. Salem further noted that scaffolding is viable across various disciplines but that teachers must not focus exclusively on teaching how to use the learning platform rather than the subject matter.

Richardson et al. (2021) investigated what specific types of scaffolding were commonly being used in online courses. Five different varieties of scaffolding were identified. Conceptual scaffolding focuses on guiding the thought processes of learners through the use of problems and examples. Metacognitive scaffolding requires learners to consider the thought process itself and is often reflection-based. Procedural scaffolding utilizes resources and tools and is commonly used in tutorials. Strategic scaffolding typically requires the learner to develop multiple ways to solve a problem in order to develop alternate methods of thinking. Finally, motivational scaffolding works toward the development of goals and mastery via regulation of emotion and self-efficacy. Learning objectives and student needs should thus be considered before selecting a method of scaffolding for an online course.

Marquis (2021) advised that formative assessment can be effectively used within online courses to both assess the effectiveness of scaffolding and encourage student engagement with available learning supports. This author further noted that effective formative assessment must be authentic and require learners to apply knowledge and skills. In this way effective scaffolding provides educational support while encouraging learners to look outside the course and apply the content to real life. In addition to content knowledge, scaffolding in online courses can potentially be used to develop academic skills which could prove helpful to students later in life.

Song and Kim (2021) investigated the effects of scaffolding usage in online courses on the ability of students to use self-regulation as they learn. Self-regulated learning in this context

refers to the ability of students to plan, make goals, manage time, stay engaged, and reflect. These authors found that students who participated in online courses which utilized scaffolding were better at self-regulation. It was noted that for scaffolding to promote self-regulated learning, it must provide adaptive, timely, and calibrated feedback to each individual student. This feedback allows students to build learning skills via metacognition and development of educational strategies.

STEM Topics in Online Learning

STEM content areas such as laboratory science courses provide an extra challenge for implementation online due to their hands-on skill-based nature. In general, STEM education has a heavy focus on skill acquisition rather than strictly comprehension. To address this, inquiry-based learning and project-based learning are both common instructional methods in online STEM courses. Research indicates that application of STEM topics and educational techniques in curricula have positive effects on overall student performance. Yildirim and Selvi (2017) found that when the application of STEM topics focused on mastery learning it resulted in increased student motivation towards academic achievement and interest in STEM topics. Furthermore, the use of STEM topics in curriculum tended to increase student retention of learned information. It was noted that for an increase in scientific inquiry-based skills to occur, instructional time must be spent on the scientific method, indicating that course content was equally important to method of delivery. Sarac (2018) found in a meta-analysis that application of STEM educational practices and curricular topics increased student academic achievement and motivation. Sarac also indicated that the introduction of STEM topics resulted in an increase in scientific inquiry-based skills, which again suggested that well-crafted content is vital to student acquisition of scientific inquiry-based skills. Wu et al. (2019) recommended the use of

adaptive scaffolding in STEM course design as a means of responding to student feedback and creating a collaborative learning environment. In their study, they compared the use of static scaffolding (which was pre-generated before the study began) and adaptive scaffolding (which utilized human tutors to provide specialized feedback and instruction to students). It was found that the adaptive scaffolding resulted in participants displaying increased comprehension of alternate viewpoints and design-based thinking. The question still remains, however, if online courses are a viable method for delivering effective laboratory science courses.

Kahn et al. (2022) examined how the pandemic-necessitated switch to online learning in STEM topics affected students with disadvantages, such as students from lower socioeconomic backgrounds, students who were part of minority populations, or female students. The researchers found that these students were negatively impacted by the switch to online learning due to lack of access to technology, reliable Internet, quiet places to study, and peer support. Interestingly enough, none of the students were negatively impacted by the lack of physical laboratory activities, which traditionally have been viewed as the greatest hinderance to the effectiveness of online STEM courses. This indicates that the online platform is feasible for effective STEM courses but requires adequate resources and supports to be viable for all students. Stoeger et al. (2019) echoed a suggestion mentioned previously by Wu et al. (2019) that mentoring can be an effective means of improving student performance in online courses. In their study, Stoeger et al. examined the effect of online mentoring on the performance of teenage female students in online STEM courses. Students who participated in online mentoring reported a positive change in their online learning environment as well as an increase in educational capital. It was noted that mentoring programs are typically only effective if utilized for an extended period (i.e., a single session may not affect student academic performance).

Difficulty in enforcing academic honesty is sometimes cited as problem area for online courses, especially those with rigorous exams common in STEM topics. Smith (2021) suggested that the emergent use of smartphones and/or video conferencing tools can provide a method of monitoring students during such exams by requiring students to scan their study space prior to testing. It was noted, however, that though the scanning was highly effective at preventing cheating, students greatly disliked the invasive methods used and quickly grew frustrated. It is also questionable whether such measures would be well-received by homeschool families, since curricular freedom is highly prized by homeschool parents.

Virtual Learning

Quickly developing online courses in response to the pandemic has been challenging for all disciplines (Dhurumraj et al., 2020), but STEM courses are arguably the most difficult to effectively design even in ordinary times due to the hands-on nature of laboratory courses. Abouhashem et al. (2021) conducted a study to investigate methods of minimizing the limitations of the virtual environment in online STEM courses. The authors noted that effective online courses can leverage the strengths of the virtual format to balance out its inherent weaknesses. If implemented correctly, multimedia content can be beneficial to students, including simulations, videos, presentation, and game-based learning. The authors also noted that accurate feedback is necessary for student success in an online setting. Without such feedback, learners had difficulty identifying expectations and tended to grow frustrated or apathetic. The self-efficacy theory (Bandura, 1986) suggests that positive self-image regarding competence is vital for learners to succeed. Without adequate feedback mechanisms, learners may have difficulty assessing their own competence and thus would be unable to improve their self-efficacy. It could thus be inferred that the technology itself being used is less important than the

skill with which it is implemented within the coursework. Johnson-Glenberg et al. (2021) designed a study with this concept in mind which sought to examine whether 3D virtual reality (VR) was a more effective platform to host STEM courses than 2D traditional PCs. Additionally, two differing experiences were compared on each platform: high embodied (which allowed participant interaction via mouse/controller) and low embodied (which strictly allowed video playback with no interaction). It was found while high embodied VR was slightly more effective than high embodied PC, low embodied VR was the least effective of all four methods. Johnson-Glenberg et al. concluded that while VR could provide a slight edge due to its immersive nature, if improperly implemented it was worse than traditional 2D virtual learning. This suggests that utilizing technology effectively is far more important than focusing on the newest technology when creating online courses. Since homeschool families have varying degrees of resources and access to technology, it is useful to note when designing online courses for homeschool students that older technology can still be used effectively. Due to the homeschool preference for curricular flexibility mentioned previously, the potential of self-directed learning could feasibly make online courses an attractive option for homeschool families.

Truchly et al. (2019) examined the effectiveness of self-directed online STEM courses which offered virtual laboratory experiences. Student motivation toward learning as well as knowledge acquisition notably increased after participation in the self-directed virtual laboratory experiences. Truchly et al. also noted that any limitations of the virtual platform were negated by improving student sense of ownership regarding their learning. Since homeschooling by nature lends itself well to self-directed learning (due to the lack of a traditional educational organization), online courses could be well-suited to home education if they similarly prioritize student agency. It was noted in a review by Kefalis and Drigas (2019) that online laboratory

courses are typically as effective as traditional laboratory courses if implemented effectively, with the caveat that the online platform is most effective for basic laboratory courses and decreasingly effective as the courses grow more advanced. This suggests that although the content and quality of instruction is perhaps most vital to effective online education, immersion still plays an important role in learning advanced STEM techniques and concepts. West et al. (2021) suggested that within online STEM courses, students require the least guidance regarding discussion after activities, drawing conclusions from data, and orientation to the learning platform and task, while more support (i.e., scaffolding) is needed when conceptualizing tasks or skills and investigating during experiments. West et al. further suggested that scaffolding in the form of increased feedback should be used to guide students through more difficult tasks while less support is needed on tasks which students feel comfortable with. This would in turn give students the chance to improve their own self-efficacy by increasing their sense of competence regarding the course content.

Online Learning and College/Career Selection

The educational repercussions of the COVID-19 pandemic provide a useful case-study regarding the use of online instruction in a homeschool-style setting. Few educators will likely forget the scramble in early 2020 to shift from a traditional curriculum to an online format. Though many districts had experimented with online education for certain courses, implementation which was intended to occur over years happened overnight. The success of such courses has been debatable. Due to the almost non-existent timeline for implementation, many online courses developed in response to the pandemic have seemingly adopted the relative isolation of homeschooling without utilizing its inherent flexibility (Thomas, 2016). In light of these events, it is thus useful to investigate how online courses might be optimized to improve

their effectiveness in leveraging the strengths of the platform (such as flexibility and multimedia integration) while minimizing its weaknesses (such as isolation and technology limitations). To that end, this section will examine common elements of effective online course design, as well as how STEM career selection is affected by online course participation by students.

Elements of Online Course Design

As discussed previously, special consideration is required when adapting traditional classes to an online format. It may in fact be better to design such courses from the ground up for online delivery rather than convert existing traditional curricula. Research in recent years has focused on determining what design elements should be incorporated into online courses. Chen et al. (2018) performed a research study to determine which design elements had the greatest effect on student learning and performance in online STEM courses. They found that active learning activities, strategies for interactive engagement, and robust assessments had the greatest positive impact on student academic achievement. These activities effectively increased immersion and the authenticity of instruction, factors which are often lacking in online coursework. Chen et al. also noted that balancing student freedom with course structure is necessary to create an optimal learning environment. They elaborated that with too little freedom students can feel stifled and become apathetic, but with too much freedom it can be difficult for learners to determine what the learning goals are, resulting in missed objectives. Tibi (2018) examined this phenomenon by comparing structured and unstructured discussion posts in online undergraduate courses. The author discovered that students preferred the structured discussion posts to the unstructured posts and had higher academic performance as a result. This is a prime example of scaffolding, as student performance increased in the presence of a support. Using scaffolding, structured assignments could be used initially before gradually shifting to

unstructured assignments as students gain confidence in their own proficiency. Darling-Aduana (2021) found that marginalized groups (such as students from lower socioeconomic backgrounds) did not perform as well in online courses compared to their peers due to a lack of technological skills and experience. This further emphasizes the importance of supports in online education.

Effectively moving a course from a face-to-face environment to an online environment has become a hot topic due to the pandemic. Sommer et al. (2019) documented the process of moving a traditional course to a massive open online course (MOOC) design. The class being converted to online format was a sample analysis course for social and behavioral researchers. To accomplish this, the authors used backward design as an instructional framework. This requires considering the end goals of the course and crafting instruction specifically to meet those goals, rather than simply converting offline activities directly to the MOOC. Sommer et al. found backward design to be an effective method for moving traditional courses online when combined with other technology-focused frameworks such as the cognitive theory of multimedia learning. This allowed for the strengths of the online platform to be used strategically to achieve the learning goals of the course. This brings up the point that for online courses to be as effective as traditional courses, they must be designed with the strengths of the platform in mind. For this to occur, designers must know what platforms the course will be presented on (i.e., computer, smart devices, etc.) and craft instructional content which will function effectively on them.

Baldwin and Ching (2018) created a unified list of design principles for online courses which were indicated by supporting literature and results from online course design surveys. They determined that the following components were present in effective online courses: availability of objectives; stated expectations regarding communication and participation; stated

expectations regarding behavior; support of student interaction; community building activities; rubrics for assignments; effective use of technology to further engagement/learning; avenue for contact with instructor; availability of student supports; aligned assessments; intuitive navigation. When surveying a group of instructional designers, Baldwin and Ching found that the majority believed the preceding list to be aligned with effective course design and could serve as a standard of baseline performance for online courses.

Franklin (2017) similarly agreed that deliberate design of online courses according to instructional systems design can improve the motivation, volition, and performance of students. Franklin further noted four obstacles, which online courses must overcome, to effectively achieve course outcomes: wasted time on digression, navigational errors, cognitive overload, and lack of community. It could thus be determined from Baldwin and Ching as well as Franklin's studies that online courses must have clearly designed interfaces, which allow easy access to course material, as well as defined objectives presented in a straightforward manner. Course material and assessments should similarly be aligned to these objectives. Furthermore, online courses must provide an avenue for community engagement between students and methods for communicating with faculty as necessary. Ralston-Berg and Braatz (2021) suggested that design standards could help improve industry-wide quality of online courses, which would in turn improve the image of the online delivery method in a time when it is being implemented out of necessity. They elaborated that a series of specific questions are key to assessing online course design:

Does the way the online course is structured help the learner focus on the content? Is the information presented in a way that is easily accessible to all learners? Are there distracting variations in how the content is displayed? Are learners noticing the

information in the order you intended? Would a learner feel confident in knowing how to move forward through the course based on the flow of your course design? (Ralston-Berg & Braatz, 2021, p. 17)

These questions again emphasize the importance of a clean, accessible interface in online courses. Ralston-Berg and Braatz additionally stressed the importance of removing distractions which could hijack learner attention. The goal should thus be not to pack in the maximum amount of content into online courses, but rather to carefully determine learning outcomes for the course and design the instruction specifically to achieve those goals.

Accessibility for all students is a topic of importance for online courses as well as traditional courses. Moorefield-Lang (2019) examined the application of the Universal Design for Learners (UDL) framework for online courses to improve accessibility. It was noted by the author that accessibility requires both an overall design focus on accommodating all students as well as specific use of technology which can be easily utilized by students with disabilities. This can include utilizing text descriptions of images or multimedia content as well as adding narration where appropriate. Including varying types of multimedia content can also help students with differing academic needs. Moorefield-Lang further noted that many prominent software developers (such as Google and Microsoft) now implement accessibility features in their applications which can be easily utilized if included in online courses.

Self-Efficacy in Online Courses

As mentioned previously, self-efficacy has been linked to success later in life, such as indicated by STEM career or degree selection (discussed in the next section). It should thus be a priority to design online courses in a manner which facilitates the improvement of student self-efficacy, especially pertaining to STEM skills. Lim et al. (2021) found that instructor presence in

online courses is connected to improved student self-efficacy. A study was conducted in which student self-efficacy was compared between groups of undergraduate students in Singapore who participated in online activities with either low instructor interaction or high instructor interaction (signifying social presence and accessibility in the course). It was revealed that students had higher self-efficacy when participating in the high instructor interaction activities. Furthermore, Lim et al. noted that this effect was amplified in unstructured activities when compared with structured activities. This suggests that instructor interaction can help improve student self-efficacy in online courses, especially in more freeform activities without clear direction.

Self-efficacy gained in online courses has also been linked to self-efficacy in other digital academic skills. Tang et al. (2022) investigated how online learning self-efficacy affects student performance proficiency via information-seeking self-efficacy. More simply, the study was designed to examine how self-efficacy regarding online learning affected overall performance by improving student confidence in their ability to find information effectively online. Performance proficiency in this context refers to student mastery of skills and abilities. Tang et al. also found that significant positive correlations existed between student online learning self-efficacy and information-seeking self-efficacy, online learning self-efficacy and performance proficiency, and information-seeking self-efficacy and performance proficiency. This suggests that self-efficacy gained by students in online courses may be transferable to other academic skills pertaining to technology (such as online research) and may similarly have a positive effective on overall student academic performance, especially pertaining to skills and abilities.

Similarly, Xu et al. (2022) observed that self-efficacy is directly related to student ability to use self-regulation during online learning. They conducted a study in which they evaluated what factors affected self-efficacy for self-regulated learning (SESRL) for English as a foreign

language (EFL) students in online settings. A variety of factors found to affect SESRL could be roughly divided into four categories, namely: learner factors (self-discipline and self-adaptation), course factors (positive attitude, available resources), task factors (diversified design, appropriate load), and technology factors (technical knowledge and obstacles). Xu et al. noted that, if possible, instructors should monitor student self-efficacy since self-regulated learning requires students to effectively manage time while learning new content. More support can be given if students are struggling to set their own pace or if coursework is too open-ended and more structure is required as a form of scaffolding. Additionally, Xu et al. recommended that instructors consider using coursework which might be difficult to implement in a traditional classroom, such as multimedia content. This both utilizes the strengths of the online platform as well as provides differentiation for students who would benefit from alternate delivery methods (such as EFL students).

Student self-efficacy in online learning became a matter of large-scale importance during the early days of the pandemic due to the rapid worldwide shift to online learning. Heo et al. (2021) examined what factors affected self-efficacy regarding online learning as well as how self-efficacy affects and is affected by other factors, including technology use, time management, and learning engagement. A survey was conducted in South Korea with undergraduate students who were enrolled in online courses during the spring of 2020. Heo et al. discovered that self-efficacy regarding technology use had a negative impact on learner engagement but a positive effect on how online courses were viewed by students. Self-efficacy regarding time management had a positive effect on both learner engagement and how online courses were viewed by students. Additionally, online learning self-efficacy also had a positive effect on learner engagement. These results could indicate that students being too comfortable with technology

may result in them not paying attention due to feeling that they already understand how to use the platform effectively. Heo et al. noted that overall, however, self-efficacy had a positive effect on academic performance of students in online courses and that steps to improve learner engagement would improve online courses.

