The Lived Experiences of Faculty in the COVID-19 Pandemic Shift in Instruction

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THE LIVED EXPERIENCES OF FACULTY IN THE COVID-19 PANDEMIC SHIFT IN INSTRUCTION

by

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ABSTRACT

This study sought to understand the lived experiences of mathematics faculty teaching during the COVID-19 pandemic’s rapid shift from on-campus instruction to online education. Faculty are the primary influencers at a college. Their perspectives on the challenges and changes to teaching practices may determine a college's response to improving teaching and learning during a crisis. At the time of the COVID-19 transition, many faculty had no experience creating and teaching an online course, and some had previously been resistant to teaching online. Using a phenomenological approach, nine participants at a large state college were interviewed using the Teacher-Centered Systemic Reform (TCSR) model (Gess-Newsome et al., 2003) as the framework. Five themes emerged from the initial layer of contextual awareness. The themes described participants’ inner turmoil based on the pandemic environment and the subsequent changes. The participants described the phenomena in five overlapping themes of emotional context: a) professional emotion challenges, (b) professional learning, (c) pedagogy, (d) teacher culture, and (e) instructional values. The findings revealed a new category to the Teacher-Centered Systemic Reform (TCSR) model, emotional context. The study filled a gap in the literature regarding math faculty experiences and provided recommendations for both faculty and administrators.

Keywords: faculty, phenomenological, COVID-19, online, mathematics, higher education
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CHAPTER I: INTRODUCTION

Background

The COVID-19 pandemic disrupted the learning of about 1.6 billion students in over 190 countries worldwide (United Nations, 2020). It was the most significant disruption of education in history, affecting students and teachers worldwide. The World Economic Forum described the coronavirus as a "catalyst for educational institutions worldwide to search for innovative solutions in a relatively short period of time" (Tam & El-Azar, 2020, p. 1). The pandemic hit the United States with about five weeks left in the traditional Spring 2020 semester related to higher education. The government asked people to stay home. After the lockdowns, social distancing and face masks became the new normal to keep people safe and mitigate the virus's spread. The COVID-19 pandemic forced colleges and universities to adapt student learning in an environment where people could not be physically together. In response, institutions transformed instruction by canceling on-campus courses and moving classes online with only weeks to make it happen. The pandemic caused institutions to alter operations. Changes occurred in admissions, student support services, advising, student development, housing, food service, and nearly every department. All had to shift to remote home-based operations. In addition, the changes brought instability to enrollment and uncertainty in the financial future, including unexpected costs and reductions in revenue (Smalley, 2020).

The Spring semester of 2020 had over 1,300 higher education institutions in the United States transition to online learning (The College Crisis Initiative @Davison College, 2021). Faculty and staff transitioned to work from home, many institutions implemented hiring freezes, and some had layoffs and furloughs. During the Fall 2020 semester, many colleges offered a mix of socially distanced in-person classes and online learning. According to Davidson College's
Crisis Initiative (C2i) data, about 44% of colleges and universities were either fully online or primarily online instruction, 21% created hybrid instruction, and 27% had entirely or primarily in-person classes. By the Spring 2021 semester, plans were like the Fall semester, with about 25% of institutions offering in-person sections and about 43% still fully or primarily online (College Crisis Initiative, 2021). The numbers indicate the transition to online courses was significant. The daunting reality was most faculty had only a week to adapt their traditional face-to-face classes to some form of remote instruction during the initial rapid transition. The shift brought challenges as many faculty members had not taught online and were unfamiliar with the technology and tools to create an online course. Once the rapid transition passed, the faculty had more time to plan for the Fall 2020 semester. For a year and a half, most faculty taught from their homes, physically isolated from their students, peers, and department.

The spark for this study was the combination of the explosive growth in online teaching coupled with research indicating that online courses have low success rates (Fital-Akelbek & Akelbek, 2011; Huston & Minton, 2016). This study explored the phenomena of faculty’s lived experience through the COVID-19 pandemic’s rapid transition to online learning. The study used a phenomenological design to illuminate meaning framed with a conceptual reform model.

**Problem Statement**

The success rates for online math courses need to improve, indicating that more research in this area is necessary. The COVID-19 pandemic sparked an unusual situation, with almost all on-campus classes forced online mid-semester. Suddenly faculty's in-person courses, the only format many of them had known, stopped. All faculty were unexpectedly asked to teach online using unfamiliar tools such as a Learning Management System (LMS) and Zoom. With little to no experience creating and teaching an online course, math faculty suddenly had to adapt their
on-campus classes into online courses with short notice. To further complicate, some of these faculty had previously been resistant to teaching online and had no experience with this instructional modality. The faculty also lacked the time that would have usually been available to prepare for this transition.

**Purpose Statement**

This study explored how faculty at a state college experienced the COVID-19 transition, applying a conceptual reform model with a qualitative phenomenological approach. The approach explored faculty perceptions to understand the phenomena better. The conceptual framework, the Teacher-Centered Systemic Reform (TCSR) model (Gess-Newsome et al., 2003), guided the study in four areas: personal factors, contextual factors of structure and college culture, teacher thinking, and teachers’ practice. The study results fill the gap in the literature regarding how mathematics faculty experienced the rapid transition. Faculty are the primary influencers at a college, and their perspectives on the value and challenges of online learning programs may determine a college's future direction. By understanding the faculty experience, the challenges, and barriers to online instruction, administrators and educational leaders may improve the college department's (faculty, staff, administration) reactions to future course interruptions and ultimately enhance teaching and learning during a crisis.

**Significance Statement**

This study was significant because the COVID-19 pandemic created a historic shift in instructional modality (United Nations, 2020); understanding this shift from faculty experiences is substantial (Johnson et al., 2020). There was value in understanding the faculty experience to better support future reforms in instructional practices (Rupnow et al., 2020). The study provided insight into faculty views of teaching and students during the immediate transition and the period
of remote learning that followed. The study revealed how faculty changed their teaching practices, what instructional practices were successful, what practices they discontinued, and the role of learning new technology. In addition, the study revealed future instructional plans as faculty transitioned back to on-campus instruction.

There was little to no research on the lived experiences of mathematics faculty in their rapid transition to online learning. This study filled this gap by exploring the rapid shift in the timeframe of the COVID-19 pandemic. Two research studies from the first few weeks of the spring pandemic found that faculty experienced stress and anxiety and often had to readjust their expectations and remain flexible during the emergency transition (Marek et al., 2021; Muller et al., 2021). Marek and colleagues (2021) and Muller and colleagues (2021) surveyed faculty in Asia and Singapore, and the current study explored participants in the United States, which adds to the literature. Marek and colleagues recommended future research in collecting data on faculty experiences beyond the initial transition phase. This phenomenological study did that. An empirical survey of US faculty experiences in the early weeks of the pandemic indicated what the faculty did (Johnson et al., 2020); however, the study does not describe the lived experiences of how the faculty responded. This study added to this gap in the research. Recently, Rupnow and colleagues (2020) studied Chemistry faculty experiences during the COVID-19 shift in instruction at a research university. Rupnow’s study (a) confirmed the value of understanding current faculty beliefs and teaching practices to plan reform and (b) recommended future research within other departments that "may help to spark change" (Rupnow et al., 2020, p. 2406). This study added to Rupnow and colleagues’ recommendation and expanded the knowledge from the perspective of mathematic faculty at a state college.
Definition of Terms

This section defines the terms used throughout the research study.

Asynchronous online course: A distance-learning course where learning occurs at different times and spaces. The content is available online for students to access when it fits their schedule with assignments completed by specific due dates. The students and instructor have no required real-time virtual or on-campus interactions. The instruction occurs in a Learning Management System (LMS), often through instructional videos.

Blended online or mixed-mode course: A class with both asynchronous online work and an on-campus regularly scheduled meeting.

Canvas: Canvas is a web-based Learning Management System (LMS).

Course completion rate: The number of students who completed a course earning an overall grade of an A, B, C, D, or F. It does not include the students that withdrew before the end of the course.

Learning Management System (LMS): A LMS is a software application used to organize and distribute e-learning materials, assignments, and assessments; track and calculate grades; and facilitate communication among students and teachers (https://dictionary.com).

On-campus instruction or In-person instruction: A course where the instructor and students meet in person in a physical classroom.

Rapid online learning: From March 2020 to April 2020, faculty were required to do an emergency shift of on-campus courses to remote education.

Student success rates: The student success rate is the percentage of students that have earned a passing grade in a course. The students who achieved an A, B, or C were divided by the total number of students with a grade of A, B, C, D, F, W (withdrawal), and I (incomplete).
**Synchronous online course:** A synchronous online course is an online-learning course in real-time communication with required virtual meetings. In addition to the live class sessions, students complete assignments online through an LMS.

**Conceptual Framework**

The study used the Teacher-Centered Systemic Reform (TCSR) model, developed by Woodbury and Gess-Newsome (2002) and adapted for higher education by Gess-Newsome and colleagues (2003). The TCSR model (Figure 1) depicts a framework for understanding the complexity of educational reform.

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Figure 1: The Teacher-Centered Systemic Reform model for a college classroom

[https://doi.org/10.3102/00283120400003731](https://doi.org/10.3102/00283120400003731) Copyright 2003 by SAGE Publications.
The TCSR model describes three contextual factors: (a) personal-contextual factors, (b) structure and culture, and (c) teachers' thinking, and how these mutually influence (d) teachers' practice in a reform initiative. The interplay among the factors ultimately affects the instructors' actions in the classroom or online. The following section describes each of the model's four factors.

First, personal-contextual factors are the life experiences that each teacher brings to their practice, such as education, work experience, demographics, and background (Gess-Newsome et al., 2003). These factors influence teacher thinking, practice, and the instructor's participation in reform-based initiatives. This study included a) whether the instructors had taught online pre-COVID and how long, b) the nature and extent of teachers' preparation to teach online c) and the extent of teachers’ continued learning or professional development. The study addressed these areas in the pre-interview demographics survey and the interviews.

Next, contextual factors of structure and culture (Figure 1) included technology, teaching materials such as textbooks, assessments, and the culture of the department and school. The department's culture could consist of norms of interaction, types of communication, people, and behavior expectations. For example, faculty collaboration and faculty collaboration with the administration are considered part of an institution's culture. Also, a culture of care for students and colleagues is a contextual factor. Factors of the structure are physical location, schedules, class load, and class size. The contextual factors influence teachers' thinking and practice (Gess-Newsome et al., 2003). An example is an instructor who may have many years of on-campus teaching experience but no online teaching experience. Another example is whether an instructor participated in any teacher development for teaching online.
The third category highlighted in the TCSR model was teacher thinking, which included teachers' knowledge and beliefs about: change, students, learning, teaching, teaching roles, schooling, schools, and the content taught (Gess-Newsome et al., 2003). A teacher's view may be that lecturing is the best teaching method, or another may feel the opposite in that active learning is the best method (Rupnow et al., 2020). The TCSR model placed teacher thinking in the center, which "suggests that school change is ultimately about teacher change" (Woodbury & Gess-Newsome, 2002, p. 774). The fourth area mutually influenced by personal, structural, cultural, and teacher thinking is teachers’ practices implemented in the course. Some teachers' practices are whether the instructor was a facilitator or lecturer, used technology or not, had the class work in small groups, or employed active learning.

The Teacher-Centered Systemic Reform (TCSR) model provides a framework for developing new reform initiatives and evaluating outcomes. The TCSR model was initially applied to research on high school mathematics education reform (Woodbury & Gess-Newsome, 2002) and was later used in higher education STEM reform (Gibbons et al., 2018; Lund & Stains, 2015). Gibbons and colleagues (2018) performed an empirical study that surveyed over a thousand chemistry faculty. Their results supported the TCSR model's link between teacher thinking and "enacted instructional practices" (p.1116).

In 2020, the TCSR framework was used as a model for chemistry faculty responses to the initial COVID-19 shift to remote learning (Rupnow et al., 2020). The researchers posited that the framework applies to faculty experiences as the rapid shift to online teaching was an abrupt change to instructors' teaching practices. Using the model, the forced changes in teaching practice simultaneously have influenced personal factors, contextual factors of structure, and teacher thinking, leading to reform (Rupnow et al., 2020). This study furthered current research
by applying the model to understanding mathematics faculty experience through the COVID-19 pandemic at a state college.