Since self-efficacy has been linked with success in online courses, it might be worthwhile for students to participate in brief training before or during their first online course to give them experience and thus improve self-efficacy. Stephen and Rockinson-Szapkiw (2021) examined the effectiveness of a first semester course for online students which promoted online learning self-efficacy, self-regulation, and self-direction. The study was designed in response to the pandemic to improve student online experiences. Students who participated in the training were found by statistical analysis (MANCOVA and ANOVA) to rate themselves significantly higher on an online self-regulated learning questionnaire, which tested for levels of online learning self-efficacy. This supported Stephen and Rockinson-Szapkiw's assertion that online training positively impacts the learning experience of first-time online students. They further noted that self-regulation is a learned social skill and thus opportunity must be given to students to acquire it in social settings before it can be applied. This echoes scaffolding theory in that supports must be utilized for a skill to be effectively learned.

STEM Career Selection

It could be argued that the overarching goal behind STEM education is to increase the frequency of STEM career selection among students. The increasingly technology-driven nature of the global education community suggests that to remain competitive, countries must convince a substantial percentage of their students to pursue STEM careers. Research indicates that early exposure to STEM topics results in greater likelihood of students continuing to careers or degree

programs pertaining to technology. Gulhan and Sahin (2016) noted in a research study that participating in STEM activities in elementary school resulted in increased perception and improved attitude toward STEM topics. This suggests that student retention and interest in STEM topics begins early in life. This would suggest that increasing student exposure to STEM topics in primary education would affect STEM career selection later in life. Gulhan and Sahin further suggested that exposure to technology education is more effective at earlier ages, such as elementary school. Sithole et al. (2017) examined methods of student attraction, persistence, and retention in STEM programs. The authors noted that even when students do select STEM degrees, many end up switching to non-STEM degrees or ultimately drop out without obtaining any academic certification. A variety of factors were identified in the study as related to success in STEM programs, including student course load, academic advising, pedagogy, mathematics proficiency, study habits and engagement, time management skills, and student self-efficacy. These results indicate that self-efficacy is necessary not only for the initial decision to attend college but for the academic stamina to see degree programs through to completion. Echoing this sentiment, McDonald and Siegall (1992) noted that technological self-efficacy was linked to improved job performance and positivity. Lamb et al. (2018) sought to determine what psychosocial factors affect STEM career selection in students via quantitative analysis of student profiles. The factors noted by the authors included self-efficacy and interest in STEM topics, spatial visualization ability (i.e., being able to visualize movement in three-dimensional space), as well as a framework of skills defined as 21st century skills, including critical thinking, memory recall/production, creativity, and problem solving. Out of these, the framework of 21st century skills had the strongest effect on improving likelihood of STEM career selection (though all factors affected it significantly). The authors further noted that the use of serious educational

games (SEGs) helped improve the factors mentioned previously. An SEG is defined as an interactive three-dimensional environment in which students complete pedagogical activities focused on improving academic skills related to STEM topics. As SEGs are a form of virtual learning, it could be stated that virtual learning can potentially improve STEM career selection in students if implemented properly.

Sahin et al. (2019) noted that a variety of environmental factors affect student decision to enroll in STEM undergraduate degree programs. Students from lower socioeconomic backgrounds often lack the societal supports necessary to foster interest in STEM programs, as well as the opportunity to do so. Students from underrepresented minority populations as well as female students are similarly less likely to pursue STEM degrees, despite an increased emphasis on programs to increase the accessibility of STEM degrees to these students. Sahin et al. further elaborated that some specific environmental factors affecting the decision to pursue STEM programs are prior classroom experiences and career aspirations, as well as the influence of parents, teachers, and peers. These influences are especially strong for middle school students, as their interests and identities are still largely being shaped. Maltese and Cooper (2017) noted that social influences may affect students differently based on gender. While self-interest alone increased STEM career interest in male students, female students utilized external social supports (i.e., parents, teachers, etc.) to improve STEM career interest. This suggests that the traditionally strong parental involvement of homeschool parents could be beneficial in increasing interest in STEM careers for homeschool students, especially female students.

Murphy et al. (2019) noted that in recent years there has been increased international emphasis on STEM engagement among students, as well as ways to increase said engagement. As discussed previously in the Maltese and Cooper (2017) study, effective engagement methods

vary based on student gender. Murphy et al. noted that self-efficacy, perceived task value, and self-concept are directly related to STEM engagement as well as performance and career aspirations. Notably, the review found that female students tended to have lower self-concept regarding STEM topics and also were more likely to blame failure on personal lack of ability rather than difficulty of the topic. Murphy et al. defined self-concept as referring to a generalized belief about personal ability in a topic, while self-efficacy refers to personal ability to complete a specific task. This suggests that the likelihood of female students pursuing STEM careers or degree programs is strongly affected by their own views regarding their STEM competence (i.e., self-efficacy and self-concept).

Summary

Homeschooling has been rising in popularity since the 1970s and the COVID-19 pandemic rapidly accelerated this growth (Hamlin, 2020). The families who choose to homeschool are an increasingly diverse demographic with a wide variety of goals and motivations for homeschooling (Dennison et al., 2020). Curriculum selection results from the values and beliefs of homeschool families, who view homeschooling as a preferable method of school selection. Online education is utilized by some homeschool parents as a method of improving college and career readiness in their children. Due to the varied methods employed by homeschool families, student technological self-efficacy could be expected to differ from students in public or private schools. The lived experiences of homeschool parents regarding the use of online education as curriculum can be viewed through the lens of self-efficacy and scaffolding theories. Effective online education requires the use of scaffolding or other optimized educational techniques. If correctly utilized, online education may be a viable method of increasing college or STEM career selection in homeschool students. An overview of virtual

learning in online courses and effective online course design provides vital data regarding the proper construction and facilitation of such courses. By understanding both the motivation of homeschool parents in selecting online courses and elements of effective online course design, the experiences of homeschool parents can be better understood and contextualized (Neuman & Guterman, 2017).

CHAPTER THREE: METHODS

Overview

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. A transcendental phenomenological research methodology was utilized, since it seeks to determine the lived experiences of the participants without being influenced by the researcher's views and beliefs (Moustakas, 1994). A brief overview is given of the setting and participants, as well as the study's philosophical assumptions. Data collection was accomplished through individual interviews, focus groups, and journal prompts. Data analysis utilized Moustakas' process to include horizontalization, clustering into themes, and synthesis of essences. This chapter also addresses trustworthiness and ethical considerations of the study. A summary concludes the chapter.

Research Design

This study utilized a qualitative research method. Additionally, it followed a phenomenological design. More specifically, a transcendental phenomenology approach was used due to my prior experience with the topic (homeschooling).

Qualitative Research Method

Qualitative research focuses on the contextual details of data and utilizes collection methods such as interviews (Creswell & Poth, 2018). Data collection in qualitative research is narrow in scope but rich in detail and seeks a deeper understanding of a specific topic rather than a survey of a broad topic. A qualitative research method was chosen for this study because the phenomenon being examined is related to a distinct subset of learners but significantly affected by experiential and cultural factors. Qualitative research emphasizes gathering contextual details

regarding the lived experiences of the participants, making it a reasonable choice for this study. Additionally, qualitative research naturally accommodates interview-based data collection methods (Moustakas, 1994). As this research study focused on examining the lived experiences of homeschool families via interviews, a qualitative methodology made the most sense.

Phenomenological Research Design

Moustakas is considered to be a pioneer of transcendental phenomenology. Though transcendental phenomenology is typically considered to have been developed by Edmund Husserl (1931), Moustakas developed a strong conceptual framework which established the research methodology as it exists today. A phenomenology typically seeks to study research from the perspective of consciousness, experience, and the nature of being (Creswell & Poth, 2018). As the name implies, this research design is best suited for investigating phenomena, especially regarding human perception. Phenomenologies are thus uniquely suited to examine both real objects/events as well as individual human experiences. From this distinction flows the concept of intentionality, which refers to the way that objects and acts of consciousness are connected. Similarly, acts are considered objectifying while feelings are considered non-objectifying. Moustakas (1994) utilized the terms “noema” and “noesis” to refer to phenomena and the perception of phenomena respectively. These terms are used in phenomenologies to describe how people respond to events in their lives. Intuition is also considered to be a foundational concept of phenomenology. It refers to the ability of mankind to effectively make judgements based off past experiences and sensory input. Intuition thus affects how people perceive phenomena.

Transcendental Phenomenology Approach

A transcendental phenomenological approach was chosen due to its alignment with the research study. A transcendental phenomenology requires researchers to identify their own experiences and views, and then isolate them from the research process to preserve objectivity (Moustakas, 1994). This requires introspection on behalf of the researcher to identify personal biases and conduct objective research despite them. A transcendental phenomenological methodology was specifically chosen for this study because, while I have personal history with the homeschool movement, any personal views are not integral to the design of the study and I reported them in a researcher's reflexive journal (see Appendix J).

Research Questions

The following research questions guided the study and utilized Bandura's (1986) and Ninio and Bruner's (1978) theories of self-efficacy and scaffolding, respectively. The existing body of research informed the questions. The research questions sought to examine the problem of lack of self-efficacy in homeschool students affecting college or career readiness.

Central Research Question

How do homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of preparation for college or careers in STEM fields?

Sub-Question One

How do online courses provide homeschool students with performance accomplishments that increase self-efficacy as well as STEM career selection?

Sub-Question Two

How does participation in online courses affect college/career readiness via academic persistence in homeschool students, especially regarding STEM topics?

Sub-Question Three

How does participation in online courses affect the ability of homeschool students to develop higher order skills from component skills?

Setting and Participants

The research setting and participant demographic information are detailed in the following sections. Clearly establishing these characteristics allowed the study to be tightly focused on the phenomenon in question as well as increase the efficiency of the procedures (Creswell & Poth, 2018). Though some flexibility exists in both categories, adherence to these guidelines will allow future replication of the study as necessary.

Setting

This study was conducted in North Dakota and focused exclusively on homeschool families who reside within the state. Though geographically convenient to me as the researcher, North Dakota is noteworthy to the study in that it is typically considered to have some of the most restrictive homeschooling laws in the nation (U.S. Department of Education, 2019). Despite this, it has a thriving homeschool community (relative to its low population density) that provides a useful representation of homeschooling in the United States as a whole. Over 5,000 students were homeschooled in North Dakota during the 2020–2021 school year (Ray, 2021). The study defined homeschooling as education occurring at home with the parent(s) as both the primary teacher and curriculum director. Thus, it is distinct from public or private school instruction occurring at home (such as became commonplace during the COVID-19 pandemic). Although there is no central leadership in the sense of a school district, homeschool families do organize into loose communities for social learning opportunities and general fellowship.

Participants

Moustakas (1994) noted that the lived experiences of participants are to be the focus of transcendental phenomenological research. As such, careful participant selection is vital to producing viable data and valid research conclusions. Since qualitative research utilizes a relatively small sample size, the importance of properly selecting participants is amplified (Creswell & Poth, 2018).

The participants in this study were homeschool parents who live within the state of North Dakota and who utilized at least one online course in the curriculum of their children. Parents were not eligible if their children attend a public or private school full time but complete coursework remotely. More specifically, the parent(s) must have filed a statement of intent to homeschool with the state (North Dakota) and thus be recognized by the state as a homeschooling family (Homeschool Legal Defense Association, 2020). Additionally, only the primary homeschool parent of a husband/wife combination were allowed to participate in the study to prevent skewing the results since the sample size was quite small. The study included 12 participants as this is defined as an adequate sample size for a transcendental phenomenology (Moustakas, 1994). The definition of “online course” for the study was quite loose and included synchronous courses facilitated by a teacher to asynchronous or even self-paced units. Beyond those mentioned above, the study had no restrictions on who could participate in the study.

Researcher Positionality

The following sections articulate the interpretive framework utilized by this study, as well as the three philosophical assumptions. These assumptions (ontological, epistemological, and axiological) are considered in light of the transcendental phenomenological methodology being used by the study. My role as the researcher is also examined.

Interpretive Framework

This research study utilized social constructivism as an interpretive framework. Social constructivism focuses on the subjective meanings of experiences with emphasis on the complexity of individual views (Creswell & Poth, 2018). I examined the personal experiences of participants to formulate these subjective meanings. Additionally, I utilized a social constructivist framework with open-ended interview questions to allow participants to construct their own meaning via dialogue. Prior to data collection I specified my own experiences and worldview via a process called *epoché* (Moustakas, 1994). *Epoché* allowed me to definitively acknowledge the influences which shape this research study.

Philosophical Assumptions

To philosophically position the research study, three assumptions are discussed below. These include ontological, epistemological, and axiological assumptions. Moustakas (1994) asserted that researcher bias must be identified and set aside in transcendental phenomenological methodology. It is thus necessary to establish what worldview and general philosophical assumptions are used by the study to give it context and provide an appropriate interpretive framework (Ahmed, 2008).

Ontological Assumption

According to Guba and Lincoln (1989), an ontological assumption examines “what kind of world we are investigating, with the nature of existence, with the structure of reality as such” (p. 83). My belief is that one reality exists, and that humanity can interact with it directly. This reality can be observed at least in part with the physical senses and discovered by reason and divine insight (Wippel, 1989). I believe that absolute truth exists and was established by a Creator. Morality is not determined by the individual but by principles established by God before

the creation of the Earth (*King James Bible*, 1769/2017, John 1:1–3). Education should seek to better understand the nature of God by examining His created universe and His children who inhabit it (*King James Bible*, 1769/2017, 2 Timothy 2:15).

Epistemological Assumption

Maynard (1994) describes epistemology as “concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate” (p. 10). This study worked on the assumption that while reality itself is objective, individual experiences of it are subjective and provide useful context to better understand various phenomena. The transcendental phenomenological stance is that the lived experiences of participants can be examined to determine recurring themes which result in cultural essences (Moustakas, 1994). The myriad subjective experiences of individuals can thus be examined, categorized, and simplified into objective observations on a phenomenon.

Axiological Assumption

An axiological assumption refers to an interpretation of events via worldview by an author which shapes a narrative (Denzin, 1989). I hold to the Judeo-Christian worldview that God created the universe (including mankind) and designated moral absolutes. Additionally, the family is the foundation of society and was established by God as one man and one woman joined together in marriage. Furthermore, homeschooling is a valuable method of education as it emphasizes the role of family and empowers parents to take responsibility for the education of their children. My view of homeschooling was shaped by my own lived experiences as a homeschool student. This research study utilized a transcendental phenomenological methodology, meaning that I set aside my personal experiences and beliefs to objectively analyze the collected data (Moustakas, 1994).

Researcher's Role

My role as researcher in this transcendental phenomenology was to examine the lived experiences of homeschool parents who utilize online courses as scaffolding to improve self-efficacy in their children. I had no authority over any participants, and participation was purely voluntary. Rather, my primary concern was accurately recording the lived experiences of the participants and carefully analyzing the data to ultimately determine valid cultural essences. My Christian worldview and relationship with Jesus Christ guided my research, as did my belief that family is the foundation of society. Furthermore, I believe that homeschooling offers a viable method for strengthening families and equipping children for the challenges of the future.

Procedures

The following sections examine the process of gaining Institutional Review Board (IRB) permissions through Liberty University. Additionally, the recruitment process is outlined. A brief overview is given of the sampling methods utilized by the study.

Permissions

IRB permission as per Liberty University's guidelines was sought prior to beginning a pilot study, followed by the recruitment of participants noted below. A detailed description of the proposed study and methodology were submitted to IRB. Once an approval letter was obtained, I conducted a small pilot study. The pilot study included the first three participants of the actual study. In the pilot study, I utilized the individual interview questions used in the actual study to improve my ability to gather data as well as to test the alignment of the gathered data to the study's research questions. Once the pilot study was concluded and any necessary changes to the methodology were made, I continued to recruit participants until I had the necessary 12 participants for an adequate sample size.

Recruitment Plan

Requests for participants were placed in homeschool email newsletters several times across the state, in hopes of getting participants from around the state and simply to increase the odds of gathering a substantial enough sample. The recruitment flier used as a request for participants is included in Appendix B. A variety of homeschool organizations exist in North Dakota (learning co-ops to religious groups to athletic organizations) so it seemed possible that enough participants could be gathered in this manner. Initial fliers were posted in homeschool newsletters when the study began, and again a month later as more participants were needed. An ad was also placed on social media. Individuals who were interested in participating in the study could respond to the email address which was listed on the flier. These individuals were then emailed a recruitment letter (included in Appendix C) which included a hyperlink to a screening survey (included in Appendix D). I only asked questions on the screening survey that would ensure I could select individuals who would meet the participant criteria. The screening survey was presented in Google Forms, as it was easily accessible to me for review. Individuals were then sent either acceptance or rejection emails depending on their suitability for the study (included in Appendix E). The acceptance emails also included a hyperlink to the consent form (included in Appendix F). Data collection began once a signed consent form was returned.

Data Collection Plan

Three data collection approaches were selected for this study: individual interviews, focus groups, and journal prompts. Individual interviews allowed for accurate data capture regarding the phenomenon by directly recording participant lived experiences for later evaluation. Focus groups were used to elicit greater dialogue on the phenomenon by giving participants the opportunity to compare their individual experiences. Finally, journal prompts

provided another avenue for examining participant lived experiences and provided details the participant was uncomfortable mentioning during the interview. Interviews were the primary source of data and thus came first. The focus groups were next and allowed for greater detail to be gathered, allowing me to ask for clarification regarding ideas that were brought up in individual interviews. The third data collection method, journal prompts, served as a coda to the interviews and focus groups and built upon the initial interview and focus group questions. The actual study itself (in the form of interviews) took place via video conference. Since the participant interviews were conducted via video conference, there was no geographical restriction (other than being in North Dakota). Purposeful sampling was used, as only one parent per family was selected (i.e., if a mother participated, the father did not). Purposeful sampling was preferable to convenience sampling for this study because participants were required to have specific attributes to be viable (Creswell & Poth, 2018). Snowball sampling was also necessary to secure an appropriate sample size. Parents were required to have used some form of online course in their children's coursework.