**Research Questions**

One research question with two subcomponents was used to explore the perceptions of mathematics faculty through the COVID-19 pandemic and provided a deeper understanding of the experience.

1. What were the experiences of mathematics faculty during the rapid transition to online instruction due to the global COVID-19 pandemic?
   a. What were the challenges faculty experienced, if any, in preparing for and then teaching online in the forced modality change from on-campus to online?
   b. How do faculty describe changes to their teaching practice, if any, due to the forced transition during the global pandemic?

**Limitation**

A limitation is that all students and faculty were forced to transition to an online environment. Some faculty were already teaching online, and some were not. Faculty that were already teaching online had an advantage in the transition. This may impact how the participants experienced educational and pedagogical changes.

**Delimitation**

The delimitations used by the researcher were determined by the desire to understand the rapid instructional shift from mathematics faculty members' points of view at a state college. The researcher chose full-time tenured and tenure-track faculty from multiple campus locations at one state college. Faculty were selected based on previous online teaching experience. Faculty
with three skill levels (no knowledge, some experience, and extensive experience) were chosen to mirror the skill level at the college.

**Assumptions**

This study assumed (a) the selected faculty responded to the interview questions truthfully, sharing their experiences in the rapid transition to online teaching; (b) the selected faculty recalled their lived experiences from the past year and a half, and (c) the thematic analysis accurately represented the interview data.

**Organization**

There are five chapters in this research study. Chapter I provided the background, problem statement, purpose statement, significance, key terms, conceptual framework, and research questions. The chapter also included limitations, delimitations, and research assumptions.

Chapter II is a literature review that includes a brief history of distance education and theories in online learning. Chapter III describes the methodology used for the research, which consisted of the participant selection, interview protocol, and data analysis process.

Chapter IV presents the research data, including the coding process, participant information, and a profile of each participant. The data is presented through contextualized categories, and deep themes emerge from the categories. Next, the data is aligned with the conceptual framework. Lastly, Chapter V discusses the results related to the literature, implications, and recommendations for future research.
CHAPTER II: LITERATURE REVIEW

This literature review begins with a brief history of distance education, online learning theories including presence and scaffolding, success rates in online courses, and then presents literature on the faculty experience and research on best practices in the online environment. The review includes research regarding online faculty perceptions and strategies to improve the online sense of community and communication. It then delves into recommendations for instructor professional development emphasizing the transition from on-campus to online.

History of Distance Education

Distance education started in the early 1700s with correspondence through the mail. An advertisement in the Boston Gazette in 1728 is the first evidence of distance learning. The Gazette stated, "Caleb Phillips Teacher of the new method of Short Hand" was looking for "Persons in the Country desirous to Learn this Art, May by having the several Lessons sent Weekly to them, be as perfectly instructed as those that live in Boston" (Battenberg, 1971, p. 44). It is unknown if this shorthand course required students to mail information back to the instructor for feedback.

In the 1800s, there was more evidence of early attempts at distance education. An Englishman named Isaac Pitman taught shorthand on postcards. He had his students transcribe passages from the Bible using shorthand. The students would then mail him the postcards for correction. Pitman's course was the first known evidence of an instructor providing student feedback from a distance (Light, 1956). Isaac Pittman managed the shorthand correspondence from 1840 to 1843 until he created the Phonographic Correspondence Society. This society became the Isaac Pittman Correspondence College (Light, 1956). Correspondence education continued to grow in the 1800s with some exciting developments. In 1873, the daughter of a
Harvard professor, Anna Eliot Ticknor, founded a correspondence school in Boston, Massachusetts. The school, known as the Society to Encourage Study at Home, used correspondence of guided readings, letters, and tests to cover "classical" content. The students were primarily women restricted from higher education (Mathieson, 1971). Soon after, in 1892, the University of Chicago became one of the first higher education institutes to offer successful correspondence courses (Holmberg, 2005). The University of Chicago enrolled 3,000 students in over 300 classes with over 120 instructors (Rumble, 1986). Early distance learning was complex because students could not ask the instructor questions promptly and could not interact with other students.

In the first half of the 1900s, numerous new inventions such as the radio and television, led to innovations in distance education (Kentnor, 2015). In 1919, the University of Wisconsin started the first licensed radio station for educational broadcasting (Kentnor, 2015). Thirty years later, television broadcast was a reality, but limits on television broadcast licenses caused slow growth in educational uses. License issues caused problems, but the students also experienced poorly produced courses where an instructor would just read notes, making it difficult for students to pay attention (Koenig & Hill, 1967). At this time, student-teacher communication was primarily limited to phone calls. In 1971, the creation of the microprocessor by the Intel Corporation led to the development of more sophisticated computers and electronic mail (Intel Museum, 2006).

**The Internet and Online Education**

The invention of the Internet and the World Wide Web in 1991 allowed computers to link together, and distance education grew (Casey, 2008). The new technology led to the term *online education*. Online education does not have one set of agreed-upon definitions. In general, online
education uses the Internet and computers to deliver course content that enhances the interaction between teacher and student (Singh & Thurman, 2019). The University of Phoenix was one of the first to offer online education courses, with many non-profit colleges and universities joining afterward (Carlson & Carnevale, 2001). In 1995, the first web-based Learning Management System (LMS) called WebCT was developed to organize the structure of an online course. An LMS provides a place for instructional content like notes and videos, assignments, quizzes, discussions, a gradebook, and a communication tool (https://dictionary.com). People often interchange distance education, online education, and online learning. New technologies develop, and new terms like e-learning and blended education have emerged to describe new methods (Miller et al., 2016). By the late 1990s, online education was a valued part of higher education and helped many colleges meet enrollment demands (Keegan, 1996). Technology advanced during this time, resulting in videoconferencing, mobile telephones, virtual satellite classrooms, and the Internet (Keegan, 1996).

Originally, distance education was about educating students who lived far from the instruction; it developed for those who physically could not attend, offering needed accessibility (Battenberg, 1971). Today, a student may live near a college but choose to take an online course for convenience due to family or work obligations or personal preference.

Online education has faced controversy regarding the quality of the courses and faculty buy-in (Kentnor, 2015). In the past, not all college and university faculty embraced the idea of online education due to concerns about quality (Shelton & Saltsman, 2005). Without the full support of faculty, some online programs were discontinued (Carlson & Carnevale, 2001). Some faculty did not understand the difference between online pedagogy and online learning styles compared to traditional classes (Kentnor, 2015). A lack of understanding contributed to poor
quality, with professors providing lecture notes and textbook pages for students to read from traditional classes thinking that was all that was needed (Kentnor, 2015). This lack of understanding and faculty buy-in lend to the current study that sought to understand the faculty experience in the forced transition from in-person to online.

Currently, connectivity and the digital divide are problems low socioeconomic students and some technology-resistant faculty face (Cullen, 2001). The digital divide is the gap between those with high-speed internet-enabled devices and those without. For example, a student with multiple computers in their home and access to high-speed broadband may have more success learning online than someone who has had to share a computer with various family members or only has dial-up internet (https://soeonline.american.edu/blog/digital-divide-in-education). During the COVID-19 pandemic, internet access for many may have been closed. For example, students that used the Internet at a local library or within their apartment complex community room found these locations closed. They may have had to compete with siblings and parents at home accessing a shared computer. Students in rural areas of the country may have less opportunity for high-speed internet than those who live in cities, as the infrastructure has yet to reach their community. In addition, faculty members who are not trained or were resistant to technology may have experienced a challenge bridging the divide required for online teaching. The faculty experience, including technology views, provided credence for exploration in this study.

Methods of Delivery

Today, online courses have three primary modalities: asynchronous, synchronous, and a blended form of both asynchronous and synchronous learning. Asynchronous learning occurs when teachers and students do not meet on a specific day or time. The learning occurs in a
course that the instructor or an instructional designer has created using a Learning Management
System (LMS). The course content often includes instructional videos, a communication or
messaging system, assignments, a gradebook, and a discussion board area for students and
teachers to interact. The teacher provides feedback on assignments and regularly schedules
formative and summative assessments (Adams, 2016). Asynchronous learning has been the
traditional method for most online courses (Watts, 2016). The asynchronous model allows students
the time for more thoughtful reflection in discussion board posts (Watts, 2016). The disadvantages
are the missing element of seeing facial expressions, live interaction, and instantaneous feedback
(Watts, 2016).

A blended learning course requires on-campus meetings and asynchronous or
synchronous online work. Synchronous courses meet virtually on specific days and times. The
virtual meetings occur through the Internet using a computer with a web camera and video
conferencing software, such as Zoom, Skype, Google Hangouts, and Microsoft Teams. A
synchronous course provides students the advantage of seeing and interacting with their
classmates and instructor, immediate feedback, and feeling less isolated (Watts, 2016).
Disadvantages include a loss of convenience for the student and professor due to the set meeting
days and times (Watts, 2016).

Theories in Online Learning

Over the years, researchers have developed and refined theories for teaching and learning
in an online environment. This section discussed presence and cognitive scaffolding theories,
including researched-based applications. Both approaches emphasize how faculty can better
engage and support online learners in the distance learning process and improve the course
quality (Doo et al., 2020; Quaye et al., 2019).
Developing Presence

Developing a sense of presence is vital for students to feel engaged and for learning to occur. Without it, students may drop out (Bean & Metzner, 1985; Tinto, 1975; Rovai, 2002). A sense of presence develops through relationship building between the students and faculty within the online course. Multiple research studies have found that satisfaction with a course improved with an increased quantity and quality of interactions (Hartman & Truman-Davis, 2001; Picciano, 2002).

Garrison, Anderson, and Archer (1999) developed a model for online learning based on three types of presence, cognitive, social, and teaching (Appendix A). The three types of presence create a Community of Inquiry (COI) for the online learning experience. Researchers have used the COI model extensively for course development and teaching research (Anderson, 2017).

Cognitive presence is "the extent to which the participants in any particular configuration of a community of inquiry can construct meaning through sustained communication" (Garrison et al., 1999, p. 89). Learners use critical thinking to construct knowledge toward the course learning outcomes. In an asynchronous online environment, critical inquiry develops through online discussions where students post their responses and reply to other students. Critical thinking and cognitive presence occur during the live sessions in a synchronous environment.

Social presence is "the ability of participants in the Community of Inquiry to project their characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (Garrison et al., 1999, p. 89). A social presence is crucial in supporting the cognitive presence demonstrated through shared critical thinking and relationship building amongst the students and faculty. As learners contribute to a discussion, they build trust in
sharing their views, leading to a greater sense of community (Quaye et al., 2019; Trespalacios & Uribe-Florez, 2020). An assignment where the instructor and students introduce themselves and get to know each other is an example of building a social presence in an online course.

Teacher presence is the third area in the Community of Inquiry model (COI). Garrison and Archer (2000) described teacher presence as the idea that students need to feel their teacher's presence in the online course. This presence develops through online interaction and communication. The teacher is the facilitator of the exchanges, which form the cognitive and social presence of the course. The instructor is responsible for setting clear goals and learning outcomes, including designing the curriculum, instructional methods, schedule, due dates, and assessments. In addition, students feel their teacher's presence in activities, such as interactive discussion postings, weekly announcements, and personal feedback on assignments (Garrison & Archer, 2000).

**Instructional Scaffolding**

Many students begin an online course lacking the necessary skills in time management, technology competency, and information literacy (Rovai, 2002). Some students may lack the prerequisite knowledge and need support learning new content and navigating the online environment (Rovai, 2002). Instructional scaffolding supports online students' diverse learning needs (Quaye et al., 2019, Trespalacios & Uribe-Florez, 2020).

The theory of instructional scaffolding developed from Vygotsky's (1980) sociocultural theory and Zone of Proximal Development (ZPD). Vygotsky's sociocultural theory states the importance of teachers understanding that students develop through social and cultural contexts (Quaye et al., 2019). Vygotsky (1980) defined the zone of proximal development as: "The distance between the actual developmental level as determined by independent problem-solving
and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (p. 86). Instructional scaffolding is a teaching method used to close the distance between what students can do independently and what they can do with assistance from an instructor or knowledgeable peer (Quaye et al., 2019). The idea is to set up a scaffold to support student learning and then, over time, remove the platform as the student reaches independent learning (Palinscar, 1986).

Hannafin, Land, and Oliver (1999) divided the types of scaffolding into four categories: (a) procedural scaffolding helps students use tools and resources for learning, such as an orientation to the course; (b) conceptual scaffolding helps students identify vital concepts; (c) strategic scaffolding provides ways of identifying and evaluating various approaches; (d) meta-cognitive scaffolding helps students reflect on the learning. Several meta-analysis studies on scaffolding in an online environment confirmed the four categories and found that meta-cognitive scaffolding is considered the most effective method in improving learning outcomes in the online environment (Doo et al., 2020; Jumaat & Tasir, 2014). The following section discusses practical methods for implementing the theoretical ideas of scaffolding instruction.

Stravredes (2011) provided practical methods for faculty scaffolding the online environment. The items included a course overview that lists the necessary assignments and due dates, learning modules with introductions and checklists, grading rubrics, and self-reflection activities. Procedural scaffolding guides students as they learn how to navigate the online course, with resources such as an orientation module, video introduction, or online orientation. Also, Stravredes (2011) recommended outlines, study guides, and guiding questions as examples of conceptual scaffolding that help students identify key concepts and strategic scaffolding such as support through individual feedback.
Success Rates in Online Courses

The Community College Research Center (2020) has multiple studies that indicated pre-COVID-19 completion rates in online courses were 8 to 12 percentage points lower than those in on-campus classes (Jaggars & Xu, 2010; Xu & Jaggars, 2011; Xu & Xu, 2019). This trend was especially true in mathematics courses. Two different studies in the Washington Community College System and the other in the Virginia College System investigated student outcomes in online, blended, and face-to-face courses. Both studies covered five years (pre-COVID-19) and found that students were likelier to fail or withdraw from online courses than face-to-face ones. In addition, students that took online courses early in their coursework were less likely to return to school, and those that took a higher number of online classes were less likely to complete the degree or transfer to a four-year college (Jaggars & Xu, 2010; Xu & Jaggars, 2011). This trend indicates that further research is needed to understand and work toward a remedy.

Some research studies indicate college mathematics classes’ online course success rates (grades of A, B, or C) are typically lower than in traditional in-person courses (Fital-Akelbek & Akelbek, 2011; Huston & Minton, 2016; Zavarella & Ignash, 2009). Huston and Minton (2016) examined course completion rates for the entry-level intermediate algebra course and found a significant difference in the different modalities. Online sections had a significantly lower course completion rate than on-campus sections. These findings indicate the need for more research on improving online education, especially in mathematics at open-access colleges. This study addressed the condition as it sought to understand the faculty experience at an open-access state college.

The issue of low success rates and subsequent low retention rates in online courses was significant for college faculty and administration. The Pew Research Center (Fry & Cilluffo,
2019) found that the overall number of undergraduates at US colleges had significantly increased over the past 20 years. The growth was mainly from low-income families and students of color attending two-year and low-selective four-year colleges. The enrollment change, mixed with the current COVID-19 pandemic, has dramatically increased the number of online courses. Online courses help fulfill the demand for flexible schedules, locations, and accessibility (Ross-Gordon, 2011). In addition, online courses protect students' health and safety due to the COVID-19 virus. While the need for online classes is here to stay, Jaggars and Bailey (2010) cautioned that online learning might slow the progress of low-income and underprepared students, especially if there is no support from faculty or peer engagement. More research is needed to understand how the COVID-19 shift to online learning has affected how faculty support students.

**Best Practices for Online Teaching and Learning**

This section provides an overview of the literature on best practices for online courses. Many researchers have established best practices in the pedagogy and technology for online classes (Chen et al., 2018; Khan et al., 2017; Kumar et al., 2019; Tanis, 2020). These include timely feedback, clear guidelines and expectations, developing instructor presence, clear communication, scaffolding concepts, and multiple types of content (videos, notes, e-books, and integrated homework platforms). Considering this list, Chen and colleagues (2018) determined what students perceived as practical design elements for online Science, Technology, Engineering, and Math (STEM) courses. Chen and colleagues (2018) surveyed over 500 students from 15 asynchronous online STEM courses. They found that students' sense of learning and satisfaction with knowledge related to their perceptions of the efficacy of specific course elements. The course elements were active learning activities, interactive assignments, and assessment design. Active learning included real-world problems, special software, and case
Active learning refers to "classroom practices that engage students in activities, such as reading, writing, discussion, or problem-solving, that promote higher-order thinking" (Conference Board of the Mathematical Sciences, 2016, p. 1). Active learning is facilitated through a student-centered approach compared to the teacher-centered lecture approach. In addition, Chen and colleagues (2018) recommended the need for consistent instructions regarding assignments, assessments, and due dates. The study was vital because it advised engaging students with active experiences and real-life problems. Additionally, the researchers have posited that STEM instructors should provide opportunities for online students to collaborate with other students and teaching assistants, which builds presence and community. Lastly, the study supports using Universal Design for Learning (UDL) principles in designing an online course (Chen et al., 2018).

Universal Design for Learning (UDL) "allows students with disabilities to access courses without adaptation, and also allows the coursework to be available in a variety of formats for the non-disabled, making it easier for everyone to access" (Dell et al., 2015). The University of Arkansas created a list of practical elements to build into an online course, *Ten Steps Toward Universal Design of Online Courses* (n.d.). The steps provide a guideline for faculty as they create their online courses. The elements to "enhance access and usability" are:

- include a welcoming access statement
- provide simple, consistent navigation
- choose tools carefully
- model and teach good discussion board etiquette
- use color with care
- make sure the text is readable
- provide accessible document formats
- describe graphics and visual elements
- caption videos and transcribe audio clips
• rethink, redesign PowerPoint presentations

As technology improves, online course design and implementation practices will continue to evolve. The digital nature of online learning provides new ways to support diverse student needs and remove learning barriers (Dell et al., 2015).

**Communication Online**

Chen, Bastedo, and Howard (2018) surveyed 537 students from 15 online STEM courses to gather student perceptions on learning and course design. The results indicated students wanted professors to offer more online video resources, send reminders, provide face-to-face opportunities to meet with their instructors and teaching assistants, and collaborate with peers. Also, students welcomed projects that apply real-world problems and include a clear explanation and short practice quizzes as they see this to improve their grades. Chen and colleagues (2018) found faculty should enhance communication with students through "clear, concise and consistent instructions, assignments, assessments, [and] due dates" (p.68).

Parker (2012) explored student perceptions of online communication, including communication tools, retention, and comparing communication in online versus in-person classes. In addition, Parker (2012) determined that students and faculty mostly communicate in written form through email, discussion postings, and lecture notes. Less contact occurred with teacher-created videos and in live conversations. The researcher found a strong correlation existed between course satisfaction and communication level. The more present the teacher seemed in the course, the more satisfied the student. Communication barriers included slow responses and a lack of answers. These barriers decreased motivation. Parker (2012) recommended that faculty apply various communication tools besides email and discussion,
including instructor-created videos and notes, and offer live office hours. Lastly, faculty should hold virtual office hours convenient for students (Parker, 2012; Gibbons-Kunka, 2017).

Gibbons-Kunka (2017) completed a qualitative study that investigated virtual office hours. The research presented the benefits and challenges of adding synchronous office hours to an asynchronous course. The student participants found that virtual office hours helped decrease the transactional distance between professors and students. The challenges were student participation, as some students did not participate due to conflicting work schedules and others were unwilling to make the extra effort. Gibbons-Kunka (2017) recommended future research on whether regular participation in synchronous office hours improved student success. The current study considers the change to and use of virtual office hours due to the pandemic.

Recently, Kumar and colleagues (2019) interviewed award-winning online instructors for their advice on course design. They identified five necessary course elements (1) relevant course materials that connect to practice, (2) the use of multimedia resources, (3) student creation of digital content individually and collaboratively, (4) students' reflection on learning, and (5) the instructor's explanation of the purpose of activities, technologies, and assessments in the online course. The area that stands out is collaboration, the idea of students working collaboratively, which builds a sense of classroom community and connectedness. In addition, Kumar and colleagues (2019) found award-winning instructors recommended the importance of formatively assessing students and using the data to make changes. This lends significance to the current study, which explored how faculty experienced the loss of proctored testing due to the closed campus testing center.

Kumar and colleagues (2019) created a comparison of expert and novice online instructors, shown in Table 1. The idea is that an instructor may have many years of in-person
teaching experience, but if they are new to teaching in the online modality, they would be considered a novice.

Table 1

Expert and Novice Online Instructors

<table>
<thead>
<tr>
<th>Expert instructors</th>
<th>Novice instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Know what works in the online format</td>
<td>• Focus on getting the course on the LMS</td>
</tr>
<tr>
<td>• Possess a wide range of strategies</td>
<td>• Are overwhelmed with the time online teaching takes</td>
</tr>
<tr>
<td>• Have confidence in online teaching</td>
<td>• Need support on course design</td>
</tr>
<tr>
<td>• Are able to identify problems</td>
<td>• Are not comfortable with adapting materials for an online format</td>
</tr>
<tr>
<td>• Are not limited by technology</td>
<td>• Have subject-matter expertise but fall short of design</td>
</tr>
<tr>
<td>• Know how to adapt materials for an online format</td>
<td></td>
</tr>
<tr>
<td>• Choose content and activities carefully</td>
<td></td>
</tr>
<tr>
<td>• Constantly monitor, tweak and evaluate the course</td>
<td></td>
</tr>
</tbody>
</table>

Note: From "Award-Winning Faculty Online Teaching Practices: Elements of Award-Winning Courses" by S. Kumar, F. Martin, K. Budhrani, and A. Ritzhaupt, A., 2019, *Online Learning*, 23(4), 172 https://doi.org/10.24059/olj.v23i4.2077 License https://creativecommons.org/licenses/by/4.0/

Table 1 indicated that novice instructors are uncomfortable adapting materials, may be overwhelmed with extra time required to teach online and may need support on course design.

*Math Best Practices*

Matika (2012) studied student and instructor perceptions of success in online and in-person algebra classes to improve online course success rates. His research recommended improvement in instructor-student communication and student *self-efficacy* behaviors. Self-efficacy is a student's belief in performing behaviors necessary to produce specific results (Bandura, 1997). Students with low self-efficacy (students who doubt their ability to be successful) may enroll in online courses to hide in the anonymity of the online setting (Matika, 2012).
Fital-Akelbek and Akelbek (2011) found an improvement in online algebra success rates attributed to improved faculty-student communication using recorded lectures and timely feedback on assignments. Mayhew (2016) agreed that communication is essential, "the mode of content delivery seems less important than the way content is being delivered; through quality in-course interactions with peers and faculty" (p. 595). Harrel (2008) examined three areas that positively impacted online student success: student readiness, course orientation, and student support. Most community colleges have open enrollment, so mandating an online readiness assessment or orientation becomes challenging.

**Sense of Community**

In education, "community" represents a relational group of people, not a specific geographical space such as a town or city where people gather. People come together over a shared interest or goal in a relational group, and the people may or not be geographically close (Arasaratnam-Smith & Northcote, 2017). In an often-cited early work, McMillian and Chavis (1986) defined a community as a group where members feel a sense of belonging. Each member has value, influence, and the ability to support the others. The members receive a sense of fulfillment or emotional support from each other. A student can feel help from their peers as well as the teacher. A student can sense the social presence of the teacher even though the instructor is not physically in the same space (McMillian & Chavis, 1986).

**Faculty Perceptions of Community**

Overall, higher education faculty believe that students' sense of community and faculty presence is essential for student engagement (Berry, 2019b; Bolliger et al., 2019; McGuire, 2016). Berry (2019b) recently identified four strategies faculty use to build a sense of community in online synchronous classes. The strategies include reducing lecture time, frequently sending
messages and emails to students, engaging students with video and chat, and using some class
time for social networking. The importance of emailing and messaging students often was a
reoccurring theme (Berry, 2019b; Dawson, 2006); however, Garrison and Cleveland-Innes
(2005) found that "simple interaction, absent of structure and leadership, is not enough" (p. 145).
The study recognized the need for a broader, "richer" view of online interaction. The course
design should have clear expectations and manageable content with appropriate collaborative
and individual activities. In addition, the instructor should provide engaging questions with
focused discussions and model the contributions (Garrison & Cleveland-Innes, 2005). This
study investigated the faculty experience of creating a sense of online community in the forced
transition to online instruction.