Individual Interviews

According to Moustakas (1994), long interviews are a primary method of gathering information about the topic and question of the research study. Beginning the interview with an informal conversation or activity can help relax the participant, allowing for greater openness. A focusing activity can also help set the tone for the overall atmosphere of the interview. The interview questions may benefit from being broad in scope to encourage greater detail and elaboration in response. Before beginning the interview, I mentally distanced myself from my own experiences regarding the topic and kept track of my biases in the researcher's reflexive journal (included in Appendix J). This is known as the principle of *epoché*. Interviews are

considered a suitable method of data collection for phenomenological studies since they give insight into participant perception of the phenomenon in question (Moustakas, 1994), as well as how the object and perception of the object interact in the human mind.

For this study, participants previously identified were contacted to determine the best method of conducting the interviews. Depending on participant location and/or preference, the individual interviews were conducted either in person or via video conferencing. If conducted in person, a location would have been agreed upon by the participant and researcher (such as a meeting room in a coffee shop, a church, a library, etc.); however, all participants selected video interviews. Individual interviews took 30–60 minutes to conduct. Each interview was audio recorded via computer or smartphone and later transcribed.

Individual Interview Questions

1. What initially led you to homeschool your children? (Central Research Question [CRQ])
2. What led you to implement online courses in your family's curriculum? (CRQ)
3. Please describe how you have implemented online courses into the curriculum of your children. (CRQ)
4. Self-efficacy refers to individual perception of skill level or competence regarding a task or domain. Building self-efficacy typically requires students to overcome challenges (performance accomplishments) to improve their sense of competence. In what ways do you see your children's self-efficacy being enhanced by their participation in online courses? Please list specific courses and examples of your children's self-efficacy. (Sub-Question [SQ] 1)
5. Academic persistence refers to the ability to complete an academic course or degree despite encountering difficulties along the way. Increased academic persistence has been

linked to self-efficacy. In what ways do you see your children's academic persistence (i.e., ability to work through difficulties) being enhanced by their participation in online courses? Please list specific courses and examples of your children's academic persistence. (SQ2)

6. STEM refers to science, technology, engineering, and mathematics. In what ways do you believe participation in online courses has affected the ability of your children to succeed in STEM degree programs or careers, should they choose to do so? Please list specific courses and examples of your children's attitude toward STEM topics. (CRQ, SQ1, SQ2)
7. The educational theory of scaffolding suggests that to develop higher order thinking skills, students must first master basic skills and successfully combine them to develop advanced skills. An example of this would be that before successfully solving an algebra problem, a student must first master basic mathematics concepts such addition/subtraction, decimals, and order of operations. In what ways do you think online courses are able to provide opportunities for students to develop higher order thinking skills? Please list specific courses and examples of your children displaying higher order thinking skills. (SQ3)
8. In thinking about your children's college/career readiness, how have online courses prepared your children? (CRQ, SQ2)
9. Do you believe the benefits (if any) of online courses were due to the online format, or simply because of the course content? Why? (CRQ)
10. What skills do you believe are important for persistence in college or careers? Do you believe online courses are able to adequately prepare students to use these skills? (SQ2, SQ3)

11. How has the use of online courses affected the self-efficacy of your children regarding the use of technology in an educational setting? In this context how would online courses affect the college readiness of your children? (SQ1, SQ3)
12. The use of online courses could be considered scaffolding since they provide an educational aid to students which will eventually be removed once they master the content. In what ways do you think online courses have helped your children master a concept? Please list specific courses and examples of mastery. (CRQ, SQ3)
13. Some STEM topics (such as laboratory science courses) are typically considered more difficult to present authentically in an online format due to the challenge of skill acquisition. In what ways (if any) have online courses helped your children develop educational skills? (SQ1, SQ2)
14. What are some weaknesses of online courses that have potentially hindered your children's self-efficacy? Please list specific courses and examples. (CRQ)
15. What improvements do you expect will be implemented in online courses in the future to better prepare students for college and careers? (CRQ)

Questions 1 through 3 gathered contextual information on the participant's use of online education and overall motivation for homeschooling. Question 4 investigated the presence of performance accomplishments in online courses. Question 5 examined participant perception of the effect of online courses on academic persistence. Question 6 introduced STEM topics and the effect of online courses on career/college readiness. Question 7 introduced the concept of scaffolding and investigated the effect of online courses on skill building. Question 8 acted as a grand tour question (Marshall & Rossman, 2015) and refocused the interview back on the ability of online courses to prepare homeschool students for college or careers. Question 9 investigated

participant perception of the online platform itself. Question 10 combined the overall investigation into college/career readiness with scaffolding theory's focus on skill acquisition. Question 11 asked about a variation of self-efficacy: technological self-efficacy. Questions 12 and 13 examined skill acquisition via the online platform, especially regarding STEM topics. Questions 14 and 15 investigated potential weaknesses of the online platform and how they might be addressed in the future.

Individual Interview Data Analysis Plan

After all interviews were completed, I transcribed each interview myself. Completed interview transcripts were emailed back to the respective participant for review (a process known as member checking). After receiving approval from all participants, I conducted horizontalization by noting key words and phrases in each interview transcript (Moustakas, 1994) then comparing them with each other for commonality to determine the preliminary codes. Moustakas (1994) described this process as giving equal weight to the statements of all participants. Additionally, Saldaña (2021) describes codes as symbolic words or phrases which assign attributes to language or visual data. Repetitive or redundant codes were removed at that time, leaving only the preliminary codes for the interview data.

Focus Groups

Focus groups can be a useful follow-up method of data collection when employed after individual interviews. Often focus groups are able to bring out different information than individual interviews due to participant exposure to different viewpoints and increased potential for dialogue (Creswell & Poth, 2018). Facilitation of focus groups can occur in a variety of ways. They may be conducted in person or via technology and may be conducted synchronously or asynchronously. I conducted the focus groups for this study as 1-hour virtual meetings which

occurred after all individual interviews were completed. Multiple focus groups were conducted to better facilitate the participation of all interview participants. A virtual setting was selected due to the greater convenience and increased likelihood of participants being able to attend. Participants were welcomed and properly instructed on how to use any required technology before the focus group began so it could proceed smoothly.

Focus Group Questions

1. What are some benefits of online courses that you have noticed while homeschooling your children? (CRQ)
2. What are some challenges to online courses that you have experienced while homeschooling your children? (CRQ)
3. In what ways are online courses able or unable to provide suitable challenge to improve student self-efficacy? (SQ1)
4. What effect (if any) have online courses had on the academic persistence of your children? (SQ2)
5. How is the online platform suitable or unsuitable for development of higher order thinking skills? (SQ3)
6. In what ways have online courses affected the college/career readiness of your children? (CRQ)
7. How do you think the use of online courses has affected the ability of your children to succeed in STEM degree programs or careers? (SQ1, SQ2)
8. In what ways have online courses provided opportunities for your children to master content? (CRQ, SQ3)
9. In what ways have online courses affected the self-efficacy of your children regarding

technology in an educational context? (SQ1, SQ3)

10. In what ways have online courses provided support for your children regarding the development of skills (such as research skills)? (CRQ, SQ3)

Questions 1 and 2 should have been easy to answer and set a conversational tone for the focus group. Question 3 investigated performance accomplishments and introduced the topic of self-efficacy. Question 4 continued to investigate self-efficacy and discuss persistence. Question 5 introduced scaffolding and the effect of online courses on skill building. Question 6 brought conversation back to the main research question. Question 7 investigated the use of online courses as preparation for STEM degree programs and careers. Question 8 examined the ways in which online courses provide opportunities for skill mastery. Question 9 investigated the use of online courses to increase technological self-efficacy. Question 10 again asked the participant if online courses provide support in building skills.

Focus Group Data Analysis Plan

As with individual interviews, I transcribed recorded data from the focus groups and emailed the transcript to each participant to undergo member checking. Once the participants approved the transcript, I utilized horizontalization to identify key concepts and eliminate unusable data (Moustakas, 1994). These key concepts were given equal weight and compared to establish preliminary codes.

Journal Prompts

Moustakas (1994) stated that questions arise when describing experiences, specifically what the nature of a phenomenon is, what its qualities are, and how it varies by time and condition. Some participants may have preferred describing the phenomenon in a series of journal prompts, which allows greater processing time and lower performance anxiety. As such,

it was beneficial to include journal prompts as a means of data gathering after conducting the focus groups. Proper wording of questions is vital in journal prompts if useful data are to be obtained. Whereas a researcher can rephrase a question during an interview if the participant misunderstands it, a journal prompt has one chance to gather valid data and thus must be designed intentionally with care.

A series of journal prompts were used as a follow-up activity to the focus groups. The journal prompts did not directly overlap with the individual interview or focus group questions but rather elaborated on them and dug for more information since the participant had additional processing time. Additionally, several of the questions asked participants about future events relating to the research topic. This emphasized the connection between participant perception (noesis) and the phenomenon (noema). The journal prompts also queried participants more directly about some topics which the interview questions skirted around (such as technological self-efficacy). They were sent as a set to participants via email after the focus groups. Participants were instructed to answer each prompt in one or two paragraphs. All communication regarding the journal prompts was conducted via email. The study allowed 2 weeks for the prompts to be completed. A follow-up email was sent if prompts had not been returned.

Journal Prompt Questions

1. Self-efficacy refers to individual perception of skill level or competence regarding a task or domain. How would you compare the importance of self-efficacy to actual skills regarding success later in life?
2. Research has suggested that academic persistence (sticking it out to finish a difficult course or degree program) is related to student self-efficacy level. Why do you think this might be? What effect have online courses had on the academic persistence of your

children?

3. It has been suggested that self-efficacy in students is improved by overcoming obstacles which appear challenging but are moderate in difficulty. In what ways have online courses been able to adequately provide such challenges for your children? Please list specific courses and examples.
4. The development of higher order thinking skills (necessary for college/career success) has been suggested to result from combining basic skills in a structured environment. In what ways have online courses been able to provide a viable environment for your children to practice developing these higher order thinking skills? Please list specific courses and examples.
5. In what ways have online courses been effective at preparing your children for college or careers? Please list specific courses and examples.

Question 1 investigated participant perceived value of self-efficacy to provide context to participant lived experiences. Question 2 connected self-efficacy directly to academic persistence and investigated the effect of online courses on both. Question 3 again investigated the use of performance accomplishments in online courses. Question 4 further investigated scaffolding as a means of improving skills. Question 5 provided a final opportunity for participants to elaborate on lived experiences regarding the use of online courses as a means of improving college/career readiness.

Journal Prompts Data Analysis Plan

Since participants sent me their journal prompts directly to me, member checking had already occurred when I received their data. I then manually examined the journals and used horizontalization of data to identify keywords or phrases which appeared throughout the

responses of different participants (Moustakas, 1994). Keywords and phrases determined during horizontalization served as preliminary codes.

Data Synthesis

According to Husserl (1931), data synthesis is “the intuitive integration of fundamental textural and structural descriptions into a unified statement of the essences of the experience of the phenomenon as a whole” (p. 44). Synthesis should thus utilize the keywords or codes from each method of data collection equally to establish these experiential essences. The first step of this process is known as phenomenological reduction (Moustakas, 1994). Phenomenological reduction seeks to describe a phenomenon in basic, experiential terms. Creating accurate descriptions of the phenomenon requires multiple readings to fully discern participant lived experiences. Once basic descriptions of an object are recorded, the contextual experiences of participants must be described, which is often more challenging (Moustakas, 1994).

Phenomenological reduction has four stages which I utilized to analyze the data. In bracketing, I set aside all objects which were not the focus of research. Retained objects were marked with highlighters on physical copies of the data. A color-coding system was used to mark similar objects. In horizontalizing, I assigned all retained objects (called horizons) equal value. I clustered these horizons into themes using the color-coding highlighter system. Finally, I developed these themes into descriptive text.

Following phenomenological reduction, the next step of data synthesis was imaginative variation. Imaginative variation used the textural description previously established as a springboard to brainstorm possible meanings and contexts. Whereas phenomenological reduction sought to isolate the most concrete elements of a phenomenon, imaginative variation conversely sought to examine all possibilities regarding it. This was primarily accomplished through

reflection. To accomplish this, I first methodically examined different possible meanings of the determined themes. A highlighter/color-coding system was again used to identify related themes. Next, I sought to determine what underlying contexts were related to the manifestation of the phenomenon. The phenomenon was examined using the lens of universal structures such as physical context and time. Finally, I sought to establish structural themes of the phenomenon to better describe it (Moustakas, 1994).

The last step of data synthesis which was used is synthesis of meanings and essences. This step essentially combined the textural descriptions of the phenomenon from phenomenological reduction with the structural descriptions of the phenomenon from imaginative variation. These combined descriptions are known as essences (Moustakas, 1994). Moustakas (1994) cautioned that essences derived from data analysis are rooted to specific places, times, and researchers and thus should not be considered exhaustive. Keeping these limitations in mind while performing synthesis allowed me to develop accurate essences from the data. A table was included in Chapter 4 which lists the synthesized codes, the developed themes, and resulting subthemes used to determine essences.

Trustworthiness

Lincoln and Guba (1985) defined trustworthiness as credibility, transferability, dependability, and confirmability. Designing a study with these four attributes as goals allows a researcher to demonstrate how academic rigor is achieved via precision and consistency. Precision and consistency are necessary for a study to be duplicated by other researchers. The following sections detail the methods that I used in this study to ensure trustworthiness. Ethical considerations are also addressed as defined by Lincoln and Guba.

Credibility

Credibility can be defined as the accuracy or validity of a study, such that it allows for reader confidence that the results can be trusted (Lincoln & Guba, 1985). Typically, credibility is linked to specific research techniques which can be used to justify faith in the study. This research study utilized three techniques to establish credibility: (a) triangulation, (b) member checks, and (c) prolonged engagement.

Triangulation

Triangulation refers to the process of using multiple sources or methods of data collection (Lincoln & Guba, 1985). If necessary, triangulation can even entail the use of multiple researchers to ensure that the gathered data are trustworthy. This process is also known as cross-checking and requires comprehensive methods of data collection. To achieve triangulation, this study utilized individual interviews, focus groups, and journal prompts to gather data. These data collection methods were chosen specifically to achieve triangulation, as each utilizes a significantly different method of data collection. Additionally, each theme and subtheme, developed in Chapter 4, utilized participants' comments and/or quotations recorded during different methods of data collection to provide evidence of triangulation.

Member Checks

The primary purpose of member checks as a credibility tool is to provide transparency to study participants regarding their data and how the data are recorded (Lincoln & Guba, 1985). Member checking refers to the process of returning gathered data to participants for review to ensure accuracy and transparency (Birt et al., 2016). Participants in this study were given access to all transcripts regarding their responses during individual interviews and their part of the focus group conversation. After completing each form of data collection, this information was

provided proactively to each participant via emailed transcripts. Participants were asked to review their transcripts, confirm their accuracy, or edit them if necessary. A second email request was sent if a participant did not respond in a timely manner. Member checking of transcripts ensures accuracy and transparency, as well as improving trust between participant and researcher (Creswell & Poth, 2018).

Prolonged Engagement

Prolonged engagement refers to the researcher achieving a satisfactory amount of observation and interaction with the phenomenon in question. Lincoln and Guba (1985) stated that this lengthy contact is necessary to determine if distortion of data has occurred and to identify important occurrences during data collection. To achieve prolonged engagement in this study, I interacted with participants a minimum of three times over an extended period of time via individual interviews, focus groups, and journal prompts.

Transferability

Transferability refers to how easily data from a study can be applied to different settings or research studies. The best way to achieve transferability is to include rich descriptive data and an audit trail (Lincoln & Guba, 1985). Constructing a well-developed literature review prior to the study can help readers connect the results to other fields, but ultimately thorough documentation of data is the best method of achieving transferability as it allows subsequent researchers to make connections themselves. To be transferable, research results must utilize rigorous methodology, provide adequate detail regarding results, and meet standards of trustworthiness (Creswell & Poth, 2018).

Rich Descriptions

Lincoln and Guba (1985) cautioned that rich descriptive data are necessary to achieve proper transferability because such data provide subsequent researchers with context for interpreting findings. The exact amount of detail necessary varies situationally, but research studies must provide sufficient context for others to determine similarity between the findings of other studies. A strong narrative throughout this dissertation helped provide these rich descriptions.

Audit Trail

An audit trail is used to show the exact research methodology used and to detail the process of data collection, both for participants and future researchers (Kleijn & Van Leeuwen, 2018). This provides an important level of transparency to the study by reducing confusion regarding research protocols. In addition to increasing participant trust in the study's professionalism, an audit trail is helpful to other researchers who wish to replicate the study in the future. If research methodology (especially regarding data collection) is recorded thoroughly, there will be less guesswork required by future studies. Additionally, an audit trail helps document that the study was conducted with safety and propriety by providing detailed descriptions of methodology. I placed an audit trail in Appendix K.