One study found that faculty were reluctant to use class time for community building
(Berry, 2019a). Berry (2019a) used a qualitative case study to analyze faculty perspectives in
creating community in a synchronous online doctorate program. The study found that faculty
believe that the role in cultivating community is limited to the classroom. The study explored
faculty participation outside the classroom, such as college events, advising clubs, etc. The
researchers found many faculty did not have time or a desire to attend college events. Further
research could explore faculty reluctance to give up class time to support a sense of community.

Given the importance of instructor presence and classroom community, some research
has attempted to identify strategies to improve instructor presence in an online course. For
example, McGuire (2016) found the following designs create instructor presence in online
learning: introductions that include a photograph or video to help "humanize the course" (p.62),
timely personal feedback, clear expectations, and instructor participation in student discussions.
Thus far, the literature review has explored online learning course success and faculty perceptions to improve the online community. Next is an examination of research on barriers to the community and faculty preparation for online teaching.

**Barriers to Community**

Although many studies recommend best practices in course design to increase student interactions to build an online community, not all students may agree. Some studies have suggested that online student interaction may not be that useful for learning and are less valued by students than teachers (Lapointe & Reisetter, 2008; Peters, 2003). Lapointe and Reisetter (2008) surveyed graduate students taking online courses to determine their sense of value and commitment to an online learning community. Some students felt the virtual community was beneficial to their learning and others felt differently. Some felt the online community was "superfluous," "inconvenient," and "not supportive of their learning processes" (p. 641). Their findings on the role of online peer connections led to two different student groups. One group strongly valued the online learning community and felt the peer interaction was sufficient and met their expectations. The second group of students enjoyed the online course’s independence and minimized the value of peer interactions. Some of these students viewed the interactions as a course requirement necessary to get a good grade. Outside the classroom, factors may influence students' value of online peer interactions, such as time constraints, personality factors, family and work responsibilities, and course content (Reisetter et al., 2007).

Multiple studies have used the Classroom Community Scale to understand better students' sense of community, connectedness, and the feeling of learning (Dawson, 2006; Lin & Gao, 2020). First, Dawson (2006) examined the frequency and type of communication students used in a virtual classroom and how it related to the students' measure of sense of community.
Using a sample of 464 undergraduate and graduate students in education courses, Dawson (2006) found that the greater the student frequency of communication in a class, the greater the student's sense of community. The communication included email, phone, forum posts, chat sessions, face-to-face, and text messaging. Students that interacted more indicated a more incredible feeling of the classroom community. Many studies surveyed and interviewed faculty to learn their perceptions, adding to the literature on professional development.

**Faculty Professional Development for Online Instruction**

The faculty's perceptions of online instructional practices are essential in the online environment. Olcott and Wright's (1995) seminal work found that for faculty to use new technology tools and methods, the faculty must perceive that the quality and availability of training are positive. In a more recent study, Philipsen and colleagues (2019) conducted a meta-aggregative review that examined the research from 15 articles on improving professional development for online and blended learning. Their work resulted in six findings that make up good online professional development. First, professional development should support the teacher through the process, including feedback, being well organized, and having a reasonable length. Second, the program needs to contextualize the content to the faculty environment to promote connection and have leadership support in funding the program and acknowledging the time commitment. The third element addresses the teacher change associated with the transition from on-campus to online. The transition to online learning will affect "teachers' self-perception" and "professional identity" (Philipsen et al., 2019, p.1157). The professional development course should address the change in the transition to online learning regarding professional identity and educational beliefs. The identity and beliefs tie back to this study’s theoretical framework:
TCSR. Professional development is a contextual factor of structure and culture that mutually influences teacher thinking and practice. See Figure 1 in Chapter I, Conceptual Framework.

Philipsen and colleagues (2019) fourth and fifth findings include acknowledging professional development strategies associated with the transition to online, including reflection, allowing teachers to practice techniques, and creating a useable portion of a course while providing peer support. Building a part of an online course will build confidence. Lastly, the sixth finding states the importance of contextualizing the professional development of the instructor's college, allowing "teachers to cascade knowledge, skills, and attitudes, and possibly contribute … to their colleagues' learning" (Philipsen, 2019, p. 1162).

Summary

From correspondence courses through the mail to instant feedback through virtual learning over Zoom, education in the online environment continues to advance. Students’ success rates in online modalities pre-COVID-19 performed lower than in on-campus courses, especially in mathematics classes (Huston & Minton, 2016). Much research has been done, and there is more to learn, as technology changes, regarding active learning, online scaffolding assignments, and creating an instructor presence. The COVID-19 pandemic transformed education. Online learning grew dramatically overnight. We must research ways to ultimately understand the faculty experience to improve student learning in online courses. Given that the pandemic sparked a significant change, this qualitative study examined the lived experiences of faculty who taught mathematics through the COVID-19 pandemic. The study focused on the rapid transition from in-person teaching with whiteboard and expo markers to online instructional videos through an LMS. The following section describes the methodology used for the research.
CHAPTER III: METHODOLOGY

Introduction

Chapter III describes the methodology of the research study. The chapter details the rationale for choosing a phenomenological study using Colaizzi’s (1978) data analysis method. The chapter includes the design, setting, selection of participants, instrumentation, data collection, data analysis, and trustworthiness.

Research Questions

One research question with two subcomponents explored the perceptions of mathematics faculty through the COVID-19 pandemic and provided a better understanding of their experience.

1. What were the experiences of mathematics faculty during the rapid transition to online instruction due to the global COVID-19 pandemic?
   a. What were the challenges faculty experienced, if any, in preparing for and then teaching online in the forced modality change from on-campus to online?
   b. How did the faculty describe changes to their teaching practice, if any, due to the forced transition during the global pandemic?

Design and Rationale

The researcher chose a qualitative inquiry and used a descriptive phenomenological method to explore how individuals interpret the world through their lived experiences. Phenomenological research is a method from philosophy and psychology where the researcher identifies the essence of experiences about some phenomena (Giorgi, 2009). The design was founded by the philosopher Edmond Husserl in the 1880s and has been built upon and modified.
by many philosophers (Peoples, 2021). This study used the descriptive phenomenological approach to reveal the deep essence of faculty members' lived experiences during the rapid education transition. According to Moustakas (1994), a phenomenological approach gathers data from participants' narrative stories through interviews which show how they interpret and express their experiences. The method determines what an experience means for the individuals who have had that experience and provides a detailed description of the phenomenon. The researcher chose Colaizzi’s (1978) data analysis method due to the clear and logical steps. The researcher applied, Gess-Newsome and colleagues (2003) higher education reform model, Teacher-Centered Systemic Reform (TCSR), as the theoretical framework to understand the complexity of the phenomena.

**Researcher Role**

The researcher is a mathematics professor at the state college. The researcher's background and education are in engineering and mathematics, so the researcher expanded her learning by applying a philosophical approach through the qualitative study. The college and participants were chosen for convenience and the desire to understand better the lived experience of mathematics faculty throughout the college. The results help understand the rapid transition and apply the knowledge to future reform. The only bias noted is that the researcher knows that many colleagues' course transitions were quick and complex. The researcher does not have a role of authority over the participants but knew some by name through previous college-wide meetings.

**Research Setting**

The selected institution was a public four-year state college that primarily offers Associates in Art and Associates in Science degrees. Located in the southeast United States, the
college has low tuition, open access enrollment, and approximately 70,000 students on multiple campuses. There are about 600 full-time faculty and over 2,000 part-time faculty. For this study, the selected institution will hereafter be called College A.

Participants Selection

The researcher used a purposive sample of nine mathematics faculty that taught during the COVID-19 pandemic. Data saturation was the goal rather than the number of participants (Flick, 2018). A *purposive sample* is "a non-probability sampling strategy in which participants are selected because they are typical of a wider population" (Gray, 2018, p. 771). This sampling method aligns with qualitative research because it aims to gather an information-rich understanding of participants’ experiences within a specific context, timeframe, and location (Creswell & Poth, 2018). Mathematics faculty were selected for three reasons. For convenience and the desire to have participants with similar teaching philosophies and teaching experiences to give consistent results. Previous studies used science faculty (Rupnow et al., 2020), so this study added to the body of knowledge in a different STEM discipline. The participants were selected to mirror the college-wide faculty’s pre-pandemic online teaching skill level. The researcher is a mathematics faculty member at College A and, in that role, asked the math deans and leaders at the different campuses for their recommendations for participants. The criteria were full-time tenured and tenure-track mathematics faculty who had taught for more than two years, with no previous (pre-COVID-19) online teaching experience, some experience, and experts. These choices are intended to reflect the larger population and, in doing so, build plausibility (Gray, 2018). Using the recommendation, the researcher emailed potential participants.
Instrumentation

In this study, the instrumentation was semi-structured interviews with open-ended questions. The instrumentation encouraged reflection and spontaneity in asking about the lived experience (Giorgi, 2009). Two colleagues that were not in the study reviewed the interview questions for clarity and appropriateness. Interviews are the data collection tool for phenomenological research (Creswell & Poth, 2018). As Gray (2018) recommended, the researcher did not use all pre-written questions and prompts during the interview. Some participants needed probing and freedom to expand their answers into new areas.

Data Collection

The data collection process occurred in a two-phase approach. First was the preparation for the study and then phase 2 was the implementation of the interview protocol.

Phase 1

The first step in data collection was obtaining permission from the college's Institutional Review Board. The permission documents are in Appendix B and Appendix C. Next, the researcher emailed an invitation to the selected professors (Appendix D). In preparation, the researcher piloted interview questions on a non-participant and adjusted them before the official interviews. The researcher included conversation prompts like "tell me more" or "could you explain your response more?" to facilitate storytelling (Creswell & Poth, 2018, p. 191). The interview questions (Appendix E), in general, correspond to the conceptual framework emphasizing teacher thinking, teachers' practice, and the personal and contextual factors of structure and culture. Interview questions on challenges included prompts on technology use, course design, pedagogy, timeframe, and how these were experienced. The interview questions focused on the professors' experience recreating their courses for an online modality and the
subsequent online teaching experience after the transition and reflections on returning to the classroom. Three weeks before the scheduled interview, the participants were asked to complete a pre-interview questionnaire that gathered demographic information (Appendix G).

Phase 2

The researcher interviewed each professor in 45 to 60-minute interviews using Zoom with the video and transcript option enabled. The researcher spent the first five minutes of the interview building rapport and discussing the research's general topic and the confidentiality of the responses. The researcher listened deeply during the interview, showed empathy, and closed the conversation with gratitude for the participants' time (Gray, 2018). Interviews were scheduled with at least an hour between so that there was time for the researcher to reflect and take notes immediately after each interview (Creswell & Poth, 2018). Each participant was assigned a code name. The video recording and transcript were saved on a secure device using the code name.

Data Analysis

First, the researcher edited each transcript while replaying the video to remove auto-transcription errors. The researcher then rewatched the recorded interview and noted facial gestures and body language that indicated a depth of expression.

The researcher followed Colaizzi's (1978) descriptive phenomenological method (Morrow et al., 2015), as shown in Appendix F. Analysis using Colaizzi's process had seven steps. The first step was to read through each "participant account" several times. The second step was to identify the significant statements. Next, the researcher began formulating meaning but was cautious, using reflexivity to "bracket" opinions regarding the experience. As the researcher formulated meaning, she noticed that the data emerged into two layers. The first layer
was a contextual awareness of what the faculty members faced, and the second was a deeper layer of the detailed descriptions of shared emotionally driven themes. The fourth step in Colaizzi’s method was to cluster themes. To do this, the researcher grouped or clustered common themes while practicing reflexivity. Once the common themes were clustered, the researcher noticed that to develop an exhaustive description (step five), the phenomenon included the initial layer of contextual awareness and a deeper layer of common themes that had a more emotional basis. Step six was to "condense the exhaustive description down to a short, dense statement that captures just those aspects deemed to be essential" (Morrow et al., 2015, p. 644). Lastly, step seven was member-checking, where the researcher had participants review the deeper experience data to determine the validity and make modifications as needed.

The researcher performed the data analysis manually using Microsoft Word and Excel, not qualitative analysis software. This decision was based on the desire to work with available materials and not purchase special software. Plus, this approach allowed the researcher to have a closer and more detailed interaction with the data in all its stages. The final product presented significant contextual awareness categories followed by themes of the phenomenon and the data aligned to the conceptual framework.