Dependability

Dependability can be assessed via an inquiry audit. An inquiry audit is a method of determining dependability in which the research study is reviewed and the processes are assessed (Lincoln & Guba, 1985). The methods of data collection and data analysis are especially scrutinized to determine if any researcher error or bias is present. The inquiry audit was completed by my dissertation committee.

Confirmability

Confirmability refers to a study being free of personal bias pertaining to the researcher. This is especially vital in transcendental phenomenological studies as the methodology requires researchers to identify and set aside personal experiences and beliefs to maintain data integrity (Moustakas, 1994). Typically, confirmability is addressed by utilizing a series of techniques which confer impartiality (some of which overlap with the techniques used to document credibility). Two such methods include clearly defining the motivation of the researcher, as well as maintaining a reflexive research journal.

Researcher Motivation

My motivation for undertaking this research study was to determine how online courses can be improved to better meet the needs of homeschool families. As a former homeschool student and current homeschool parent, it is important to me that homeschool families have viable options for online courses which equip students with skills necessary to succeed in college or careers later in life. This research study was designed to investigate how online courses affect the self-efficacy of homeschool students, which in turn affects college and career readiness.

Researcher's Reflexive Journal

Keeping a thorough researcher's reflexive journal (Appendix J) helped provide confirmability by giving context to each of my biases. Moustakas (1994) describes this process of identifying personal biases as *epoché*. Additionally, it can serve as another method of establishing a narrative from which to base descriptive data in the research study (Lincoln & Guba, 1985).

Ethical Considerations

The study was initially examined by Liberty University's IRB before data collection to ensure the methodology was ethically sound. Participants signed a consent form before the study began, detailing any risks associated with the study. Participation in the study was completely voluntary, and participant confidentiality was a top priority. I ensured confidentiality by assigning pseudonyms to all participants so that they cannot be easily identified by readers. When the study was complete, the results were shared with all participants. Establishing safe settings and propriety is a top priority. Interview recordings and transcripts were kept safe on a password-protected computer to respect the privacy of the participants (Creswell & Poth, 2018). This privacy extends beyond the duration of the study for 3 years, at which point data will be destroyed if no longer in use.

Summary

This qualitative study used a transcendental phenomenological methodology as it sought to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college and career preparation. To that end, individual interviews, focus groups, and journal prompts were used to collect data. They were chosen due to their suitability to both the available research setting and participants. Data analysis was conducted via horizontalization to develop the preliminary codes. Next, these preliminary codes from each data set were synthesized to develop the final themes. Following this, the final themes were clustered into the themes and subthemes from which the synthesis of the essences emerged. Trustworthiness was established through criteria relating to credibility, transferability, dependability, and confirmability. Finally, a variety of necessary ethical considerations was addressed.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. Participants recruited for the study were parents who had utilized online courses as curriculum while homeschooling their children in North Dakota. Each participant was given a pseudonym. The data presented in this chapter were gathered via individual interviews, focus groups, and journal prompts. All of the participants' quotes given in this manuscript, including grammatical errors in speech and/or writing, are presented verbatim to accurately depict their voices. A brief background of each homeschool parent in the study is given to add context to their statements. Next, the five themes and 16 subthemes which emerged from the data are discussed. Finally, the research questions are answered using the developed themes and a short summary concludes the chapter.

Participants

The participants were recruited according to three criteria: the participant was the primary homeschooling parent of at least one child, the participant was living in North Dakota, and the participant utilized at least one online course as curriculum for her/his children. Pseudonyms were randomly given to all participants. Table 1 provides basic information about each participant. Brief descriptions of each participant have been included after the table.

Table 1*Parent Participants*

Participant Name	Participant Gender	Online Courses Used
Amy	Female	Latin, Science, Religious
Ashley	Female	Math, History, Spelling
Hannah	Female	Math, English, History, Bible, Crafts
Heather	Female	Math, Psychology
Kaitlyn	Female	Science, Math, Spanish, Typing, English
Jessica	Female	Science, Literature, Various
Madeline	Female	Latin, History, Composition
Mariah	Female	Science, Music, Programming, Writing
Megan	Female	Science, Philosophy, Various
Michelle	Female	Science, English, Language, Civics
Sarah	Female	Educational Therapy, Finance
Tom	Male	Civics/History

Amy

Amy moved to North Dakota within the last 5 years after her husband accepted a call to ministry. Both were humanities majors in college, and Amy feels that homeschooling is a good way to give their children “the best education and to incorporate religion into it.” She has utilized a wide range of online courses to provide religious and classic education. Amy felt comfortable teaching her children beginner and intermediate Latin but looked for courses online once their skills grew advanced. When one of her children showed a gift for math and science, she found online courses to help meet this need, since she lacked advanced training in this area. Amy noted

that she and her husband were trying to not directly influence their children for or against college. In Amy's journal prompts she noted,

I want to state that we purposefully tried to not be pragmatists in our approach to education ... instead, we think education should prepare them for the life vocations they will have, such as child of God, spouse, parent, sibling, as well as employee.

Ashley

Ashley was homeschooled by her mother, a former inner-city schoolteacher. Her positive experience with the format led her and husband to homeschool their own children. In Ashley's individual interview she mentioned, "It's been very beneficial to our family, and we have a very close family as a result." Both her children are in elementary school, but Ashley is excited about the potential of online learning early in life. In a focus group, Ashley shared, "As a mom teaching my kids, I'm really glad to have that help, and have that resource, somebody else to teach them a little bit and make sure they're prepared." She stated that the multimedia capability of online learning to tap into different learning styles has helped her children master difficult concepts at an early age.

Hannah

Hannah and her husband initially put their children in private school, which was a positive experience. A desire to spend more time together as a family, however, led them to homeschooling. In her individual interview, Hannah remarked, "And like a week before school, I really felt the Lord was just like, 'No, now you just got to do it.' And so, we jumped into it and then we haven't looked back." Initially using a single curriculum, Hannah eventually switched to using a variety of courses, including some online courses. She felt that the wide variety of subjects available online via courses and tutorials make it an excellent resource when her

daughter is interested in topics she is unfamiliar with. In a focus group, she stated, “She loves to do craft-type stuff, she loves to do calligraphy. And honestly, that is not my forte. And so, she’s been able to use them. It’s not necessarily just for math and science.”

Heather

Heather was not homeschooled herself, but her husband was and had a positive experience. They initially put their oldest child in private school but switched to homeschooling in lower elementary school out of a desire to spend more time together as a family. Heather has used a variety of dual credit courses to help her daughter get a head start on college credits while at home. The availability of quality math instruction online was also a determining factor in the adoption of online courses. In her journal prompt, Heather noted, “Doing the online courses has definitely helped my daughter progress in her math abilities.”

Jessica

Jessica and her husband chose homeschooling because it helps them focus on family and meshes well with their farming lifestyle. Having a large family even in comparison with other homeschool families, Jessica felt that online courses help provide high-quality education to all her children. In her individual interview, she shared, “Someone was going to lose out, and I couldn’t bear that.” She feels that online courses are a useful tool, but that in-person learning is the example given to us by God. In her individual interview, Jessica remarked,

Jesus, in order to save us had to incarnate into Man, and he had to be there, he had to take on flesh, and use his hands, feet...there’s something about incarnating skills on a human level, there is definitely a difference.

Jessica and her husband enroll each child in online courses that would benefit them individually due to their unique gifts and needs. She cautioned that online courses sometimes do a poor job of meeting specific student needs. In a focus group, she elaborated,

If they really need help or just really don't understand something, it's very difficult because the expectation is when you're paying for an instructor, they [the students] will definitely understand the subject matter, and then when there's not that kind of access, it's frustrating.

Kaitlyn

Kaitlyn and her husband were drawn into homeschooling by a friendship with early pioneers of the homeschool legalization movement in the region. Homeschooling proved to be a natural fit. In her individual interview, Kaitlyn shared her desire to “impart our own Christian values along the way, and not losing them in the herd mentality.” They utilized an assortment of early online and computer resources for their children across a variety of subjects including math, science, Spanish, and typing. While the courses helped solidify content knowledge for her children (especially in math and science), Kaitlyn felt that a primary benefit was in life skills. In her individual interview Kaitlyn noted the value of “learning to be a learner and to keep going, and having confidence that you can.”

Madeline

Madeline and her husband chose homeschooling early on for their children out of concern about the curriculum in the school system, seeking instead to equip them with “family values and morals.” They looked to online courses as a means of college or career preparation via dual credit courses. In general, Madeline was unsatisfied with her family's experience with online courses. In her individual interview she noted,

I expected she'd come out as a better writer and they would teach her a lot of things and help her to see what she was doing wrong. And I felt that didn't happen at all. It was just, in fact, focused more on how the MLA format was or if she was over by four words.

Madeline noted that online courses could be improved by providing comprehensive feedback to individual students. In a focus group, she stated, "I just didn't think we got good feedback that improved what they were learning, which is what I was really looking for. That was disappointing."

Mariah

Faith is a central focus of Mariah and her husband's lives, but it was not initially a factor in their decision to homeschool their children. Rather, they desired for their children to have a connected, interdisciplinary education and felt that homeschooling would present a better avenue for it than public or private school. They value online learning as a means of providing advanced courses to their children as well as a way to earn college credit while still at home. Her children have been able to substantially lower the cost of college degrees by completing generals in high school via online courses. In her individual interview, Mariah shared,

It definitely was a good feeling for her to be able to know that she's got these credits under her belt ... just knowing that she's got some of them out of the way will help her a lot with her scheduling in the future.

Mariah was very positive about her use of online courses as curriculum for her children.

Megan

Megan holds a graduate degree in education. She and her husband decided to homeschool their children after interacting with homeschool families during an internship. In her individual interview, she elaborated, "I fell in love with their families, and I wanted my friends to be like

that. And then I worked in a public school, and I thought I didn't want my kids to feel like that." Megan utilized online dual credit courses as a way for her children to gain exposure to college work and complete generals while still at home. She feels that although online courses have some inherent weaknesses (such as rigidity and communication breakdowns) overall they have helped her children prepare for college.

Michelle

Michelle and her husband initially decided to homeschool their children because they felt that public school would provide an inadequate education. Geographical distance from the nearest school and a long commute also played a role in their decision. Soon realizing that this choice was the right one for their family, they continued to homeschool their children all the way through graduation. Online learning became an attractive option in high school due to the availability of different courses and the potential of earning college credit. Her children have taken several advanced math and science courses online, as some plan to major in STEM fields.

Sarah

Sarah is a certified teacher and the mother of multiple children. Several of her children have unique learning needs, which led her and her husband to seek out educational services via the Internet that were otherwise not available near their home. Sarah does not feel that online classes are necessarily superior to in-person classes, but that access makes them worthwhile. In her individual interview, Sarah noted, "The availability is a huge factor being in rural North Dakota, there's just things we don't have access to that online makes it accessible." The adaptations available via technology have also been beneficial to her children, such as text-to-speech via smart devices and the ability to pause and rewind lessons.

Tom

Tom would be considered older than average for a parent of young children, but when asked why he chose homeschooling said he “wouldn’t have it any other way.” Tom and his wife chose homeschooling out of concern regarding the quality of education their children would receive in a public school. His family has lived on several continents, and Tom believes that the varied learning environment has given depth to his children’s education. Thus far their online course usage has largely focused on history and civics courses for their children. As an older parent, Tom believes that immersion in technology naturally makes younger generations more intuitively skilled with technology. Tom said in his individual interview, “I think that kids can do that [use technology] better than 20-year-olds, and that 20-year-olds can do it better than 40-year-olds ... just because they kind of built their way through it and just grown up with it.” As a homeschool parent, Tom believes that common sense and the ability to learn are necessary skills to be taught to students.

Results

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. This section begins with theme development. Next, the specific themes and subthemes resulting from the individual interviews, focus groups, and journal prompts are discussed. Finally, the research questions are revisited and answered responses to each question are given, along with support using the participants’ quotes.

Theme Development

These findings are organized into five themes and 16 subthemes. They were identified from participant data. Each theme and subtheme will be discussed below. The theme curriculum

choice has the subthemes (a) educational freedom, (b) traditional values, and (c) educational opportunities. The theme communication has the subthemes (a) communication issues, (b) synchronous courses preferred, (c) impersonal courses, and (d) professor ability. The theme ownership of learning has the subthemes (a) perceived benefits of self-efficacy, (b) development of self-efficacy, and (c) development of self-regulatory skills. The theme college readiness has the subthemes (a) online learning chosen for college preparation, (b) perceived improvement of college readiness, and (c) perceived improvement of STEM readiness. Finally, the theme viability has the subthemes (a) online lab science effectiveness, (b) multimedia, and (c) online dangers.

Table 2

Keywords, Themes, and Subthemes

Keywords	Themes	Subthemes
choice, location, high standard, worldview, family, influence, access, variety	Curriculum Choice	Educational Freedom Traditional Values Educational Opportunities
interpersonal skills, synchronous, asynchronous, massive, automated, non-parent teachers	Communication	Communication Issues Synchronous Courses Preferred Impersonal Courses Professor Ability
success, time management, confidence, motivation, life skills, persistence, research skills, learning to be a learner	Ownership of Learning	Perceived Benefits of Self-Efficacy Development of Self-Efficacy Development of Self-Regulatory Skills

Keywords	Themes	Subthemes
dual credit course, worried about teaching math/science, peer comparison, tuition cost, advanced skills	College Readiness	Online Learning Chosen for College Preparation Perceived Improvement of College Readiness Perceived Improvement of STEM Readiness
hands-on learning, traditional classroom, recorded labs, the Internet, pornography, artificial intelligence	Viability	Online Lab Science Effectiveness Multimedia Online Dangers

Curriculum Choice

Curriculum choice is a major theme that emerged from the data and refers to the desire of homeschool parents to choose what they feel is the best curriculum for their children. Curriculum choice is divided into three subthemes: educational freedom, traditional values, and educational opportunity. A desire to find curricula which met specific requirements for their children was a factor for all participants in both the decision to homeschool and the decision to utilize online courses. This choice manifested differently in each participant.

Educational Freedom. Educational freedom emerged as a subtheme under the major theme of curriculum choice. Nine of the 12 participants mentioned it during data collection. Homeschool parents value the right to choose courses that they perceive will provide the best education for their children, rather than be mandated to use certain curricula. This may be due to a lack of confidence in local public and private schools, or it may simply be out of a desire to utilize an alternative educational method. Amy and her husband desired to use a classical education curriculum with their children which could emphasize Western literature, Latin, and religious thought. To achieve this, they found it necessary to homeschool their children. In her journal prompt, Amy explained:

I want to state that we have purposefully tried NOT to be pragmatists in our approach to education. We do not consider what most people consider “college and career preparedness” to be the end-all for our children. Instead, we think education should prepare them for the life vocations they will have, such as child of God, spouse, parent, sibling, as well as employee.

Another participant, Sarah, felt that homeschooling offers flexibility in scheduling not available in public or private education. In her individual interview, she noted, “I am a certified teacher and at the time when my kids were little, it just worked with our schedule, with my husband’s schedule to be able to be flexible. It just seemed to be better to homeschool.”

Tom expressed concern that public school would be inadequate to meet the individual learning needs of each of his children. He suggested that local districts prioritize maintaining uniformity over providing differentiated education to students. In his individual interview he explained “I don’t trust them ... they waste a lot of time. You have to fit in their pigeonhole, and nobody fits in a pigeonhole.” He felt that homeschool parents are the best-equipped and have the most at stake in making decisions regarding the education of their children. This is due to their familiarity with the specific strengths and weaknesses of the students, as well as their own prerogatives as parents.

Traditional Values. Another subtheme within the theme of curriculum choice was traditional values. Eleven of the 12 participants stated that they wished to impart traditional family values to their children. Traditional values uniformly meant Judeo-Christian values to the participants. Ashley and her husband opted to homeschool their children due to both her positive experience as a homeschool student and the desire to make faith a focus of their learning. Ashley expounded on this in her individual interview:

When I went to college, I was able to thrive and flourish, I got a good GPA. And so, I had the confidence to go ahead and homeschool my own children, and because we're Christians we wanted to make sure that the values that are important to us are being taught to our children.

Ashley also mentioned that wanting to have a close-knit family motivated them to choose homeschooling. She described this in language indicating that putting family first was a counter-cultural decision as opposed to going with the societal norm of sending her children to public school:

We decided to homeschool our children to keep those things in check, and also, I love being with my children. I would be sad to send them off and have somebody else teach them, I'm happy to teach them even though it has come with some sacrifices on our part. It's been very beneficial to our family, and we have a very close family as a result.

Another participant, Jessica, had a similar sentiment, noting that promoting a close family culture was a priority, both because of the role of the traditional family within Judeo-Christian values as well as practical necessity due to their rural farming lifestyle. In her individual interview she explained:

Well, we are in a rural community. When my daughter was getting to be of school age, I noticed when the bus drove by, and it was really early, like just after 7:00 in the morning, and then it didn't come back again until like 4:30. I was sitting there looking at my little girl thinking there's just no way I want her being formed by other people, particularly on a bus, without me that long. I wanted to be the one that formed her character, and I wanted to be the one to spend that time with her.

Intersecting feelings of duty to provide children with a wholesome upbringing and apprehension about missing key moments of their children's lives motivated participants to begin homeschooling. The concept and value of a traditional family ran strongly throughout participant remarks.

Although participants wanted their children to be grounded in traditional values, they still value the ability of online courses to expose their children to other worldviews, if done in an effective manner. One participant, Megan, felt that this interaction was important for homeschoolers, both as a means to learn more about different cultures and as a means of strengthening the values of her children. In her journal prompt she gave an example of an online class which did this:

Most [classes] have also involved learning how to communicate with other students to discuss topics that students may not agree on. Intro to Philosophy in particular required students to learn how to communicate with others that held different viewpoints from their own. Disrespect was not tolerated.

Educational Opportunities. An additional subtheme which emerged from curriculum choice was educational opportunities. Seven of the 12 homeschool parent participants chose to utilize online courses in the curriculum of their children because they opened up educational opportunities that otherwise would not have been available. When their children needed access to advanced courses or specialized services, participants (particularly in rural areas) tended to go to the only place such content was available to them: online courses. One participant, Sarah, homeschools several children who need specialized educational services. Since her family lives in a rural area, online courses provide access which otherwise would be unavailable. She elaborated in her journal prompt:

Educational therapy is specifically designed to challenge and strengthen a person's cognitive weakness and is not available in person in North Dakota. Having online access to this therapy has provided academic challenges specific to my children's disabilities.

In addition to lack of physical access to courses, the large size of some homeschool families can make it difficult to provide high quality education to all children. Jessica noted her large family size initially made it difficult to ensure that her high-school-aged children still had educational opportunities even when she had to focus her instructional energies on her younger children. In her individual interview, she noted:

I had a bunch of early readers that I was trying to work with, and I felt like my teenagers were ... it was either going to be them or the little kids. Someone was going to lose out, and I couldn't bear that. I thought if the older kids were accountable to someone else, they would be forced to move forward while I focused on the little kids.

Homeschool parents consider one strength of online education to be the sheer number of topics available as courses. Hannah, who homeschools her middle-school-aged children, noted that while her children have taken online courses for core subjects such as math and English, they have also taken more esoteric courses such as calligraphy due to availability and the interests of her children. In her individual interview she noted:

I would say the options are endless, that's an amazing thing with online courses ... there are so many choices and so many things that I maybe don't have an interest in that my kids do. There's a course on anything you can imagine. You can learn, you know, any skill, anything.

Homeschool parents use this curricular variety to meet specific needs or address specific interests in their children's education.

Communication

Communication is a major theme that emerged from the data analysis. It refers to student capacity to communicate effectively with other students or the professor in an online course and affects how homeschool parents perceive its academic value to their children. Ten of 12 participants mentioned communication during data collection. Communication is divided into four subthemes: communication issues, synchronous courses preferred, impersonal courses, and professor communication. In general parents who were satisfied with the online course experiences of their children felt that communication had been adequate. In her individual interview, Mariah noted succinctly, “It’s very encouraging for the student if they can understand what’s going on.”

Communication Issues. A subtheme which developed from communication was communication issues. The most common cause of participant dissatisfaction regarding online courses was communication issues. Half of the participants mentioned such issues during data collection. Michelle, a homeschool mother whose children took several STEM classes online, noted that communication capabilities present in online courses are often minimal at best. In her individual interview she noted:

One of the things that I haven’t thought was super helpful, my kids have taken college algebra online and it was pretty much automated. The way it’s run, they give you a problem to do. And if you can’t do the problem, you can get different options. You can move back into the text or they’ll solve the problem for you and then give you another similar problem. There is never any interaction with the teacher. There wasn’t really a space to ask questions. It was all kind of kind of just clicking through this online system.

Lack of interactivity or difficulty in reaching the professor was viewed negatively by participants. Kaitlyn, whose children used a variety of online resources, felt that the lack of ability to easily ask questions can hamper an online course, especially asynchronous courses. In a focus group she elaborated:

You don't have the interaction. You don't ... you can't question and answer. You can back it up and listen to what they said again, but there's no rephrasing. There's no "let me try to understand your question and rephrase it in a way that you understand better" so you can get stuck in there.

Another participant, Megan, mentioned that her children were frustrated with the communication in an online course, specifically relating to discussion boards. Other students did not take discussion posts seriously, so it was difficult for her children to have meaningful conversations with their peers even though the course possessed a functional avenue for communication. She noted in her individual interview:

A lot of classes have discussions, and they get frustrated with other classmates because they don't follow directions, or they have really terrible grammar or spelling or something. So, that has been a challenge to figure out what to do. They respond because they have to respond to, what, two or three people every week? How do you respond to someone who didn't even stay on topic or create a complete sentence that even makes sense?

Similarly, several participants noted that it is difficult for their children to develop interpersonal skills in online courses due to format choices. While positive about online courses in general, Michelle noted in her individual interview that there is no easy way for relationships to form in an online platform:

There's certain other things that probably aren't as easy to develop. I mean, the number one thing is relationships with other students. I would say online classes don't have an edge in that department at all.

Synchronous Courses Preferred. Another subtheme which emerged from communication was synchronous courses preferred. Notably participant critiques were mostly aimed at asynchronous online courses. In general, those whose children took synchronous online courses were more satisfied with the overall experience. Half of the participants directly noted a preference for synchronous courses. Participants seemed to feel that listening to a live teacher generally provided a more authentic classroom experience even if opportunities for students to talk were not readily available. Mariah, a homeschool mom whose children began to utilize online courses extensively during the pandemic, described how the most effective online courses used by her family are predominantly asynchronous to provide flexibility but have a synchronous component to encourage communication. In her individual interview, she noted:

I'm also seeing, even in a couple of things, is that maybe there's an asynchronous component for an upper-level course. But then also maybe a short in-person Zoom meeting half an hour or so as a check-in. And so, you're getting face-to-face.

She felt that by utilizing such a hybrid format, online courses are able to maintain the ease of delivery present in asynchronous courses while incorporating the authentic communication of synchronous courses. Another participant, Ashley, felt that synchronous courses are likely the future of online education. In a focus group, she suggested:

Doing these video lessons, video courses, equips our children for the real world of this century because everything is moving that way. Even the fact that we're doing this video conference call right now.

Kaitlyn similarly felt that synchronous live video classes will be even more common in the future. This was because she felt it is the superior method, and technology continues to improve.

In her individual interview, she theorized:

Well, I definitely think online is already better, because you can do live online, you can do some live/video combinations, where you can ask questions and submit things. I think even just the video quality is evolving.

Statements such as these suggest that participants consider trading flexibility for authenticity (synchronous over asynchronous) to be worthwhile.

Impersonal Courses. Another subtheme within communication was impersonal courses. Seven of the 12 participants noted that their children felt online courses were impersonal, and that they had a sense of being unknown by their classmates and the professor. These participants were also the most dissatisfied with the avenues of communication in an online course. Madeline is the parent of a homeschooled high school student planning on attending college. Her daughter's lack of feedback during an online dual credit course, however, was significant enough to make her initially question her decision to go to college. She explained in her individual interview, "She was, I'd have to say, scared, and came away almost disappointed, you know, like 'Is this what college is going to be? I just submit what I do?' You know, I think it was discouraging for her." While the class was beneficial in that it provided college credit, Madeline felt that most of the course was merely checking a box without any actual learning occurring. She noted in a focus group, "I didn't feel like she became better at what she was doing by taking the class. It was just like we fulfilled the class assignment and got her credit for it."

Experiences like these have resulted in several participants stating that they only use online courses due to the absence of similar courses or services being available in person. Most

participants felt that an in-person course would likely be superior to an online course covering the same topic. Heather, like Madeline, is a homeschool mother whose daughter also took dual credit courses online. She felt that although traditional courses are likely superior to online learning, the latter still provides a useful alternative for homeschool families. She stated in her individual interview, “I do think that in-person teaching is the best way, but it’s not always an option. So, it’s nice to have online, with homeschooling especially.” Participants felt that, in the end, easy access to online courses was enough of a boon for their children that it was worth overlooking weak communication or the occasional frustrating interaction with classmates.

Professor Ability. An additional subtheme within communication was professor ability. Nine of the 12 participants linked the quality of communication within an online course to the ability of the professor to facilitate it. In several situations, the children of participants achieved high grades in a course, but if a professor had poor communication skills, the family felt negatively about the course overall. Megan noted that positive communication from a professor helped encourage her daughter to greater achievement in an online science course. She noted in her individual interview:

Well, I’d say my kids ... they were good students for me, but they want to be good students for those professors, too. And so, they do really dig in and learn. My daughter is working on a genetics class right now, and she really wants to please the professor. She’s looking for those positive comments, and so, she is mastering genetics online through all of this.

Another parent, Jessica, noted that she likes it when online professors have high standards for students but communicate them clearly so that students know what will be expected

of them and can rise to the challenge. In her individual interview, she mentioned a specific instructor who stood out to her:

Science was actually the reason we looked into online learning. We did those classes initially, there was a guy who taught science. He was kind of a stickler, you had to do such and so, and your labs had to be just so, and I kind of liked that, it was really hard for me to do, so I wanted them to have a teacher that's super picky about that.

Conversely, Madeline felt that an instructor of an online course taken by her daughter was unable to provide useful feedback and hindered skill development as a result. She explained in a focus group:

You know, I just don't think ... I suppose every professor is different. And if you did one class or another class, it might be different. But I just can't see how they could ever help you perfect the hands-on stuff.

The specific learning environment of an online course is established by the instructor, according to Amy. In her interview, she felt that there are a variety of viable instructional methods for online learning, but that it is the responsibility of the professor to choose the correct method and implement it properly in a way which benefits students:

I think it depends on the teacher. Some teachers have been very good about bringing more complex questions and Socratic and rhetorical devices versus the basic comprehension sort of thing. And some teachers are not, they just ... it's a very basic sort of class. I think both are good, but it just depends on the teacher.

She suggested that professor communication and teaching style are also attributes which homeschool parents may consider when determining whether or not to enroll their children in an online course.

Ownership of Learning

Ownership of learning is another major theme that emerged during data analysis and refers to the value placed by homeschool parents on developing self-efficacy and self-regulation in their children. Ownership of learning is divided into three subthemes: perceived benefits of self-efficacy, development of self-efficacy, and development of self-regulatory skills. All participants felt self-efficacy and self-regulation were necessary to succeed as an adult in the 21st century.

Perceived Benefits of Self-Efficacy. A subtheme of ownership of learning was perceived benefits of self-efficacy. When asked about the role of self-efficacy, 11 of the 12 participants felt that it was necessary for both effective learning and success later in life. In her individual interview, Jessica gave an example of the role of self-efficacy in skill building from an online lab science course some of her children have taken:

One thing I noticed that had changed since the initial time I used it as a curriculum, they changed it to build confidence in the lab report component, which I noticed this year even different from last year, is they created an online tutorial basically, which was part of their grade. So, as they walked through the steps of the lab, that became part of their grade, and it walked them through it hand in hand and step by step. The kids actually gained that confidence to know what they're supposed to be doing, and then they got critiqued on each part of it, so, they knew where they made a mistake and were then able to adjust it and fix it. That was super effective.

Jessica felt that the self-efficacy developed by students during this assignment helped them to take ownership of their learning. Before students could develop the self-regulatory skill she mentioned, she noted that they first must believe they are up to the task. Another participant,

Mariah, felt that parents should actively seek to improve the self-efficacy of their children. Though it sometimes takes some effort on the parent's part and students may resist it at times, she felt that the long-term benefits of self-efficacy outweigh the effort involved. She elaborated in her individual interview:

I think each of my children has gone a little bit differently with that challenge. It is very overwhelming at first ... I'm always overseeing everything, even if I'm outsourcing certain things. To encourage them and help them with that planning, you know, depending on where they're at in executive function skills, they just might need a little more help with that ... I have one kid that, you know, will probably say everything is boring at some point. And just to get the message that "We don't quit on this. This is something we're going to see through to the end and we're going to figure it out if there's something that's making you nervous." So, definitely, we've had a few little uphill climbs, but net result? Quite positive.

A similar sentiment was echoed by another participant, Ashley. She has used online learning with her elementary school-aged children. She felt that the challenge of online learning is building confidence and problem-solving skills which will benefit her children later in life. She explained in a focus group:

Though it is a challenge, you have to stick with it more ... to force yourself to fight through those classes, even though it's not in-person or for my son with his guitar lessons to take the initiative on his own. And that's hard. But that's going to cause him to learn problem-solving.

Both Mariah and Ashely suggested that the process of developing self-efficacy in children requires the involvement of parents, both to recognize the benefits of self-efficacy, and to

encourage their children to stay the course when confronted with a challenge. Parents' recognition of the value of self-efficacy was necessary for student ownership of learning to occur via development of self-regulatory skills.

Development of Self-Efficacy. Another subtheme which emerged from ownership of learning was development of self-efficacy. A reoccurring theme mentioned by 10 participants was the goal of helping their children take ownership of their learning via development of self-efficacy. This ownership is often an especially high priority in online learning, which by nature requires more self-motivation for student success. Michelle expounded upon this in her individual interview:

Well, for my son, especially being able to see what he was capable of ... he was actually having to seek out answers on his own end, you know, contact professors and teachers on his own if he was having trouble because he knew there wasn't much I could do. And so that was a big part for him and my daughters, too, that whole process of learning to take responsibility for what they were learning, to be the one who made the contact with the professors and if they had questions or if they were having trouble or even if they just had to miss an online class and or needed to ask for an extension, you know, they had to take those responsibilities on their own, which I think prepared them for when they actually went away to college.

The fast pace of technological innovation within their lifetimes was cited as a motivator by participants for encouraging their children to be adaptable rather than focus on specific content knowledge. When asked about what was important for success later in life, Kaitlyn echoed this theme. In her individual interview she specified:

Honestly, I think it's just learning how to learn. I think it helps to be able to go, "If I don't know how to do something, there's probably a resource out there that I could follow along with and learn how to do it and fill in the gaps." Just the ability to tie into a new skill and use computer resources to do that is probably beneficial moving forward in just about any career right now.

The development of these learning skills was connected by participants to student ownership of learning. Tom felt that self-confidence (i.e., self-efficacy) leads to this sense of ownership and helps drive students to later success. In his journal prompt he mentioned:

While skills are important, and indeed necessary, to success later in life, they pale in comparison to self-confidence. If one has skills, but lacks self-confidence, that individual will rarely push ahead to use those skills efficiently. However, possessing self-confidence, one will most likely have the drive and wherewithal to obtain whatever skill should become necessary in the future. To put it in a more direct way, if you teach one what to learn (i.e., facts) that is all they know, but if you teach one how to learn, they will have the confidence and ability to learn whatever is necessary for future success.

This view, that possessing enough confidence to take risks and try new things is necessary for success, was echoed by other participants. One example is Heather, who felt that self-efficacy and ownership of learning in students will enable them to seek out opportunities later in life that they would otherwise pass by. In her journal prompt she stated:

I believe having self-efficacy is very important for success later in life. If a person doesn't believe they are competent in various skills, they are more likely to not even try to do things themselves. If they do believe they can accomplish tasks themselves, they're

more likely to jump in and get things done, and they're more likely to try new things if they've been successful in the past.

Participants indicated by their comments that they were more concerned about their children lacking the confidence to try hard things in life than they were about them failing. Self-efficacy was also viewed as necessary for students to develop self-regulation skills and become a lifelong learner.

Development of Self-Regulatory Skills. A subtheme which emerged from ownership of learning was development of self-regulatory skills. In their dialogue, 10 participants mentioned that an important element of students taking ownership of their learning was the development of self-regulatory skills (i.e., life skills). First and foremost among the skills mentioned was time management. Seven participants felt that their children were lacking in time management skills prior to using online courses, but that they improved as a result. Mariah gave an example of this in her individual interview:

We do have that built into our style of schooling, but it's more minimal. It's to teach to mastery and not necessarily by a certain date. So that's a little more flexible, but with online classes that we've had, there are things due at certain dates. And so, I felt like that was a really positive thing. I've had a couple kids who have missed a few dates or even a class session if it was a live class. And it usually doesn't happen more than once because then they're like, "What do I need to do to make sure I don't miss this deadline or this class?"

She suggested that development of time management was a necessary step for her children to take ownership of their own learning. To adhere to a course schedule and manage time effectively, Mariah found that her children first had to take responsibility for planning and

communicating with professors. She further elaborated that rather than being required to enforce a tight schedule herself, her children largely took the initiative for this themselves after initially failing to manage their time effectively:

It wasn't because I came down on them hard, like why did you miss the class, that they had that sense within themselves like "I had a responsibility to be here to submit this thing" and they actually somehow got that even though I don't do a lot of deadlines within what I do for schooling.

Similarly, Hannah noted that online courses are useful for the development of focus as well as organizing a school day. In her journal prompts she noted, "Online courses require a higher level of self-discipline. Online courses have also added structure to our homeschool day."

Along with time management, participants noted that their children overall had improved research abilities after being enrolled in an online course. Heather explained that her daughter was more comfortable using technology to learn after taking a dual credit psychology course in high school. This improved technological self-efficacy would, in Heather's opinion, help her daughter tackle harder educational challenges down the road. In her individual interview, she explained:

I think it's definitely helped her become more confident in her ability to use the computer for those kinds of things. A lot of times, educational programs are complicated. You got to log in to this, you've got to go to this place ... I think it's helped her figure that stuff out pretty easily, and I didn't do that for her. I let her kind of figure it out ... the classes she's taken have really helped her learn how to figure out those complicated systems pretty easily.