**Trustworthiness and Ethics**

Gray (2018) explained how trustworthiness is developed from naturalistic traditions in qualitative research through (a) transferability, as seen in purposive sampling, (b) dependability, through the study’s results, (c) confirmability, easily replicated, and (d) credibility, prolonged engagement, and the use of member check. The researcher practiced these four attributes during the study. The following provides the details.
Transferability was built into the sampling strategy. The researcher selected participants based on their range of online experience pre-COVID-19 to transfer findings to reflect the larger college population. The insights gained offer insights about other faculty at different colleges. Dependability was demonstrated through the detailed description of the research process and the rich contextual descriptions of the participants (Peoples, 2021). If replicated, other researchers could confirm the study data and results. The interview protocol supported the research questions. Freeman and colleagues (2007) found trustworthiness increased when design methods fully described and supported the research questions. In addition, confirmability resulted from the researcher practicing reflexivity. Before interviewing each participant, the researcher practiced reflexivity and set aside her experience in the pandemic transition to listening deeply with "fresh" eyes (Gray, 2018).

Credibility was demonstrated through prolonged engagement in the same environment as the participants due to the researcher being a faculty member at the college. This shared work environment fostered confidence and trust between the researcher and participant, which helped establish rapport. In addition, the researcher performed a member-check of the thematic data with participants. Several participants received the research document with directions to review chapters four and five. They were asked to verify the accuracy of the information provided and the themes and data analysis. Each participant offered affirmative feedback on the accuracy of the data analysis. This study preserved participants’ anonymity and respected their time. Participation in the research was voluntary, and participants could withdraw (Gray, 2018).

Limitations and Delimitations

A limitation was the faculty and students were forced to transition to an online environment to protect their health and mitigate the spread of the virus. Some faculty were
already teaching online, and some were not. Faculty that were already teaching online had an advantage in the transition. This may impact how the participants experienced the educational and pedagogical changes. In addition, the faculty experience may be influenced by whether the participant had prior online teaching experience before the pandemic. The delimitation is that only full-time mathematics faculty were selected.

Summary

This methodology chapter provided the qualitative design and rationale for the research. The research questions were restated and included the role of the researcher. The participants were chosen using purposive sampling of tenured and tenure-track mathematic faculty from a large state college. The researcher interviewed nine faculty members with varying levels of previous online course experience. The interview process for collecting the data was described using a two-phased approach. The data analysis followed a seven-step descriptive phenomenological method. The importance of researcher reflexivity, along with both trustworthiness and ethics, was presented.
CHAPTER IV: PROFILES AND DATA

Introduction

This chapter presents the interview data of the phenomenological research study that examined the lived experiences of mathematics faculty at an open-access state college in Florida. The phenomenon was their experience in the rapid transition to online teaching due to the COVID-19 pandemic. This study applied the Teacher-Centered Systemic Reform (TCSR) model adapted for higher education by Gess-Newsome and colleagues (2003) as the conceptual framework to guide thematic analysis. The chapter begins with the analysis process, participant information, and participant profiles. The profiles provide a brief glimpse at the personal experiences of each participant during the onset of the pandemic. They include a narrative, background information, demographics, and other notes the researcher made during the interview. The researcher collected data during individual semi-structured interviews using Zoom as the video conferencing platform. The data analysis followed Colaizzi's (Morrow et al., 2015) seven-step data-analysis method. Lastly, the findings were categorized with the TCSR framework. One research question with two subcomponents guided the study:

1. What were the experiences of mathematics faculty during the rapid transition to online instruction due to the global COVID-19 pandemic?
   a. What were the challenges faculty experienced, if any, in preparing for and then teaching online in the forced modality change from on-campus to online?
   b. How did the faculty describe changes to their teaching practice, if any, due to the forced transition during the global pandemic?
Coding Process

The interviews took place virtually. Nine participants were recorded with the Zoom auto transcription feature enabled. The researcher took notes during the interviews indicating topics to return to, topics fully explored, and new areas that emerged beyond the interview questions. In addition, the researcher practiced bracketing, reminding herself to keep herself out of the questions, step back and focus on listening deeply to the participant’s stories. After the hour interview, the researcher spent time reflecting on the experiences, journaling what stood out for each participant, often where the participant displayed emotion or depth of feeling as they described their experience. The journaling or written reflections later helped identify significant statements and formulate meanings. Next, the researcher listened to each recording and edited the transcripts for accuracy. The researcher followed Colaizzi’s descriptive phenomenological method (Morrow et al., 2015; Appendix F). First was familiarization; the researcher read and reread each transcript several times and highlighted significant statements. To visualize the volume of ideas, the researcher created a large matrix of the critical phrases listed along a vertical axis with the participant pseudo names along a horizontal axis. Essential phrases that were similar were grouped or clustered together. The researcher used the matrix to formulate meanings being careful to bracket her experience in the transition and not let it overly influence the emerging themes. For example, to practice epoche, the researcher asked several reflective questions to ensure she was suspending assumptions and keeping bias in check to allow the lived experience to come through. This unpacking of the phenomena used bracketing checkpoints, transcripts, interview notes, post-interview journaling, and a matrix of essential phrases to create a holistic view of the lived experience.
The researcher discovered the data emerged into two layers. The initial layer was the participant’s contextual awareness factors; from these, a deeper layer emerged as more emotionally based themes. Lastly, this chapter presents exhaustive descriptions and essential aspects of the phenomenon with the fundamental structure aligned with the TCSR framework.

**Participant Information**

The researcher used purposive sampling to recruit math faculty at College A. Math faculty were selected for convenience and the shared teaching philosophy and experience for more consistent results. The participants were chosen to mirror the college-wide faculty’s pre-pandemic online teaching skill level. The skill levels ranged from no online experience to some experience to significant expertise. Pre-pandemic, only 20% of all faculty had online course design and teaching expertise. The other 80% had varying levels of expertise, with the majority having no online experience. To determine who to invite to participate, the researcher met with the mathematics leadership team, deans, and executive deans, for their recommendations of faculty that had no online teaching skills, some previous skills, and those that were experienced. The researcher invited nineteen faculty from across six campuses using the provided information. Before recruiting faculty, the researcher had received approval from the college's Institutional Review Board (IRB) to perform the research. Participants were notified of the confidentiality of responses, secure data storage, use of pseudonyms, and generalized identifiable information.

Nine faculty agreed to participate. The faculty that agreed completed a short demographic survey before the interview (Appendix G), confirming their online teaching experience level. In the weeks before the interview, the participants were asked to spend time refreshing their memory by looking back through past emails and their courses from Spring 2020. The selected
faculty reflected the pre-pandemic college-wide faculty skill level as two of the nine (about 20%) were experts in online teaching. Another two had some experience, and the remaining five had never taught online. The study results reflect the math faculty experience across College A.

**Participant Profiles**

**Pam**

"The challenge was I had never taught online before, ever! I didn't know how to do it. So what I did was I got my nice husband to go with me to get a whiteboard. And he put it on our wall, and I taught lectures and recorded them as if they were in the classroom. I had to learn how to make a YouTube account. How to download. My transition was a lot of work."

Pam never wanted to teach online. She turned to her husband and family for support when the pandemic hit. Pam was an experienced professor who had taught at the college for eight years. She thrived in the classroom and shied away from technology. She had a minimal understanding of the college's Learning Management System (LMS) and had not taken any professional development courses on online learning. Pam often bypassed online math platforms, preferring her students to use the textbook and assign homework from the book. Pam's joy was getting to know her students; since the forced transition, she has missed the face-to-face interaction. She was glad when the pandemic subsided and the college allowed her to return to teaching on campus.

**Kelly**

"I knew what it takes to be a good quality online course. What I did to my college algebra [during the rapid transition] is nowhere called an online course. It was just meeting their needs."

Kelly was an experienced online instructor when the pandemic transition occurred. She had taught online courses for over seven years and served as a faculty advisor for online course development. Kelly taught faculty professional development courses on how to create quality online courses. During the one-week transition period, even though she was experienced, Kelly
did not know where to start. Kelly had a statistics course in both online and in-person modalities. The in-person statistics course was easy for her to transition because she already had online instructional materials and a fully developed LMS course from her current online class, so she used these materials. Kelly had the most difficulty transitioning her algebra class because she had no available online resources. Kelly said that what she put together for the remaining 2020 semester was not a fully designed course. It was just materials to make it through the end of the semester. She did what she had to "survive the storm." Kelly found instructional videos on the Internet, wrote note sheets, and tried to keep to the original class schedule. Her in-person algebra classes used a collaborative learning method with peer-to-peer interaction. Her challenge was how to do this online. She turned to Zoom, the video conferencing software the college had just adopted. Zoom allowed her to meet virtually in real-time with students whenever her students had questions during the day or evening. She often recorded her virtual sessions to share with those who could not attend.

Stanley

"The first major challenge that I had was I did not have any online resources prepared. All of the classes that I had been teaching were face-to-face, in-class ... So I made instructional videos with step-by-step how to solve problems teaching concepts."

Stanley taught at College A for six years and at a previous institute for another five years. Pre-COVID, Stanley had completed the Digital Professor Certification and taught a few online classes four years earlier. Stanley felt comfortable using the college Learning Management System (LMS), including adding quizzes and assignments. He described the challenge of creating instructional videos during his rapid transition online. He barely kept a week ahead of his students to develop their needed content. When the pandemic began, he taught five courses with three different preparations. The three different preparations caused him to generate lesson
videos for three classes. Stanley found support from colleagues teaching similar courses at other campuses.

During the Spring semester, after the transition, Stanley’s students had one more test and a final to take. The exams were unproctored, and his test scores were 10% higher than the previous proctored tests. Since that timeframe, he changed to using a web-based artificial intelligence system that flags suspected incidents of academic dishonesty.

_Dwight_

"I was not prepared. When we returned, and everything started, I met students through Zoom. At the time, I would meet all my classes and hold all my office hours in Zoom. It was very stressful, and I worked very hard."

Dwight was not prepared. He had over 25 years of teaching experience but only in the classroom. Decades before the pandemic, Dwight had written a paper about the importance of teaching online. He thought he should do it but unfortunately never had. He was grateful that he had a week to prepare his course and prepare his students before classes resumed. Dwight shared that the emails from the college leadership, administration, deans, and the president were awesome because he felt supported to finish the semester and keep his job. He worried about the students and what they were going through, but they seemed resilient. During the transition, Dwight relied on experienced colleagues for guidance. He turned to Zoom and met with his students during their previous class times and during his student hours, teaching the content. Most students attended the virtual sessions; they were frightened, "we were in the same boat, and we were not going to sink." He later found out that he did not have to meet with students during their pre-pandemic class time and instead should run his courses asynchronously.

Dwight felt overwhelmed during the transition to keep up with creating online videos and learning new technology. At one point, his microphone broke, and he could no longer instruct
students over Zoom until he could purchase a new one. He felt embarrassed due to his equipment failure.

Andy

"Before the pandemic, I did not have Internet in my house, okay. I didn't have any access to the Internet, and so I couldn't work from my house because I didn't have Internet, so I had to go to my parent's house."

Andy, a forty-something-year-old mathematics professor, had over 20 years of teaching experience when the pandemic hit. With no internet at his house and no interest in teaching online, he was an experienced professional caught off guard. Andy knew very little about how to create an online course. His technology skills were out of date. He experienced shock and disbelief that he would have to convert his classes to online. Andy shared, "never in a million years had I thought I would live through something like this". Thanks to a generous colleague who shared their online instructional videos and other materials, he found the one-week transition easy. His transitioned courses were basic and rudimentary. His initial challenge was changing from a classroom where his students could raise their hands to ask a question to only communicating through email on different days and times, asynchronously. In the new modality, he felt he wasn’t teaching.

When the Spring semester ended, Andy struggled to create online course materials in preparation for the Summer term. He described his learning struggle as "lots of frustrations at the beginning of the pandemic with technology" He worked all day and all night getting ready. College A assigned an online course designer to work with him. A year and a half later, Andy said he is now much more confident designing and teaching online.
Angela

"I don't like surprises. I like to plan every minute; everything from day one is scheduled. So to me to switch from something that's already structured, set up, ready [her in-person class], to go to online ... it was panic."

Angela was a planner, and as she mentioned in her quote, she had her spring classes well planned for each class session. She had 13 years of teaching experience, was proficient with the college LMS, felt comfortable using online math platforms, and yet felt panicked during the rapid transition to online. Angela had taught a few online courses seven years before the pandemic, and through her past online teaching experience, she decided online teaching was not for her. The pandemic forced her into the online modality. Angela was frustrated because her lesson plans involved hands-on, active learning with students engaged in group work, and suddenly she could only interact with them asynchronously online. Her initial panic turned into determination to continue. Due to her previous online training, she knew what to do. She learned she was more adaptable than she previously thought. She went to work, continued with her syllabus plan, and reassured her students that they would navigate the rest of the semester together.

Jim

I can't. I'm done. This is crazy, I'm never going to do right by the students, and I don't feel comfortable. I'm not enjoying any of this. It was literally like having a root canal every day. It was like pure pain."

Jim was a seasoned professor with over 30 years of teaching experience in a brick-and-mortar classroom. Jim was a popular caring instructor whose classes were first to fill with students. He felt comfortable in his role teaching mathematics, and he had refined his practice from years of working with students and making reflective changes. Jim had never planned to teach online and did not want to. He felt his strengths were in the classroom, building relationships with his students, and often mentoring them on career goals. The COVID-19 rapid
transition online caused Jim fear and dread. He shared with his family, "I think it is time to pack it in [retire]. I don't think I'm going to be able to make this transition." He was dreadfully transitioning online as he had no idea how to begin and had avoided technology. He lacked confidence and felt embarrassed to think his students would expect perfection. He felt his students "deserve to have someone who knew what they were doing."

Michael

"I felt prepared for a crazy transition ... I was the life vest [to other faculty]. There were times where I spent multiple hours in Zoom calls with particular faculty members helping them in Canvas, literally like tech support."

Michael was an experienced online instructor. He had taught at least one online course each semester for over 17 years. He knew about online course creation, the college’s Learning Management System (LMS), and math software platforms. He helped create the college Digital Professor Certification courses and taught other faculty how to teach online.

During the rapid online transition, Michael taught four different courses but did not feel much pressure. He had previously created instructional videos for three of his four other classes, so it was a smooth transition for these three classes. He uploaded his old videos and notes to the LMS for his former face-to-face courses. In addition, Michael informed his students of the new plan and how to navigate the latest resources. The course that caused him the most work was the one he did not have videos. This course did have an e-book with publisher videos. Michael spent the transition week creating weekly learning modules adding math content, and linking the publisher videos to the new modules.

Michael's most significant challenge came after the initial rapid shift during the Summer term as the pandemic continued. In the summer, College A offered a Digital Professor Certification program and provided a financial incentive for faculty to participate. Michael was a
facilitator, and in the role, he spent a significant amount of time and attention working with adjunct faculty "that needed real, serious hand-holding." He felt his mission was to ensure students had a good experience, which meant doing whatever he could to help faculty provide that experience. He felt terrible for the students, knowing how hard it would be for them to be forced online and now experience a disorganized course with an instructor who does not communicate well.

Michael was frustrated and upset about students cheating on online assessments. He spent a lot of time and effort creating several real-world application problems for an exam, only to discover that one of his students shared the question to an online math solver website.

Kevin

"It was huge for me. I relied on colleagues a lot, copied, you know, things from them ... It was a daunting task to try to do everything in such a short time frame. I had to modify all my classes ... four different preps ... that was a lot to undertake."

Kevin taught mathematics for 20 years. He was interested in teaching online but had not done it. Kevin had completed one professional development course on the basics of the college LMS, Canvas. He was comfortable using online math software along with an e-book. He typically taught what the college called an overload each semester, seven classes, often with four different preparations. Kevin was grateful that colleagues shared their online videos and course materials with him. Without their materials, he did not know what he would have done. The shared materials were used for two of his four different courses. Kevin borrowed his wife's iPad to create instructional videos for his other two classes. It was hard for him to keep a week ahead of his students. His colleagues guided him through the technology and how to make videos. Kevin shared that the transition was stressful, and he does not have fond memories of the Spring 2020 semester. He made mistakes when creating his first assignments in the LMS. The mistakes
allowed students to take advantage of accessing a test ahead of schedule. He shared that everything about the transition and the remaining month of the semester felt wrong.

**Data**

The data illuminated the participants shared descriptions of their lived experiences. During Colaizzi’s (1978) data analysis, the researcher found the data emerged into two layers. The first outer layer was contextual awareness. Dey (2001) defined context as "any information that can be used to characterize the situation of an entity. An entity is a person, place, or object considered relevant to the interaction between a user and an application, including the user and applications themselves" (p. 5). The context applied to this study was the pandemic sparked a situation that changed the participants’ external environment and influenced how they answered. The participants sensed and reacted in contexts such as overcoming fear, loss, finding resources, the extent of learning, and changes in teaching practices. Below the outer layer emerged a second, deeper layer; it is the essence of the overarching themes that surfaced from the interviews.

*Contextual Awareness*

Faculty experienced challenges preparing for and teaching online in the forced modality change from on-campus to online classes. The researcher used Colaizzi’s method (1978) for analysis. The initial data emerged as an outer layer of contexts. Six categories of context surfaced from the interview data: (a) overcoming the initial shock, fear, and loss; (b) available resources, including support; (c) the extent of learning; (d) changes in instructional methods; (e) assessment practices, and (f) teacher thinking. Participant quotes are included to add a detailed description of the context.
Contextual Awareness: Overcoming Initial Shock, Fear, and Loss

Eight of the nine faculty described their rapid transition as stressful, fearful, daunting, and evoking shock, disbelief, and uncertainty on the way forward. Five faculty had minimal knowledge of designing an online course and had never taught one. Pam said, "The challenge was I had never taught online before, ever! I didn't know how to do it". Andy was like Pam in that he had no online teaching experience. He had taught at College A for over 19 years, but only in a classroom. He was reticent in trying new technology and often avoided online materials. Andy described his initial shock as feelings of disbelief, uncertainty, and “I can’t believe this is happening.” He shared that “never in a million years [had] I thought I would live through something like this.” Andy did not have the internet at home, so he decided to live and work from another family member’s house. Two other experienced faculty, Angela and Kelly, shared a theme of initial panic and fear. Even though Angela and Kelly had previous online teaching experience (pre-pandemic), they both felt a sense of panic with feelings of "I don't think I can do this” (Angela) and “I don’t know where to start” (Kelly). Most of the feelings from these two participants stem from the challenge of transitioning from collaborative classroom learning where they could walk around coaching their students while observing nonverbal cues to not having a way to recover this style in an asynchronous environment. For example, the loss of students working in groups with their peers on a whiteboard, talking and discussing while the teacher coaches. Angela shared, “I am a hands-on instructor who had a lot of face-to-face interactions with my students. Suddenly, I could interact with them only from a distance; that was frustrating”. The students no longer met in real-time; the course changed to lecture-based—a loss of how the class was organized as active learning.
The majority of faculty felt a loss of connection with their students. They missed the nonverbal cues of face-to-face interaction. To help retain the former teacher-student relationship, the faculty turned to virtual Zoom learning sessions held when their pre-COVID courses had met. They wanted to interact in real-time to see the nonverbal cues again, regain the feeling of connection with their students, and help them succeed in the remaining weeks.

Four faculty with no previous online teaching experience felt a loss of confidence in their teaching ability. For example, Jim was a seasoned professor with over 30 years of experience in the classroom. He did not have technical skills. Jim felt fear and a sense of “impending dread” at creating and facilitating an online class and not just for one class, but the reality of transitioning all four of his classes. He was “five minutes away from just retiring.” He endured a loss of confidence and embarrassment and felt empathy for his students. Jim shared:

How can a leader who doesn’t have confidence in what he or she is doing? How can I fake that? I can’t; they’ll see right through me. Most of my students were much better at technology than I was. Frankly, there was an element that was embarrassing to me … they [students] would expect me to know what I was doing. I had no idea what I was doing … I thought that the students deserved to have someone who knew what they were doing.

The loss of proctored testing challenged all nine participants. To prevent the spread of the virus, the college closed the testing centers, which ended proctored testing. The faculty had to figure out how to assess their students online. Many shared their frustrations over the loss of proctored testing and the inflated grades due to academic dishonesty. Angela shared, “I’m not sure who was the one taking the tests … I’ve tried different things to minimize the potential of cheating, but there’s no substitute for face-to-face proctoring.” Stanley noted that his students
had to take one more test and their final exam during the transition semester. The grades on these two non-proctored tests were ten percent higher than before. Pam added that her students “who were going to fail or get a D, magically got B’s, and those who were going to get a C got an A”.

**Contextual Awareness: Available Resources**

Every participant expressed how not having previously created online materials such as notes, videos, quizzes, and tests was challenging, especially instructional videos. Those that had videos felt the transition was more manageable. Expert Michael shared, “I think having a lot of those videos done already made … the transition easier for me.” In contrast, the faculty that had never made an instructional video often found help from colleagues. For example, Andy shared how a colleague “was kind enough to just give us basically his whole course” and what a big sigh of relief this was for him and other instructors. Kevin experienced something similar to Andy when he used a colleague’s instructional videos for his college algebra students, “I used to joke with Michael [name changed] and tell him he was teaching my college algebra classes.” Kevin felt this way because his students heard Michael’s voice and teaching style in their videos.

Angela did not consider making videos. Instead, she found existing videos that applied to the topics that her students needed. Another group of participants (Pam, Stanley, Dwight, and Kevin) struggled with learning how to record lecture videos and upload the videos to the LMS. Stanley and Dwight leaned on Google and colleagues to teach themselves how to make a video using a laptop and a digital pen. Pam’s husband hung a whiteboard on the living room wall. She propped up a camera and filmed herself teaching at the board in her home. Kevin borrowed his wife’s iPad to create videos.
Contextual Awareness: Extent of Learning and Support

Participants shared who supported their learning and the extent of the learning. The five participants that had never taught online described the amount of learning during the transition as starting from zero with a massive, steep learning curve. The faculty had to learn the basics of a Learning Management System (LMS), the various options for configuring a class, navigating, and creating pages, assignments, and discussions, and how these are part of developing an excellent online course. The faculty learned how to upload video links and instruct students in understanding the LMS. Faculty reported they made mistakes. They made errors such as posting a test as a discussion assignment where students could see the answers, not notifying students that they could not work together on a test and forgetting to publish an instructional video so students could watch it.

Most faculty struggled to create the learning content ahead of their students’ needs. Inexperienced faculty felt like they were working all the time. Andy shared that he worked "all day all night and then can only go walk around the neighborhood just to get a respite." Stanley was similar and stated:

During that transition time, I lost track of office hours and a schedule. I was just working from the time I got up to the time I went to bed with pauses for meals and taking showers, often working on learning in time to stay ahead of their [sic] students.

In the months following the rapid transition, faculty described the challenge of learning the technical skills to teach online. Andy expressed his experience, “many disappointments and frustrations, pulling my hair out with the technology because there are always so many hiccups.” Andy found help from a course designer who was assigned to assist him. He recalled calling her many times asking how to do this and how to do that. At one point, Andy lost all the work he had
spent ten hours creating. The course designer “saved the day” and helped Andy recover the lost work.

All participants described the support they received from multiple places, colleagues, students, family, course designers, professional development courses, and the college administration. Support from other colleagues surfaced as the most often cited. In addition, participants felt supported by the college administration. Dwight shared, “messages that our admins, deans, and presidents sent was [sic] awesome because we felt we were going to be able to handle our jobs.” Andy and Pam talked about how the dean held twice a week Zoom meetings for faculty to collaborate, share what they were learning and help others with technology. Many faculty mentioned how their students were helpful. One student told Pam, “Did you know we can see the answer?” Pam did not, and she quickly learned how to correct the issue. Jim felt his students provided positive feedback and constructive criticism. For example, Jim created a video, and part of the video was not functional. His students suggested setting up the lighting to be more effective. During the transition, Jim referred to his colleagues, administration, and students as “more of a collaborative effort than I could ever have imagined.” Angela echoed his sentiment, “At this time of crisis, everyone came together to ensure a smooth transition for our students, faculty, and staff.”

The faculty pieced together what they could to finish the Spring semester. They did not have the time to create a well-designed course; they borrowed online materials like instructional videos, notes, and Canvas (LMS) assignments from colleagues. Faculty worked long hours trying to stay ahead of their students with instructional content. Faculty saw inflated grades with the end of proctored testing. The challenges continued into summer as the faculty attended
accelerated professional development for online teaching and tried desperately to put together organized classes for summer, often making and only staying a week ahead of their students.