This echoed the sentiment of Mariah that children will rise to the challenge and take ownership of their own learning if given the chance. This suggests that participants are utilizing online learning as a form of scaffolding to develop life skills in their children before they graduate and leave home.

College Readiness

The theme of college readiness was cited by all of the participants as a factor behind the enrollment of their children in online courses. College readiness is divided into three subthemes: online learning chosen for college preparation, perceived improvement of college readiness, and perceived improvement of STEM readiness. Many participants chose online learning for their children due to the perceived benefits regarding college preparation. The actual benefits online courses conferred upon their children were perceived to be substantial, even though three of the participants were dissatisfied by their children's online experiences. Participants were also relatively positive about their children's ability to succeed in STEM careers after taking online courses.

Online Learning Chosen for College Preparation. One subtheme revealed from college readiness was online learning chosen for college preparation. College readiness was on the mind of all participants in varying degrees when asked why they enrolled their children in online courses. Several participants explained that they felt their children needed advanced courses to be ready for higher education, but that the participants felt unable to provide those courses at home. One participant, Kaitlyn, noted that online courses were selected as a means to cover weaknesses in the existing curriculum of her children. In her individual interview she noted:

The main benefit for us was that it filled in some of the gaps, especially in the higher education that was getting a little bit beyond our technical expertise. So, we felt like they weren't just reading a textbook and trying to figure it out, they were a little bit more of a lecture, a demonstration and videos and things that helped just bring it to life a little bit more.

Hannah, another participant, succinctly stated in her journal prompts that she uses online courses to bring content to her children that she does not possess the training to effectively teach: "My children are able to learn at a higher level than I can teach because of online courses."

The most common type of online course implemented by participants was dual credit. Participants chose dual credit courses because they offered exposure to college learning platforms, the ability to begin progress on a college degree while still in high school, and the overall reduced cost of a college degree. In her individual interview, Megan explained the specifics of children's dual credit usage:

I think they've all been dual credit classes from a local community college, not local like same town, but local within the state. So, they've always been at least a sophomore in high school and it's always been with a college professor. I can't think of any online classes we did that was not for credit.

Another participant, Heather, had her daughter take dual credit courses such as psychology to enable her to get college credit early as well as gain life skills necessary for success later in life.

In her individual interview, she explained:

I definitely feel like the dual credit courses that my daughter took have really helped her with regulating her schedule, kind of staying on track herself and just feeling confident

that she can do difficult work even at a young age. So, that's really helped with just her confidence in knowing she can do hard things.

Several participants mentioned that an unexpected benefit of online courses which helped improve the college preparedness of their children was the ability to compare themselves to their peers. Since homeschooling is by nature more isolated than public or private school, participants felt that their children sometimes have difficulty developing self-efficacy in their own skills because they have few other students their age with whom to compare themselves. One participant, Michelle, elaborated on this in her individual interview:

You know, when you're a homeschool kid, you're not constantly being compared to other kids at your same level. You know, you have a classroom full of kids and it gets back and everybody knows who's got the highest grade and who's got the lowest grade in class. And so, when you're homeschooled, you really don't know where you measure up compared to other kids. You don't know if the work that you're doing is sufficient. My oldest daughter ... doing things like taking the college classes online, taking a standardized test like the ACT, some of those kind of things that did compare her to other students showed her that she was going to be ready for college.

It is notable that some homeschool parents felt the need to add peer culture into their children's curriculum, since many suggested they initially chose homeschooling to avoid such influences.

Perceived Improvement of College Readiness. Another subtheme derived from college readiness was perceived improvement of college readiness. Participants were generally positive as to the effect online courses had on the college readiness of their children. Nine participants felt that online courses had a positive effect, while three participants felt they did not. Those who

felt that online courses did improve the college readiness in their children cited benefits such as improved self-efficacy, familiarity with learning platforms, and early development of life skills such as time management. Michelle, whose children have utilized dual credit courses, noted in her individual interview: “Taking actual college classes in the low-pressure environment at home gave them the confidence that their home education had been adequate to prepare them for college and that they were indeed capable of doing the college-level work.” Another participant, Mariah, was pleased that online learning had given her children access to college courses around the country as well as significantly reduced the cost of a college degree via dual credit courses. When asked during a focus group if online courses affected the college readiness her children, she enthusiastically responded:

100%, 1,000%, 1,000,000%! My first was able to complete all of his generals through online courses, some CLEP tests, so that was huge for him. That was a big goal for him, and he’s very motivated. So, we could look all across the country, we could pick and choose, and it was like the world was his oyster, as far as “let’s get these, let’s test out of this so you can get to your major field quicker.” But also, I don’t feel like his learning was sacrificed. It wasn’t like a slapdash approach to doing it. It was very nontraditional though.

Similarly, Megan, whose children took STEM courses online, explained that online learning helped her children adjust to the stress of deadlines and difficult assignments while at home, so by the time they got to college they were prepared for the workload. In her individual interview she elaborated:

My daughter was a sophomore at the time, and she would panic at the beginning of each 2-week period. The first one was really bad, the second one was just as bad because it

contained mid-term assignments. She stuck with it though and learned to divide her work out and work on a reasonable portion each day to meet the deadlines. By the third period I didn't hear any panic, she simply told me what she needed to accomplish. For the fourth period she just did it all without any comment at all.

Participants who felt that online courses had improved the college readiness of their children tended to speak along similar lines, noting the primary benefit was not specifically the content of the online course, but rather the self-efficacy and life skills instilled in their children.

Participants who were unsatisfied with online learning's effect on college readiness did not cite any benefits in these areas. Madeline, who was overall dissatisfied with her daughter's experience with online courses, felt that too much focus was put on meeting the whims of the professor or reducing complex topics down to basic themes. Although she did feel that her daughter's college readiness may have been improved, it was overall a terrible learning experience. In her journal prompt, she elaborated on some of what she saw in specific online courses:

Latin was just about completing the work. Western Culture History was more complicated in trying to see what the professor saw in art and trying to match her thoughts. Exposition was more about taking the complexity out and keeping it simple. Overall, the experience readied her for college and what it may look like. Unfortunately, I do not believe it advanced her skill level much with not much focus on the quality of work and correction.

Perceived Improvement of STEM Readiness. A further subtheme developed from college readiness was perceived improvement of STEM readiness. Nine participants felt that online courses had improved the ability of their children to succeed in STEM fields, should they

choose to do so. Some, like Jessica, felt that STEM topics were sufficiently advanced so that specialized training was necessary to improve student readiness for degrees or careers in related fields. In her individual interview, she noted that if her children expressed a desire to go into STEM, she would have to take it seriously and seek out the best courses possible:

I don't have any kids that have a real desire ... my youngest son is really the only one who has any kind of scientific deeper interest. He really enjoyed chemistry, but he still has no interest in going deeper into the field. So, I think you would have to find a separate class. If I had a kid who was super into that, I would find the best class that I could find online, and it would have to be that honors class. I wouldn't put them in classes with other kids, because it would frustrate them to no end.

Another participant, Amy, felt that online courses had improved the STEM readiness of one of her children who showed an interest in related topics. In a focus group, she responded:

For us, it did help. As I said, we were both college humanities people. So, when our son was a very science math person, he did that advanced math and science that we couldn't get him at home. So, it was definitely great for him in that sense.

Other participants felt that online courses had left their children better equipped to handle STEM topics, even if their children were not planning to go into STEM fields after graduation. In her individual interview, Heather stated that her daughter was more comfortable with STEM topics like math after taking an Algebra dual credit course online. She noted in her individual interview:

Mostly, like I said before with the math, just because I don't feel comfortable teaching the upper-level math very well. So doing the online courses has definitely helped my daughter progress in her STEM abilities, specifically math. And she's not going into a

STEM field, but I do believe that the online courses she's taken have definitely helped her with her STEM abilities.

Megan, whose daughter is planning to major in a STEM field in college, similarly felt that the large variety of STEM courses available online helped prepare her children for degrees. She stated in her individual interview:

I would say that my older daughter had to have a lot of science classes online, she went into biology and had had a couple biology classes online. My second daughter is going into equine science, and she's had to have genetics and other chemistry classes to prepare for that.

In most cases, participants seemed to think that online courses were beneficial in improving readiness for STEM degrees or careers if their children were already showing an interest in such a path prior to enrollment in the online course. This again suggests that homeschool parents intentionally select online courses to meet specific needs in their children, tying back to the first theme of curriculum choice.

Viability

Viability is the final theme that emerged from the data and refers to the specific qualities of online learning that make it suitable or unsuitable as curriculum for homeschool families, specifically in comparison to in-person learning. All participants referred to the viability of online courses during data collection. Viability is divided into three subthemes: online lab science effectiveness, multimedia, and online dangers. Participants made a number of comments about how the online platform itself introduced distinct benefits and concerns into the learning experiences of their children, and this theme examines those ideas.

Online Lab Science Effectiveness. A subtheme discovered in viability was lab science effectiveness. Nine participants discussed the viability of online labs. Online science courses were frequently selected by participants for their children due to lack of parental self-efficacy in teaching them and access to content experts online. The actual format used by online classes for the lab portion of each course varied greatly, however. Participant selection of individual science courses and perceived value of the science courses both appeared to be linked to the specific implementation of the lab component. In general, participants perceived greater benefit from taking online courses which more closely emulated the traditional lab experience, either by having students participate at home via lab kits, or by immersive simulations. One participant, Megan, listed several examples of positive lab experiences her children had during online science courses. In her individual interview, she went into detail:

They had to go out and get supplies like at the local grocery store or pharmacy or something. And then I had to take a picture and they had to upload the picture to prove that they actually did it with those supplies. And then they could write out their results. One of those classes, we had to buy a molecule kit, and so my daughter built molecules and snapped pictures of them and then uploaded them so the professors could see her molecules; I thought that was clever. There was one, I think Intro to Organic Chemistry, there was software that we had to buy and you were in a chemistry lab simulating the experiment. And so, you could see your hand where someone's hand was going out and mixing the chemicals, and it was realistic enough that if you mixed the wrong ones, you got an explosion. I thought that was pretty cool.

Participants preferred that their children be able to participate in labs in some hands-on way, even if the implementation was imperfect. Additionally, effective online labs seem to

utilize the strengths of the online platform by utilizing technology (such as submitting photos like Megan noted) while still providing a physical component. Varying qualities of dissections in biology labs were mentioned by several participants. Kaitlyn noted that she was pleased with an online dissection tutorial one of her children used to enable him to complete a series of dissection labs at home. She explained in her individual interview:

My son was really into it though, so we bought the whole dead animal package and the video to go with it. They actually did a pretty good job of showing close-up exactly what they were doing, and he was really proud of himself, that he was able to do it.

Several participants felt that when learning a physical skill online (such as conducting a science experiment), it was beneficial to combine the physical activity with multimedia content like a video to solidify the learning material in student memory. In her individual interview, Michelle gave an example of how an online course taken by her son had utilized both of these components:

Still, I think it's been done quite well in the two, he's taken chemistry and physics, which involved labs. We had to specifically order lab kits that had all the necessary chemicals and things, and we had some other supplies on hand already. I think, you know, that it probably wasn't as fun as doing a high school lab. Oftentimes, the teachers also have shown a video of the lab being done in their own labs, you know, to compare your results to that and so on.

Most participants felt that while online lab sciences were likely inferior to in-person labs, they provided a viable alternative for homeschool students. Some participants theorized that advances in online course design could significantly improve the quality of online lab experiences. One

participant, Hannah, had thus far avoided using online science labs with her children but felt that might change in the future due to the prevalence of online learning. In a focus group, she noted:

So, we haven't done a lot of STEM minus math, the other parts we've kind of been doing in our co-op and then we just do it as a family. But there again, as my kids get older, they are very interested in a lot of things STEM-related. And so, we will, you know, be using online resources much more frequently.

Multimedia. Another subtheme of viability was multimedia. Half of the participants cited the ability to easily incorporate multimedia content into coursework as a strength of online learning. As previously mentioned, participants typically felt that combining a video or audio component with another learning experience ended up strengthening online science courses. Ashley, a homeschool parent of two elementary-aged children, felt that multimedia material is effective at conveying content to students in a variety of modalities. In her individual interview, she explained how multimedia content helped her children learn a concept:

My daughter was in first grade this year, and so they have little, probably 30–45 second songs that taught her how to spell “1, 2, 3 ...” all the way through 12, and so she has all those memorized without really having to study spelling rules or anything like that. With the music incorporated in with the information, it's stuck in her head and she'll start singing. My son who's in third grade this year, he had some division videos he had to watch on YouTube, and that was good. Being a mom, I'm teaching him absolutely everything, so to have another teacher explain it in her best words through that little video was interesting to him.

Ashley suggested that the multimedia learning opportunities available in online courses help learners retain knowledge that otherwise would be difficult for them to remember, especially

young children. That being said, Heather felt that multimedia content could also improve online courses for high school students. She elaborated in her individual interview while discussing a dual credit algebra course taken by her daughter:

I think for math it was ok, it's pretty concrete. You know, I think it's pretty simple to display math ideas on a computer ... I can see how it would be difficult to present something as abstract as psychology, but for math, it worked pretty well.

Another participant, Hannah, felt that multimedia content can similarly help students engage with learning content when their minds would otherwise be prone to wandering. She elaborated in a focus group:

I think that yeah, it's definitely been very beneficial. My kids enjoy watching their little videos and they're learning these concepts where if I just read that to them from a book, they would be bored and they would be wiggly and they'd be wanting to get up and get a snack or whatever it may be. So, they definitely do enjoy it, and the videos and the online resources engage them.

Online Dangers. A further subtheme in viability is online dangers. While participants were positive overall about online courses, five of them noted that the platform is not without inherent dangers. Most frequently, participants expressed concern about letting their children use online courses given the prevalence of pornography available on the Internet. One participant, Jessica, noted that this was a concern that every homeschool parent must deal with if they plan to use online courses. In her individual interview, she cautioned:

I do think that the porn component ... if you're going to use online classes, you have to take it seriously and make sure there's filters. Parents really need to be encouraged to be involved and maybe be a facet of being part of it, because ... technical use is a really

good aspect of online courses because they get fluent in it, but then the ability to get fluent in going to places they shouldn't is right at their fingertips too.

Participants disagreed on what the proper age was to enroll children in online courses. Some, like Ashley, felt that online learning could begin as early as the elementary grades, while others, like Jessica, were apprehensive about students taking online courses before high school. Amy felt that middle school was the appropriate time to introduce online courses, since her children had established a foundation of study skills beforehand which could then be utilized to make online learning effective. In her journal prompts, she noted:

We did not place our children in any online courses until late middle school. At home we practiced memorization, recitation, and narration as a way to learn basic skills. As they read the logic and rhetoric stage, we put our children in the occasional online classes which practiced the classical model of education.

Most participants felt that it was a challenge keeping their children safe from dangers online while still making sure they were equipped with the technological skills and self-efficacy necessary for success later in life. Hannah, who has several homeschooled children in elementary and middle school, elaborated on this duality in her individual interview:

I would love to use even more technology in their learning. It's such a hard thing, because I'm also like, I don't want my children to even touch technology for as long as possible. So, you know, I don't want to do them a disservice and, you know, be 18 and not know how to run a computer or an iPad. But it's really difficult nowadays to know how to navigate that, you know? Especially with the Internet involved in everything.

Some participants felt that instead of benefiting students, the multimedia-nature of the Internet instead served as a distraction. Sarah, a homeschool parent whose children utilize

educational services online, felt that the Internet makes it hard for students to stay on task. In her individual interview she noted:

It's very easy for them to space out and not pay attention, and the teacher doesn't know necessarily because it's not always live, and we've run into trouble with the video playing in the background, but really, they're like watching YouTube videos on something else. Kind of like the modern equivalent of reading comic books instead of your history book.

Rather than multimedia content being a universal positive to learners, participants suggested that it is best used with care. When implemented poorly, it serves as a distraction which weakens learning, but when implemented effectively, it can help improve the quality of instructional material.

An additional concern felt by participants as an emerging danger of the Internet was the implementation of artificial intelligence (AI). Participants tended to view AI negatively and felt that such technology would at best cause online courses to grow more impersonal, and at worst be an active danger in the future. One participant, Tom, discussed this in his individual interview:

You know, I shudder for the future of online things with artificial intelligence coming in. It can make decisions about you that aren't accurate, and that could be very detrimental in some way ... all of a sudden, you get a machine that doesn't have empathy doing what a person should be doing. There could be some problems. I guess that's what parents are for. You don't just turn the kid loose with a computer any more than you do a gun or car.

Participants felt that, despite the goal of promoting student ownership of learning, there should also be a sense of caution and respect when considering the addition of online courses into the curriculum of children.

Research Question Responses

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. To this end, I developed a central research question and three sub-questions. The following answers were derived from data collected via individual interviews, focus groups, and journal prompts. The five themes discussed previously further elaborate on the answers to these questions.

Central Research Question

How do homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of preparation for college or careers in STEM fields? The participants' perspective is that online courses can effectively improve student self-efficacy by providing opportunities to develop student ownership of learning as well as life skills such as time management while still at home. Development of self-efficacy and development of life skills were both identified as subthemes of ownership of learning since participants felt they were necessary for its development. Tom said, "If you teach one what to learn, that will be all they know, but if you teach one how to learn, they will have the confidence and ability to learn whatever is necessary for future success."