**Contextual Awareness: Changes in Instructional Methods**

**Instructional Practices that Continued**

The administration asked faculty to follow their spring syllabi as best they could and be flexible with students. The participants continued their syllabus plan, continued with the previously assigned homework and kept using their notes once they converted the notes to an online format.

Most participants continued the previously planned mathematical content and did not reduce the material covered. Several of the faculty mentioned that even though they lost a week of class time due to the transition week, they still assigned the work to their students. Pam said, “I find that online I don’t get behind … it’s more on them [students]”. Two participants indicated that they cut out a test and put the material on the final to make up for the lost week of instruction; some participants shuffled course content into other weeks.

**New Instructional Practices**

All the participants had to change how they formerly communicated with their students. Participants mentioned that they could no longer observe facial expressions and body language in the online modality, which lost their ability to assess student learning formatively. Stanley, Angela, Pam, and Jim described the change as losing connection and relationship building. The new practice was communication through emailing and announcements. Stanley began sending his students weekly video announcements to help them feel more connected. In addition, all four began meeting their students virtually through Zoom during the former class time.
Using instructional videos was a new practice. As previously discussed, a challenge, especially for the five faculty that had never taught online and for all the faculty that did not have previously recorded videos. Faculty either learned how to make videos or found videos that others had made. Kevin, Pam, Stanley, and Dwight learned how to record lecture videos and upload the videos to the Learning Management System (LMS). As discussed in the challenges, Andy, Kelly, and Kevin borrowed videos from colleagues or found videos on youtube.com. The faculty had to learn how to navigate the technology, but they (Pam and Michael) were challenged to teach their students how to download, scan, and upload assignments.

All the participants discussed the importance of Zoom for student engagement and recording answers to questions. Zoom was a new tool that College A provided shortly after the transition. Pam stated, “Zoom is priceless,” and she went on to say, “if someone asks a question, I create a zoom session and use the Zoom whiteboard and record myself doing the problem and send it to them.” Jim would agree, “it’s just incalculable in terms of its importance as a tool for me. I use it all the time”. Using Zoom helped many faculty feel more connected with their students and gave them a visual platform to solve math problems.

New instructional practices were teacher-centered, changing from previous student-centered learning. Faculty struggled to find ways to create collaborative learning virtually. The best method that Angela, Kelly, Dwight, and Pam came up with was offering optional virtual Zoom sessions at the former class time. During virtual meetings, students could interact with each other and their professors. The virtual sessions were not required as that would have been against the college policy of asynchronous learning.

Several participants became more sensitive to students’ needs, more adaptable, and more compassionate because the students had not signed up for an online course. Converting online
was the only way to keep learning during the pandemic for health and safety reasons. Several other faculty members did not change their instructional practices as they were already sensitive and flexible with students. Stanley described one of his new instructional practices as looking at the progress of every single student instead of the whole class and reaching out to individuals that did not turn in an assignment by the due date.

Return to the classroom

At the time of the interviews, a year and a half after the Spring 2020 rapid transition, all nine participants had returned to teaching at least one class on campus. Eight of the nine faculty offered their online resources to their on-campus students, such as their instructional videos, notes, and discussion assignments. This was a change as the four faculty that had taught online previously did not offer their online materials to classroom sections. Pam mentioned that she now does short concept quizzes online, whereas before, her students took the quiz in class which took up class time. The faculty shared that if a student were absent from class, the student would have the missed content available online. Another change was that the department no longer felt they needed to get a substitute teacher for an absent faculty member. In the past, faculty absences were covered by another instructor. The absent faculty member is now asked to notify their class that they will be out and to let their students know what videos to watch and assignments to complete. Lastly, most faculty struggled with how to return to group work and student collaboration since the campus was still under a 6-foot distance protocol.

Contextual Awareness: Assessment Practices and Thinking

The rapid transition online changed how faculty assessed students. Faculty could no longer formatively assess by walking around the room and observing body language and facial expressions. Summative testing changed from proctored tests in the classroom to non-proctored
tests taken from home or anywhere a student found reliable internet. Faculty added time limits and changed some question types to prevent the use of free online math solvers. As time progressed, many faculty added ethics statements; some created more narrative concept checks, portfolio assessments, and authentic assessments based on real-life problems to cut down on students finding answers. During the rapid transition, the college did not have a way to proctor a student. Eventually, by the Summer term, the college had an optional web-based online proctoring service that many faculty felt was not good enough. The majority of faculty wanted to see a return to in-person proctoring.

Thinking about Assessment

All nine participants were challenged by the loss of proctored testing, which brought inflated grades due to academic dishonesty. The paradigm shift sparked a change in thinking about assessments.

Andy, Jim, and Michael’s philosophy on testing changed from the traditional proctored computational problems to a more open view on other ways to assess through projects and portfolios. Andy knew there would be a lot of cheating going on, and he just accepted that and tried to envision what testing would look like if you assumed that everybody cheats. Can learning still take place? He now requires students to complete a portfolio. His students only earn a few points for a correct answer. Then a more significant percentage of points are made for demonstrating specific criteria, often in narrative form with extensive rubrics.

Similarly, most participants have added test questions that evaluate critical thinking using narrative and explanation instead of rote problem-solving. Dwight and Jim were also struggling with their beliefs on assessment. Dwight described his struggle, “Could I make a test where it’s okay to have formulas in front of you? Could I evolve into a different kind of teacher where this
is, okay?” Jim also wrestled with, “how can I create an assessment that accurately represents a set of skills that a student would be able to extrapolate from and utilize in their real life?”

Pam is back teaching in the classroom, and she said that she had not given a real test (closed book) because she feels that if her online students in the same course have open book tests, then her classroom students should. She has changed her view, “letting someone have a notecard is not a big deal to me anymore.”

**Contextual Awareness: General Changes in Teacher Thinking**

The faculty shared additional reflections regarding online teaching and learning during the pandemic in the interviews. All the participants commented that the college Digital Professor Certification program was very helpful in learning how to create and teach an online course. The experienced and semi-experienced faculty had taken the course work before the pandemic. Those that had not taught online took the course work at their first opportunity during the summer after the rapid transition. For example, Jim was new to online teaching. He described:

The courses that we had to take as part of the digital certification process … everything I learned on a Wednesday I used on a Thursday. I mean, I literally was like pulling stuff from all those courses that I was taking, and it was helping me create what I thought was a professional learning experience for the students.

All five inexperienced faculty discussed how the pandemic was the spark that motivated them to learn. Without the pandemic, they would not have known the new technology and ways of doing things. They are better instructors because of the pandemic. For example, Andy shared, “I learned a lot more about technology and the new modality of teaching than I ever thought I would.” Jim and Andy now realize the value of online math tools. Before, they just felt required
to set up the online e-book. Now they realize how vital some visualizations are, especially for rotating three-dimensional objects in Calculus III.

At least three faculty (Pam, Kevin, and Angela) believe online learning is not as good as in-person learning. Pam gave an example of a student making a minor error in a step when solving a math problem, and in the classroom, you can correct them and show them the right way. There is very little of this occurring online. Her views have changed because she has come to respect and value online teaching more than she did before. She still does not think it is as good as face-to-face, except for certain groups of students that are disabled or whose personalities are more suited to not being around other people. Kevin would add that we need both modalities as they suit some people. Michael, the online expert, believes that some faculty should not be teaching online. They do not have the skills and dedication to the volume of communication and interaction with students that online teaching requires. He also feels that some students should not take online classes due to a lack of time management and self-discipline needed to succeed.

Themes

As the researcher reviewed the elements of contextual awareness that were just described, a more profound element, an inner layer of meaning, emerged. The internal layer elements were not necessarily isolated to a particular context but were embedded messages of the lived experience. Five themes surfaced from the analysis of the texts of the interviews, and these influence how to conceptualize the Teacher-Centered Systemic Reform model. The themes are overlapping and interdependent, with no single one fully depicting the phenomena of being a faculty member during the rapid transition period. This section presents these emergent themes from the faculty experiences.
Professional Emotions

The rapid transition to online teaching and learning caused faculty to endure emotional turmoil as they tried to adjust from one teaching method to a new, often completely different one. Their professional world was turned inside out, especially for those who had never taught online. For example, Andy had taught about 20 years in a classroom, never online. He was reticent in using technology, had no computer or internet at home, and avoided electronic teaching materials, preferring books and paper. He described his initial shock at the reality that he would have to transition online, “I can’t believe this is happening … never in a million years [had] I thought I would live through something like this.” Jim had a similar experience. Jim said, I can’t. I’m done. This is crazy. I’m never going to do right by the students, and I don’t feel comfortable. I’m not enjoying any of this. It was literally like having a root canal every day. It was like pure pain.

The pain was figuring out the way forward, navigating the transition, learning the technology that online courses need, and doing this in time to continue the semester. Even faculty with online teaching experience felt powerful emotions. Angela, and Kelly, shared initial feelings of panic and fear, "I don't think I can do this” and “I don’t know where to start,” as they considered the way forward.

Embarrassment and a loss of confidence were emotions that significantly impacted the faculty that had never taught online. For example, Jim was an expert professor with 30 years of classroom teaching experience. He felt confident teaching at the board and circulating the classroom but was inexperienced in teaching with technology. When the rapid transition became a reality, Jim felt fear and “impending dread” at the thought of creating and facilitating an online class. He was “five minutes away from just retiring.” He lost confidence in his ability to teach
and felt embarrassed over this. Faculty are supposed to be the smart ones in the classroom, and now Jim’s students had the tech-savvy upper hand, leaving Jim feeling inferior and lacking confidence. Jim shared:

How can a leader who doesn’t have confidence in what he or she is doing? How can I fake that? I can’t; they’ll see right through me. Most of my students were much better at technology than I was. Frankly, there was an element that was embarrassing to me … they [students] would expect me to know what I was doing. I had no idea what I was doing.

It was very significant for Jim and the other seasoned professionals to have no idea what they were doing.

In addition, faculty shared how their learning and mistakes were exposed to an audience, their students. Students often experienced their professor making technology blunders which added to faculty embarrassment. The faculty-student roles reversed as students helped their instructor. Pam made a mistake and uploaded her first online test as a discussion. Her student asked, “Did you know we can see the answer?” Pam did not know the answers were showing, and she quickly corrected the problem.

As described above, faculty experienced many emotions tied to their teaching and learning, often an inner turmoil related to the external environment. For example, faculty experienced panic, fear, uncertainty, loss of confidence, and embarrassment as they made mistakes in learning to navigate the new modality.

**Professional Learning**

Faculty experienced challenges in the amount of technology learning they underwent in a short period which often brought frustration and feelings of never-ending work. The knowledge
was more extensive and arduous for faculty who had never taught online. Several faculty shared how they had to learn the basics of a Learning Management System (LMS) and the various options for configuring a class and navigating and creating pages. The connection between pages, quizzes, assignments, and discussions, and how all these are part of developing an excellent online course. Many faculty did not know how to do any of it. Andy expressed his experience, “Oh, many disappointments and frustrations, pulling my hair out with the technology because there are always so many hiccups.”

Faculty learned how to create instructional videos and search out and curate videos made by others. They then had to upload video links to the LMS and figure out how to instruct students on how to navigate online. Things like downloading documents, scanning, and uploading written work. Faculty reported they made mistakes. They made errors such as posting a test as a discussion assignment where students could see the answers, not notifying students that they could not work together on a test, and forgetting to publish an instructional video so students could watch it. The participants described the amount of learning as “starting from zero”, “massive”, and “a steep learning curve”. The learning took up a lot of time. Stanley shared, “I was just working from the time I got up to the time I went to bed” to stay ahead of his students.

All five inexperienced faculty discussed how the pandemic was the catalyst that motivated them to learn. Without the pandemic, they would not have known the new technology and ways of doing things. They are better instructors because of the pandemic. For example, Andy shared, “I learned a lot more about technology and the new modality of teaching than I ever thought I would.”
Teacher Culture

Faculty experienced challenges and changes within their college culture regarding resources, support, professional development, and assessment. Faculty that had previously created instructional videos had an easier time than the faculty that had to develop or find videos. For example, Andy shared how a colleague “was kind enough to just give us basically his whole course” and what a big sigh of relief this was for him and other instructors. Kevin was grateful his colleagues shared their instructional videos. He did not know what he would have done without their online materials.