Sub-Question One

How do online courses provide homeschool students with performance accomplishments that increase self-efficacy as well as STEM career selection? The participants' perspective is that

if online courses can provide students with challenges optimized for the platform, they feel empowered after completing them, increasing their self-efficacy. Within the theme of college readiness, it was determined that participants typically perceived students to be more prepared for college after completing online courses, largely due to experiencing college expectations at home. Similarly, within the theme of viability, it was noted that authentic online lab science courses are perceived to improve participant STEM career readiness regarding their children.

Megan said,

I think that sticking it out to finish any task builds self-efficacy because the person learns a pattern of persevering under difficulty that translates into the next difficult challenge.

Though the next challenge may be unrelated, they do at least have in common the fact that they were difficult challenges.

Sub-Question Two

How does participation in online courses affect college/career readiness via academic persistence in homeschool students, especially regarding STEM topics? The participants' perspective is that online courses improve college/career readiness by increasing their self-efficacy as they complete goals. Increased self-efficacy then leads to persistence, which in turn improves their college/career readiness by preparing them to work through difficulties encountered in higher education or the workforce. Within the theme of ownership of learning, persistence was linked to students' developing self-efficacy during online courses. This persistence helps them overcome the lack of interactivity, difficulty reaching the professor, and the impersonal nature of online courses discussed in the theme of communication issues.

Additionally, careful selection of courses by parents can help ensure students are challenged appropriately, as discussed in the curriculum choice theme. Michelle said,

I think students might persist academically because they truly have a desire to learn and a belief that they are able to do it. My children that have completed online courses have had a strong belief that they are capable of completing them.

Sub-Question Three

How does participation in online courses affect the ability of homeschool students to develop higher order skills from component skills? The participants' perspective is that the capacity of online learning to develop higher order skills in students is dependent on both the quality of the online course and the self-efficacy of the student. Within the theme of viability, it was discussed how the format of learning and the implementation of multimedia can affect skill development. Additionally, the authenticity of communication and ability of the professor to convey instruction (as discussed in the communication theme) were determined to affect learning of skills by students. For students to develop higher order content skills, they first have to develop study skills such as time management, as discussed in the theme of ownership of learning. Mariah said,

My student was very hesitant, and couldn't see how to accomplish the end result. With some planning of how long papers take, how to research the topic, and appropriate scaffolding, while letting them take the helm and really complete the work independently, they rose to the occasion.

Summary

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. Chapter 4 examined collected data from individual interviews, focus groups, and journal prompts. After analyzing the data, five main themes and 16 subthemes

were developed. These themes were then used to answer the central research question and the three sub-questions. The study found that self-efficacy results from effective online course implementation, improving the college and career readiness of homeschool students.

CHAPTER FIVE: CONCLUSION

Overview

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation. Data collected via individual interviews, focus groups, and journal prompts were analyzed and synthesized via Moustakas's (1994) phenomenological reduction, imaginative variation, and synthesis of meanings and essences. This study was guided by the dual theoretical frameworks of self-efficacy (Bandura, 1986) and scaffolding (Ninio & Bruner, 1978). Within this chapter are found a summary of findings, an interpretation of findings, theoretical and empirical implications, implications for policy and practice, limitations and delimitations, and recommendations for future research.

Discussion

In the following sections I examine the results of the study through the interpretations of the literature review and theoretical frameworks discussed in Chapter 2. The findings are briefly summarized and then interpreted. Theoretical and empirical implications are discussed, followed by implications for policy and practice. Limitations and delimitations are then discussed, and the chapter concludes with recommendations for future research.

Summary of Thematic Finding

Five themes were synthesized from the data collected during the study via individual interviews, focus groups, and journal prompts. These themes were then interpreted via the theoretical frameworks of self-efficacy (Bandura, 1986) and scaffolding (Ninio & Bruner, 1978) to answer the central research question and three sub-questions.

The five themes developed during data synthesis were curriculum choice, communication, ownership of learning, college readiness, and viability. From curriculum choice, the subthemes of educational freedom, traditional values, and educational opportunities were derived. Parent participants highly valued the freedom of being able to select the curriculum used by their children. This was largely driven by a desire to pass on traditional Judeo-Christian values to their descendants. Online courses were valued as they opened up educational opportunities which otherwise would not have been available, while still allowing parents the freedom to craft their own curriculum.

Communication strongly influenced participants' perceived value of online courses to their children. From it the subthemes of communication issues, synchronous courses preferred, impersonal courses, and professor ability were developed. Communication issues affected the development of self-efficacy in homeschool students enrolled in online courses. The impersonal nature of online courses, particularly those courses that were asynchronous, was viewed negatively by participants. Notably, the communication skills and overall perceived ability of the professor also greatly affected if participants viewed a specific online course positively or negatively.

Ownership of learning was considered by most participants to be equal or greater in importance to content knowledge. Its subthemes were perceived benefits of self-efficacy, development of self-efficacy, and development of self-regulatory skills. The homeschool parents interviewed for the study felt that a student must have confidence in their own abilities to even attempt challenges later in life, much less succeed at them. Developing student ownership of learning was considered by the participants to be part of self-efficacy growth, along with improving a variety of life skills such as time management.

College readiness was cited by participants as a major reason for enrolling their children in online courses. Three subthemes were determined: online learning chosen for college preparation, perceived improvement of college readiness, and perceived improvement of STEM readiness. College preparedness was a common reason for participants to enroll their children in online courses. After completing online courses, participants felt they had been an effective means of college preparation for their children, particularly if the participant felt uncomfortable teaching advanced coursework themselves. Additionally, online courses were viewed as effective preparation for degrees or careers in STEM fields specifically.

The final theme, viability, encompasses the particularities of online learning which participants felt made it suitable or unsuitable for use by their children. Three subthemes were developed from it: online lab science effectiveness, multimedia, and online dangers. Participants talked at length about the various formats of online science labs, and the consensus was that the best labs closely emulated an in-person experience while still harnessing the strengths of technology. The integration of multimedia content into online courses was viewed as a means of increasing student engagement, with a moderate risk of causing distraction. Even while praising the benefits of online courses, many participants expressed apprehension about the risk of their children encountering pornography or other obscene content while using the Internet, as well as the emerging issue of artificial intelligence.

Interpretation of Findings

When conducting this study, three elements stood out to me regarding how homeschool parents utilize online courses as scaffolding to improve self-efficacy as a means of college preparation in their children. During the data collection phase, I was able to individually interview homeschool parents, conduct focus groups with them, and review journal prompts

written by them regarding their use of online courses. After analyzing the data, it became clear that homeschool parents prioritize intentionality in online course selection, provide support rather than help to students, and develop lifelong learning skills in their children.

Intentionality in Online Course Selection

The parents I interviewed for this study chose online courses to meet specific learning needs of their children. A common example was selecting an online course on a specific topic due to a blossoming interest in one of their children. Participants would not automatically enroll subsequent children in an online course just because an older sibling had a positive experience; rather, they would look at the individual educational needs and interests of every child independently. This was especially true of parents with high school-age children. Participants frequently mentioned to me that they had chosen online courses to prepare a child for their chosen major in college (particularly STEM majors).

I also noticed that homeschool parents have high standards for the curriculum they use with their children. It was not uncommon for participants to tell me they had removed their children from online courses if the course was poorly designed or was perceived as being mostly busy work. Participants often spent large amounts of time searching for and evaluating courses on the Internet to find the exact topic and quality they desired for their children. Firmin et al. (2019) suggested that active involvement in the homeschool process, such as by exercising curriculum choice, improves parental perception of student success. The one situation I noticed in which participants were willing to allow their child to enroll in what they viewed as a subpar online course would be if it was dual credit. Participants considered the potential benefits to college readiness (by earning college credit) to be a worthwhile tradeoff for their children having to work through an online course of middling quality.

Support Rather Than Help

A common sentiment participants conveyed to me was that they wanted their children to experience and overcome obstacles in their learning at home to build their confidence. The homeschool parents I interviewed inferred that they wanted to provide the necessary tools for their children to succeed, but that their children must then use those tools themselves. Though not always identified as such, the participants clearly described online course usage as scaffolding to develop character traits like self-efficacy which would aid their children later in college or the workforce.

It became clear that online courses are uniquely suited to provide an arena of practice for this scaffolding to take place, since they allow homeschool students to experience rigorous courses at home. Participants told me they valued the ability to introduce their children to the format and expectations of college work, particularly with dual credit courses. I noticed that for this to be an effective strategy, homeschool parents must correctly evaluate the skill level of their children and place them in a class which challenges them without overwhelming them. The participants I interviewed were quite adept at knowing the academic strengths and weakness of their children, however. This allowed the parents to strike the right balance between letting their children figure things out for themselves (increasing self-efficacy) and providing support when necessary (to prevent discouragement). Participants told me that typically their children would rise to meet, or even exceed, parental expectations. Norman et al. (2020) similarly found that homeschool students tend to be initially overwhelmed in online courses but then improve as they gain confidence.

Lifelong Learning Skills

Although content knowledge is valued by homeschool parents, especially if their children are planning to choose STEM fields of study, participants put an even greater curricular emphasis on the development of lifelong learning skills. The consensus was that the breakneck pace of technological progress makes it difficult to equip children with skills that will be relevant later in life. Participants told me they wanted their children to instead be able to easily learn new skills or content as needed. More specifically, participants wanted their children to have the self-efficacy necessary to continue learning throughout their lives. This self-efficacy to be a lifelong learner is thought to be linked to online course participation (Tang et al., 2022). Without confidence in their ability to pick up new skills, homeschool parents felt their children would lack the motivation to try.

Another facet of lifelong learning stressed by participants was the ability to be able use technology effectively but in moderation. Part of learning to use technology effectively, participants suggested, was being able to maximize the positives and minimize the negatives. Homeschool parents try to equip their children to steer around the dangers of technology while still having the technological skills necessary for success. An example of this is how online courses provide academic benefits to students but require care navigating the Internet at large. Teaching their children to navigate the waters of technology before leaving home is another way that homeschool parents provide scaffolding.

Theoretical and Empirical Implications

The theoretical and empirical implications of the study are discussed in the following sections. This study used Bandura's (1986) theory of self-efficacy and Ninio and Bruner's (1978) scaffolding theory as frameworks. Recommendations are made for stakeholders regarding the

use of online courses as scaffolding to improve the self-efficacy of homeschool students as college preparation.

Theoretical Implications

This study used the theories of self-efficacy (Bandura, 1986) and scaffolding (Ninio & Bruner, 1978) as a theoretical framework. The study examined the use of online courses as scaffolding to improve the self-efficacy of homeschool students as a means of preparation for college or careers in STEM fields. The theory of self-efficacy holds that perception of skill level is directly tied to actual performance. The findings of this study suggest that homeschool students' perceptions of their abilities do indeed affect their performance, as they felt more comfortable continuing on to college after building confidence in online courses. The theory of scaffolding suggests that providing educational supports (i.e., scaffolding) to learners can allow them to improve performance. Once the supports are no longer needed, they can be removed. The findings of this study suggest that online courses can be an effective means of providing scaffolding to homeschool students. Participants viewed online learning as a support, which was then removed when students finished the course or graduated.

Homeschool parents who participated in the study viewed self-efficacy as a character trait necessary for success later in life. Many felt that without belief in themselves, their children would lack the confidence to try difficult things, potentially missing out on many opportunities in life. Having a supportive environment to work on developing self-efficacy was viewed as a priority. The homeschool environment, along with parental support, functions as scaffolding for the student's self-efficacy to improve. Though those supports will eventually be removed (when the student reaches college or a career), participants felt that the self-efficacy would remain.

Development of self-efficacy has been linked to self-regulated learning (Xu et al., 2022). Self-regulated learning refers to a student's ability to utilize study skills such as time management and concentration. Participants in this study identified self-regulated learning skills as related to self-efficacy. The self-efficacy of homeschool students, participants said, tended to improve as they got better at time management and other academic skills while taking online courses. This connection between participant in online courses and development of self-regulated learning skills was also echoed by Song and Kim (2021). Scaffolding provided by homeschool parents helps facilitate this skill gain. This aligns with research by Wu et al. (2019) which stated that scaffolding in online STEM courses works best when crafted specifically for each learner (also called adaptive scaffolding). Homeschool parents are in turn able to provide adaptive scaffolding to their children, as they work closely with them to provide support suited to their individual needs.

Empirical Implications

While a great deal of research has been devoted to homeschooling, online learning, and STEM career selection separately, little has been devoted to all three, especially through the lens of self-efficacy. Additionally, little research has been conducted about the homeschool population in North Dakota. There is thus a gap in the literature regarding the specific use of online courses by homeschool students as a means of preparation for STEM degrees or careers, which this study addressed.

The study has several empirical implications for the existing literature. The necessity of effective communication is stressed throughout literature regarding online courses. Baldwin and Ching (2018) noted that for an online course to facilitate learning, it must meet several communication criteria. Specifically, it must have clear objectives, it must be easy to contact the

professor, it must possess an authentic method for students to communicate with each other, and it must have an intuitive design. These conclusions were supported by participant data from this study. Participants strongly felt that communication issues have the potential to negate the effectiveness of an online course, especially difficulty in contacting the professor. Having a viable method of communication between students would also help facilitate the peer comparison which some participants felt was necessary for self-efficacy improvement in their children.

A variety of attributes were identified in the literature as vital for effective online STEM courses, namely active learning activities, strategies for interactive engagement, and robust assessments (Chen et al., 2018). Participant statements in this study supported these choices. The participants' perceived value of online lab science activities to students was typically linked to how closely the participant felt the activities mimicked a traditional lab course (i.e., hands-on activities). High student engagement was similarly viewed positively by participants in this study while impersonal online courses were viewed negatively. Finally, robust assignments that did not waste student time or leave them confused were also deemed necessary, with busy work sometimes disliked enough to result in a student dropping a class.

The implementation and benefits of multimedia content within online courses were discussed within the literature. In a 2019 study, Moorefield-Lang noted that when utilized effectively, multimedia content improves online courses by providing different avenues of content acquisition, as well as offering various accessibility options to students. These conclusions were echoed by participants in this study, who felt that the audio-visual nature of online courses helped students of all ages grasp advanced content. Similarly, multimedia content was viewed by participants as an effective way for online courses to facilitate acquisition of

skills, such as lab science courses or traditional crafts. This acquisition was aided by accessibility features described by Moorefield-Lang, such as the ability to rewind video or access subtitles.

One area in which the study diverged from existing literature involved participant views toward online science labs. Current literature suggests that online labs can be just as effective as traditional labs in promoting student skill acquisition (Kefalis & Drigas, 2019), but participants in this study strongly felt that online labs, while a decent alternative, were clearly the inferior option. While participants in the study ultimately went with online courses anyway due to other perceived benefits, this study's findings indicate that online courses are still viewed as an alternative or secondary format by many homeschool families.

Implications for Policy and Practice

The findings of this phenomenological study resulted in several implications for policy and practice. The data revealed how homeschool parents use online courses to provide scaffolding as a means of increasing self-efficacy in their children, thereby improving college and career readiness. These implications are examined in detail to increase transferability.

Implications for Policy

The findings of the study suggested that homeschool parents will readily enroll their children in dual credit courses or other methods of acquiring college credit in high school. Local colleges offering these courses may find it beneficial to market them to homeschool families. Homeschool families unaware of the option of dual credit courses might enroll their children if given the chance to learn about it. Additionally, since participants noted that the ability to develop skills such as time management was vital to their students' success in online courses, it would be beneficial for colleges offering such courses to include content explaining study skills and recommendations for success in college-level work. This could include a brief scheduling

tutorial with time estimates for assignments so students could determine how to spread coursework out over a week, or something similar.

Since communication was specified by participants as a frequent weakness of online courses, colleges or institutions should design online courses to provide authentic, timely, and personalized feedback to students. This is especially vital for homeschool students who are typically used to individualized feedback from parents. This may mean offering courses with smaller class sizes. In general participants suggested they would pay more for a more authentic online course, so offering synchronous courses with small class sizes could be viable for institutions marketing their courses toward homeschool families.

Implications for Practice

An implication of practice for homeschool families is that parents should encourage their children to take ownership of their own learning, specifically regarding time management. Success in online courses was perceived to be related to students taking the initiative with their learning and treating classes as a trial run for college. For many students, parental encouragement, and sometimes support, was necessary to navigate early portions of online courses when student self-efficacy was still somewhat low. Additionally, homeschool families should carefully review the format of an online course before enrolling their children in it. Some participants expressed disappointment in asynchronous courses if they were expecting them to offer levels of feedback or dialogue more commonly associated with synchronous courses.

An implication of practice for schools or colleges offering online courses is that homeschool families often place higher perceived value on online courses if they seem to emulate traditional courses authentically. It may be beneficial for schools offering online courses to homeschool students, particularly in STEM fields, to utilize features to increase this

authenticity. Possible options for this might include courses that could be presented in a synchronous format rather than asynchronous and including a hands-on lab activity for students to do at home if applicable. Additionally, homeschool parents may be more likely to enroll their children in an online course if there is some method of blocking out the rest of the Internet while the course is active. Participants expressed interest in online courses being developed so that other browser windows or programs could not be opened while the course was running. It might be worth the time for institutions to investigate the viability of such a design.

Limitations and Delimitations

Several limitations existed in this study, mostly pertaining to participant selection. Nearly 100% of participants were Christian (either Catholic or Protestant). This was not one of my screening criteria. I believe this occurred because most of my recruitment methods focused on faith-based homeschool organizations, as they are prevalent in North Dakota. The most notable way this affected my research was in my determination that traditional values were important to homeschool families. Additionally, over 90% of my participants were female. This was somewhat expected due to my specification that participants be the primary homeschooling parent. Another limitation was the small sample size. I had great difficulty recruiting even the minimum number of participants necessary for this study. It likely would be improved by a larger sample size.

Several delimitations were chosen for this study, which are boundaries on the information included. I did not reveal specific ages of participants or their children, or the towns or regions they reside in within North Dakota to protect their privacy. Additionally, I did not include any information on the academic success of homeschool students beyond high school (i.e., college

graduation rate) because such information would be difficult to obtain or not yet available, as well as outside the scope of this study.

Recommendations for Future Research

Considering the limitations and delimitations of this study, several recommendations can be made for future research. Future study about homeschool families in North Dakota might benefit from specifying whether participants identify as Christian or hold traditional values. Though this study did not specify what subject taken via online course during recruitment, it might be helpful to do so in future studies. Similarly, it might be helpful to specify the age of participant children who had taken online courses, since the experience of an elementary school-aged child is likely considerably different than a high school student taking dual credit courses. Utilizing different data collection methods might yield beneficial data. It was extremely difficult to coordinate focus groups among participants, largely because I collected my data in the late spring. North Dakota is predominantly a rural state, and participants who farmed were virtually impossible to reach once planting season began. Thankfully all participants were eventually able to schedule a time, but it may be better to run future studies during the fall and winter months.

Future research could be conducted on what life skills are favored by homeschool families, and how they relate to the presence or absence of traditional values. Research regarding homeschool parent perception of STEM topics and their value could also be beneficial, as this would help flesh out the motivations behind homeschool curriculum choices. The relationship between homeschool parents' perception of success and emphasis on college preparation in the curriculum of their children would be another possibility.

Conclusion

The purpose of this phenomenological study was to examine how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation, especially regarding STEM fields. Homeschool parents from North Dakota who had utilized online courses with their children completed individual interviews, focus groups, and journal prompts to establish a rich body of data. By using a dual theoretical framework of self-efficacy (Bandura, 1986) and scaffolding (Ninio & Bruner, 1978), three distinct elements emerged from the data: intentionality in course selection, support rather than help, and lifelong learning skills.

Homeschool parents have a strong conviction that they are the best advocates for their children, and their implementation of online courses distinctly reflects this. Homeschool parents choose online courses based on their worldview and values, on the specific strengths and weaknesses of each learner, and as preparation for the future goals and dreams of their children. This intentionality of curriculum selection is an act of obedience to the biblical mandate in Proverbs 22:17 to “train up a child in the way he should go” (*English Standard Bible*, 2001). To that end, online courses are used both as means of conveying knowledge and methods of fostering the character and skills necessary for life. Homeschool parents intentionally use these controlled challenges to strengthen the resolve of their children in a safe environment as preparation for their future vocations. As these vocations can change over time and technology continues its relentless advance, emphasis is placed on developing the attribute of lifelong learning. These findings indicate that online courses should focus on the development of learning skills and prioritize authentic experiences which can build the self-efficacy necessary for future schooling, careers, or whatever calling students find placed upon their lives.

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Appendices

Appendix A: IRB Approval

LIBERTY UNIVERSITY

INSTITUTIONAL REVIEW BOARD

December 16, 2022

Andrew Robinson
Gail Collins

Re: IRB Exemption - IRB-FY22-23-541 A Phenomenological Study Examining the Experiences of Homeschool Parents Who Use Online Courses As Scaffolding to Improve Their Children's Self-Efficacy

Dear Andrew Robinson, Gail Collins,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(iii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,
G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

Appendix B: Recruitment Ad

HOMESCHOOL PARENTS IN NORTH DAKOTA: I am conducting research as part of the requirements for a doctoral degree at Liberty University. The purpose of my research is to understand how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college and career preparation, especially in STEM fields. To participate, you must be a resident of North Dakota, the primary parent of a child who is or was homeschooled, using or has used at least one online course as part of their curriculum, and have submitted a statement of intent to homeschool in the state of North Dakota. Participants will be asked to participate in an individual interview (in-person or virtual) (30-60 minutes), a virtual focus group (60 minutes) and complete a set of journal prompts (30-60 minutes). Participants will have two weeks to complete the journal prompts. Interviews and focus groups will be audio-recorded. Participants will also be sent transcripts of their individual interviews and portions of the focus group for review (30 minutes total). If you would like to participate and meet the study criteria, please click [here](#) to complete the screening survey and schedule an interview. A consent document will be emailed to you if you are eligible after completing the screening survey. The consent document contains additional information about my research. If you choose to participate, you will need to sign the consent document and return it to me via email before the start of the interview.

Appendix C: Recruitment Letter

Hello,

As a doctoral candidate in the School of Education at Liberty University, I am conducting research as part of the requirements for a doctoral degree. The purpose of my research is to understand how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation, especially in STEM fields. I am writing to invite eligible participants to join my study.

Participants must be a resident of North Dakota, the primary parent of a child who is or was homeschooled, is using or has used at least one online course as part of their curriculum and have filed a statement of intent to homeschool in the state of North Dakota. Participants, if willing, will be asked to participate in an individual interview (either in-person or virtual) (30-60 minutes), a virtual focus group (60 minutes), and complete a set of journal prompts (30-60 minutes). Participants will have two weeks to complete the journal prompts. Interviews and focus groups will be audio-recorded. Participants will also be sent transcripts of their individual interviews and portions of the focus group for review (30 minutes total). Names and other identifying information will be requested as part of this study, but the information will remain confidential.

To participate, please click [here](#) to complete the screening survey and schedule an interview.

A consent document will be emailed to you if eligible after completing the screening survey. The consent document contains additional information about my research. If you choose to participate, you will need to sign the consent document and return it to me via email before the start of the interview.

Sincerely,

Andrew Robinson
Ph.D. Candidate



Appendix D: Screening Survey

Screening Survey

Title of the Project: A PHENOMENOLOGICAL STUDY EXAMINING THE EXPERIENCES OF HOMESCHOOL PARENTS WHO USE ONLINE COURSES AS SCAFFOLDING TO IMPROVE THEIR CHILDREN'S SELF-EFFICACY

Principal Investigator: Andrew Robinson, PhD candidate, Liberty University

1. Are you a resident of the state of North Dakota?
2. Have you filed a statement of intent to homeschool with the state of North Dakota?
3. Are you the primary parent of at least one child who is currently or has in the past been homeschooled?
4. Have you utilized at least one online course as part of your child's homeschool curriculum?

After submitting this survey, I will contact you shortly via email to let you know if you will be able to participate in the research study. Thank you for your time.

Appendix E: Acceptance and Rejection E-mails

Acceptance Email

Thank you for your interest in participating in my research study regarding the use of online courses by homeschool parents. The results of your screening survey indicate that you would be eligible to participate. A consent document is attached to this email and contains additional information about my research. If you choose to participate, you will need to sign the consent document, take a photo of it or scan it, and return it to me via email.

Thank you for your participation, I look forward to hearing from you!

Andrew Robinson
Ph.D. Candidate
Liberty University

Rejection Email

Thank you for your interest in my research study regarding the use of online courses by homeschool parents. The results of your screening survey unfortunately indicate that you are ineligible to participate. Thank you for completing the screening survey and taking the time to contact me.

Andrew Robinson
Ph.D. Candidate
Liberty University

Appendix F: Consent Form

Consent

Title of the Project: A PHENOMENOLOGICAL STUDY EXAMINING THE EXPERIENCES OF HOMESCHOOL PARENTS WHO USE ONLINE COURSES AS SCAFFOLDING TO IMPROVE THEIR CHILDREN'S SELF-EFFICACY

Principal Investigator: Andrew Robinson, PhD candidate, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be a resident of North Dakota, the primary parent of a child who is or was homeschooled, using or have used at least one online course as part of their curriculum, and have filed a statement of intent to homeschool in North Dakota. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

What is the study about and why is it being done?

The purpose of the study is to understand how homeschool parents utilize online courses as scaffolding to improve self-efficacy in their children as a means of college or career preparation, especially in STEM fields. Self-efficacy is similar to self-confidence and refers to an individual's belief that they can perform a task successfully. Research has previously linked self-efficacy to success in college or careers later in life.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following things:

1. Participate in an individual interview, to be conducted either in-person or via video conference. The interview will take 30-60 minutes and the audio will be recorded.
2. Participate in a focus group, to be conducted via video conference with other participants. This will take approximately 60 minutes and occur on a separate date after the individual interview. Audio will be recorded.
3. Complete a journal prompt exercise after the focus group. Participants will complete the journal prompts on their own and email them when complete. The prompts should take about 30-60 minutes to complete. Participants will have 48 hours to complete the prompts upon receiving the initial email.
4. Review recorded transcripts from the individual interview and focus group for review. This should take about 30 minutes to complete.

How could you or others benefit from this study?

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include adding to the body of scholarly research regarding homeschooling as a viable educational method.

What risks might you experience from being in this study?

The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records. Data collected from you may be shared for use in future research studies or with other researchers. If data collected from you is shared, any information that could identify you, if applicable, will be removed before the data is shared.

- Participant responses will be kept confidential by replacing names with pseudonyms.
- Interviews and focus groups will be conducted in a location where others will not easily overhear the conversation.
- Data will be stored on a password-locked computer and may be used in future presentations. After three years, all electronic records will be deleted.
- Interviews and focus groups will be recorded and transcribed. Recordings will be stored on a password locked computer for three years and then erased. Only the researcher will have access to these recordings.
- Confidentiality cannot be guaranteed in focus group settings. While discouraged, other members of the focus group may share what was discussed with persons outside of the group.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

What should you do if you decide to withdraw from the study?

If you choose to withdraw from the study, please contact the researcher at the email address included in the next paragraph. Should you choose to withdraw, data collected from you, apart from focus group data, will be destroyed immediately and will not be included in this study. Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Andrew Robinson. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at [REDACTED]. You may also contact the researcher's faculty sponsor, Dr. Gail Collins, at [REDACTED].

Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971

University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515; our phone number is 434-592-5530, and our email is irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

The researcher has my permission to audio-record me as part of my participation in this study.

Printed Subject Name

Signature & Date

Appendix G: Individual Interviews

Individual Interview Questions

1. What initially led you to homeschool your children? (CRQ)
2. Please describe how you have implemented online courses into the curriculum of your children. (CRQ)
3. What led you to implement online courses in your family's curriculum? (CRQ)
4. Self-efficacy refers to individual perception of skill level or competence regarding a task or domain. Building self-efficacy typically requires students to overcome challenges (performance accomplishments) to improve their sense of competence. In what ways are online courses able or unable to adequately provide these challenges? (SQ1)
5. Academic persistence refers to the ability to complete an academic course or degree despite encountering difficulties along the way. Increased academic persistence has been linked to self-efficacy. Do you believe online courses have had any effect on academic persistence in your children (i.e., ability to work through difficulties)? In what ways? (SQ2)
6. STEM refers to science, technology, engineering, and mathematics. Do you believe participation in online courses has affected the ability of your children to succeed in STEM degree programs or careers, should they choose to do so? (SQ1, SQ2)
7. The educational theory of scaffolding suggests that to develop higher order thinking skills, students must first master basic skills and successfully combine them to develop advanced skills. An example of this would be that before successfully solving an algebra problem, a student must first master basic mathematics concepts such addition/subtraction, decimals, and order of operations. Do you think online courses are able to provide opportunities for students to develop higher order thinking skills? How so? (SQ3)
8. Overall, would you say online courses have improved the college/career readiness of your children? Why or why not? (CRQ)
9. Do you believe the benefits (if any) of online courses were due to the online format, or simply because of the course content? Why? (CRQ)
10. What skills do you believe are important for persistence in college or careers? Do you believe online courses are able to adequately prepare students to use these skills? (SQ2, SQ3)

11. How has the use of online courses affected the self-efficacy of your children regarding the use of technology in an educational setting? In this context how would online courses affect the college readiness of your children? (SQ1, SQ3)
12. The use of online courses could be considered scaffolding since they provide an educational aid to students which will eventually be removed once they master the content. In what ways do you think online courses have helped your children master a concept? Please list specific courses and examples of mastery. (CRQ, SQ3)
13. Some STEM topics (such as laboratory science courses) are typically considered more difficult to present authentically in an online format due to the challenge of skill acquisition. In what ways (if any) have online courses helped your children develop educational skills? (SQ1, SQ2)
14. What are some weaknesses of online courses that have potentially hindered your children's self-efficacy? Please list specific courses and examples. (CRQ)
15. What improvements do you expect will be implemented in online courses in the future to better prepare students for college and careers? (CRQ)

Appendix H: Focus Groups

Focus Group Questions

1. What are some benefits of online courses that you have noticed while homeschooling your children? (CRQ)
2. What are some challenges to online courses that you have experienced while homeschooling your children? (CRQ)
3. In what ways are online courses able or unable to provide suitable challenge to improve student self-efficacy? (SQ1)
4. What effect (if any) have online courses had on the academic persistence of your children? (SQ2)
5. How is the online platform suitable or unsuitable for development of higher order thinking skills? (SQ3)
6. In what ways have online courses affected the college/career readiness of your children? (CRQ)
7. How do you think the use of online courses has affected the ability of your children to succeed in STEM degree programs or careers? (SQ1, SQ2)
8. In what ways have online courses provided opportunities for your children to master content? (CRQ, SQ3)
9. In what ways have online courses affected the self-efficacy of your children regarding technology in an educational context? (SQ1, SQ3)
10. In what ways have online courses provided support for your children regarding the development of skills (such as research skills)? (CRQ, SQ3)

Appendix I: Journal Entries

Journal Prompt Questions

Please answer each prompt in one to two paragraphs. When complete, please send your answers to the researcher at [REDACTED]. Please complete and return the prompts within two weeks of receiving them. If you have any questions regarding the prompts, please contact the researcher at the above email.

1. Self-efficacy refers to individual perception of skill level or competence regarding a task or domain. How would you compare the importance of self-efficacy to actual skills regarding success later in life?
2. Research has suggested that academic persistence (sticking it out to finish a difficult course or degree program) is related to student self-efficacy level. Why do you think this might be? What effect (if any) have online courses had on the academic persistence of your children?
3. It has been suggested that self-efficacy in students is improved by overcoming obstacles which appear challenging but are moderate in difficulty. In what ways have online courses been able to adequately provide such challenges for your children? Please list specific courses and examples.
4. The development of higher order thinking skills (necessary for college/career success) has been suggested to result from combining basic skills in a structured environment. In what ways have online courses been able to provide a viable environment for your children to practice developing these higher order thinking skills? Please list specific courses and examples.
5. In what ways have online courses been effective at preparing your children for college or careers? Please list specific courses and examples.

Appendix J: Researcher Reflexive Journal

Date	Entries
8/1/22	In order to achieve epoche as defined by Moustakas, I must set aside my own biases regarding the topic of the study. I view homeschooling in a positive light as I was homeschooled, I have taught in homeschool communities, and plan to homeschool my own children. Additionally, I view online courses positively since all my graduate work has been in an online environment and I likely would not have had the opportunity to otherwise continue my education if not for the online format.
1/27/23	Due to difficulty in recruiting participants via homeschool email newsletters, I have obtained permission to set up a booth at the North Dakota Homeschool Association Convention February 16-18th
2/18/23	I was able to recruit several participants at the convention and had a positive experience talking to homeschool families about my research.
3/13/23	Since I still lack enough participants, my wife posted my recruitment ad to social media. It has generated a large amount of spam and a couple participants.
4/29/23	I have nearly enough participants but am a bit discouraged that recruitment is so difficult. I am reaching out via email directly to a few individuals who professed interest in participating.
5/12/23	By the grace of God and help of my wife, recruitment is finally complete.
6/14/23	After much difficulty coordinating schedules, data collection is complete. It was quite hard for farming participants to find time during planting season, but they made time for the study. I am very grateful for their help.
6/19/23	Transcription and data analysis took quite a bit longer than I expected. I feel satisfied that I have a solid foundation to begin data synthesis with.
6/21/23	Data synthesis was quite confusing. I had to consult the Moustakas text repeatedly throughout to figure out what I was doing. In the end I believe I developed authentic themes.
6/24/23	After taking off a week of work and focusing exclusively on writing, I believe Chapters 1 – 5 are complete. I will likely have revising to do, but I feel good about the progress.

Appendix K: Audit Trail

Audit Trail

Date	Entries
11/8/22	Proposal Defense Completed
12/16/22	IRB Approval Acquired
1/12/23	Recruitment Ad Posted
5/12/23	Recruitment Completed
5/24/23	Interviews Completed
6/2/23	Focus Group Completed
6/14/23	Journal Prompts Completed
6/19/23	Data Analysis Completed
6/21/23	Data Synthesis Completed
7/3/23	Inquiry Edit Completed
7/21/23	APA Edit Completed
7/21/23	Final Defense Completed