Faculty felt a great sense of needing each other, of coming together in a crisis to help each other out and ultimately help their thousands of students keep learning. Jim described the support as “more of a collaborative effort than I could ever have imagined”. Faculty experienced support from colleagues, their students, and the administration. Angela said, “At this time of crisis, everyone came together to ensure a smooth transition for our students, faculty, and staff.” They also felt support from the college administration. Dwight shared, “messages that our admins, deans, and presidents sent was [sic] awesome because we felt we were going to be able to keep our jobs”. Michael echoed this sentiment, “given the crazy situation we were in … the college definitely did everything it could to try to help the faculty that needed the help”.

The participants valued their professional development either before the pandemic or soon after the rapid transition. Jim participated in the digital certification process. He said, “everything I learned on a Wednesday I used on a Thursday. I mean, I literally was like pulling stuff from all those courses that I was taking, and it was helping me”.

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Pedagogy

Faculty experienced a rapid transition from classroom student-centered learning, such as group and collaborative work, to virtual teacher-centered education, video-based. The student-centered learning did not transfer well to the virtual environment due to technological limitations and the change to an asynchronous environment. Gone were the days when the faculty could walk around the classroom, reading and adjusting their teaching to students’ nonverbal cues observed through live interactions. The faculty described the change as a loss of connection and relationship. Faculty could no longer clarify a concept or answer a student’s question in real-time. Angela felt a loss of control, saying, “I am a hands-on instructor who had a lot of face-to-face interactions with my students. Suddenly, I could interact with them only from a distance; that was frustrating”. The internal frustrations resulted from the external environment’s shift from verbal to primarily written communication through emailing and announcements. Faculty could no longer answer student questions in real-time; now, questions and answers were relegated to written messaging, often with a delay and often involving more time than a quick demonstration in the classroom. Faculty lost the ability to formatively assess student learning using facial expressions and body language; cues that informed their content delivery. To recover some of the lost connection, the faculty turned to Zoom.

All the participants discussed the incorporation of Zoom as a new instructional practice for student engagement and connection. Faculty stated, “Zoom is priceless” and “incalculable in terms of its importance as a tool” for student interaction. Faculty used Zoom to meet with students during student engagement time (office hours) and as a tool for learning. Through Zoom, faculty could create short videos demonstrating the process and multiple steps for solving
math problems, and when meeting live, they could regain some sense of connection or community.

*Instructional Values*

Faculty were internally challenged by the external context of the closed testing centers and the loss of in-person proctored testing. The validity of assessments was challenged due to academic integrity, considering students were now testing in their homes with no one watching, coupled with the reality of the abundance of free math solving apps directly in the hands of students. Faculty struggled over the new situation. Michael described the problem, “If you are not proctoring [a test], students are going to cheat”, “cheating is rampant”, and “it’s just too easy for them to cheat at home”. Angela shared, “I’m not sure who was the one taking the tests … I’ve tried different things to minimize the potential of cheating, but there’s no substitute for face-to-face proctoring.” Michael described an incident where he had spent hours creating an authentic assessment with more math application and less computational questions with the hope that it would be less cheatable. While grading the evaluation, he found several students had very sophisticated answers well beyond the material learned in his course. He discovered that a student had submitted a picture of his problem to an online solving website, Chegg. The website had a master tutor solve the problem for other paid users to view. Michael felt “so angry … I was angry at the student for doing that. For not valuing the learning experience … All they cared about was their grade, they didn’t see the value in the learning process, and I took that really personal”. He still felt bitter and frustrated when he shared the story. Andy shared his inner turmoil over the rise in academic integrity, “If you assume everyone cheats, can learning still occur?” Stanley noted that his students had to take one more test and their final exam during the
transition semester. The grades on these two un-proctored tests were ten percent higher than before the pandemic.

As seen, five themes emerged from the initial layer of contextual awareness. The themes described a great deal of inner turmoil based on the pandemic environment and the subsequent changes. The themes are interwoven, overlapping, and describe the phenomena of the lived experience during the rapid transition. The following section aligns the research data with the TCSR conceptual framework. The data alignment indicates a new adaption to the TCSR was needed. The proposed new adaptation is discussed in Chapter V.

**Alignment of Data to Conceptual Framework**

This study used the Teacher-Centered Systemic Reform (TCSR) model (Gess-Newsome et al., 2003) to organize the faculty phenomena in the rapid transition to online instruction. Figure 2 provides a visual of the study data aligned with the TCSR’s four groups: (a) personal factors, (b) teacher thinking, (c) contextual factors of structure and culture, and how these interplay and influence (d) teachers’ practice. A checkmark in the figure box indicates that information related to the TCSR factor was identified in the data. No checkmark indicates that the information was not asked about or did not emerge from the interviews.
Figure 2: Data aligned with the TCSR model (Gess-Newsome et al., 2003)
Starting with the Personal Factors column (far left), the researcher identified types and years of experience, the nature and extent of teachers’ preparation to teach, and the nature and extent of teachers’ continued learning efforts. For example, the TCSR category’s nature and extent of teachers’ preparation appeared as a contextual factor in the current data. Whether participants had previous online teaching experience was an influencer in their practice. Similarly, participants’ pre-COVID-19 learning efforts in the online modality were a factor that influenced their teachers’ practice.

The Teacher Thinking category had every indicator but one, schooling and schools. The study was conducted only at College A, and the participants did not mention other schools influencing their thinking. The Teachers’ Practice category was often cited as participants described their contextual awareness of what they continued, discontinued, and what was new in their practice.

Aligning the TCSR Contextual Factors column on the far right with the emerged data found many of the indicators present. The researcher found three indicators under the Broader Cultural Context category. Participants’ professional development emerged, the textbooks and teaching materials were mentioned (in whether there were instructional videos), as were the structures and cultural norms of interaction (support and collaboration), goals of schooling, and behavior. The School Context had indicators of technology when participants indicated borrowing or acquiring a device, the college president was mentioned, and the cultural norms of interaction, goals of schooling, and behavior were evident. Interview data emerged representing the six Department and Subject Area Context indicators.
The technology indicators of textbooks, materials, and especially assessments were mentioned in the Classroom Context. There was some data on student demographics, abilities, and personal expectations. The repeated indicator of cultural norms of interaction, goals of schooling, and behavior was evident.

**Summary**

Chapter IV presented the thematic findings of how nine faculty experienced the rapid transition from face-to-face teaching to online instruction due to the global coronavirus pandemic. The chapter described the phenomenological coding process, which used Colaizzi’s method (1978), and then provided information about participant selection. Next, the researcher presented each participant’s profile, six contextual awareness categories, and the five emergent themes. Faculty lived through professional emotions as they internally tried to make sense of the external environment. The faculty experienced professional challenges as they learned how to recreate their courses online in a short timeframe. The faculty felt a deep sense of teacher collaboration and a renewed value for one another. Faculty felt supported by their administration, colleagues, and students. The college provided Digital Professor Certification courses and individualized help in course design. Many faculty were challenged with overnight pedagogy changes from student-centered to teacher-centered learning, which brought a loss of personal connection, a loss of seeing people’s faces, and physical presence in the same space. Lastly, the faculty’s values were challenged due to the loss of proctored testing, the new environment of students taking assessments from home, and increased academic dishonesty.
CHAPTER V: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

The final chapter discusses the findings organized by the research questions and their relationship with literature, a proposed modification to the conceptual framework, and recommendations. The recommendations section is separated into guidance for faculty and administrators for supporting each other through a crisis.

Introduction

This qualitative study explored the lived experience of faculty at a state college through the rapid transition to online teaching due to the global COVID-19 pandemic. The study adds knowledge to the literature on the COVID-19 shift in higher education, specifically from the math faculty perspective. Faculty are the frontline team for students’ education at a college, and their views on the value of online learning programs may determine a college's future direction. This study helped understand the faculty experience, the challenges, and changes due to the rapid modality shift; the knowledge can transfer to other faculty and educational leaders as they consider improvements in reactions to future course interruptions. The researcher believes the knowledge from the past may improve future teaching and learning during a crisis. The study found that faculty often experienced various emotions and internal turmoil due to the external pandemic. The interior themes that emerged from the interviews were (a) professional emotions, (b) professional learning, (c) teacher culture, (d) pedagogy, and (e) instructional values. When grouped, these five themes add a new proposed category to the Teacher-Centered Systemic Reform (TCSR) model (Gess-Newsome et al., 2003). The new category is described later in this chapter. The following questions guided this study:

1. What were the experiences of mathematics faculty during the rapid transition to online instruction due to the global COVID-19 pandemic?
a) What were the challenges faculty experienced, if any, in preparing for and then teaching online in the forced modality change from on-campus to online?

b) How did faculty describe changes to their teaching practice, if any, due to the forced transition during the global pandemic?

**Research Question 1: Relationship of Findings to the Literature**

*Professional emotion challenges:* For most people, emotions are part of the educational experience. Being a beginner and making mistakes can make anyone feel awkward and embarrassed (Bregman, 2019). This finding is consistent with what the participants’ shared. Faculty and students experience emotions in the challenges of learning. Learning something new is often uncomfortable (Bregman, 2019). Student challenges include juggling work and family responsibilities as they strive to improve their economic situation and maintain a good GPA. Dedicated faculty build relationships with their students and feel strongly about their teaching practices and ability to make a difference.

The COVID-19 transition heightened emotions and brought challenges. Many faculty were minimally prepared and felt exposed as they had a visible learning curve as students watched. The faculty had to figure out how to deliver content in a very different way. The participants shared they felt embarrassed when they did not know how to navigate online technology, and students often witnessed this lack of knowledge. The faculty thought they did not measure up to their standards of expertise. The participants felt afraid and overwhelmed as they considered how much learning and work it would take to transition their courses. This feeling was consistent in other research with faculty after the pandemic in Canada (VanLeeuwen et al., 2020) and the US (Johnson et al., 2020). The Canadian faculty also described their
emotional state as “a cycle of never-ending repetitiveness and fatigue” (p. 7) due to mental and physical exhaustion.

Professional learning: The study participants expressed that preparing to teach and teaching online was a lot of work. This is confirmed by other research studies on pre-pandemic and post-pandemic (DeGagne & Walters, 2010; Marek et al., 2021). Marek and colleagues (2021) surveyed over 400 faculty across the world and confirmed that faculty “experienced considerably higher workloads and stress when converting classes to distance learning” (p. 103). Similarly, the current study participants with little to no online experience had a more challenging time learning and transitioning their courses when compared to faculty with previous experience. This result was consistent with the Marek and colleagues’ (2021) quantitative study, which found that “the most common predictor of positive faculty experiences in the conversion to distance learning was experience in previous semesters teaching online” (p. 103).

Comparably, the Marek and colleagues’ research and other researchers (Johnson et al., 2020) also found that experienced online faculty used new teaching tools. This study’s participants indicated the primary new teaching tool was Zoom. In addition, themes of participants wishing they had learned new technology sooner so they would not be panicking and how the pandemic transition was so unexpected were confirmed in other studies (Marek et al., 2020, Petzgold, 2020).

Research Question 2: Relationship of Findings to the Literature

The pandemic was a catalyst for change (Rupnow et al., 2020). Faculty described changes made to their teaching practice in the themes of pedagogy, instructional values, and teacher culture due to the forced transition during the global pandemic.
Pedagogy: Previous research detailed disadvantages of asynchronous online learning as missing the students’ facial expressions and live interaction with instantaneous feedback (Watts, 2016). The study participants expressed the same disadvantages. For example, Angela and Pam described a loss of connection with their students and a loss of the ability to answer multiple-step math questions on the board during the class. They turned to Zoom to regain some of this lost connection and used it to regain the ability to work out a math problem visually. The participants’ feelings of gaining back the lost connection are consistent with the research (Parker, 2012; Gibbons-Kunka, 2017), which found live office hours improved communication and decreased the transactional distance between professors and students. The participants told the researcher their transitioned courses were often rudimentary, simple, and the best they could come up with at the time. This was consistent with other studies on pandemic experiences (Johnson et al., 2020). Transitioned courses were not best practices like the pre-pandemic research described (Chen et al., 2018; Khan et al., 2017; Kumar et al., 2019). For example, Kumar and colleagues (2019) described the differences between expert and novice online instructors (see Table 1 in Chapter II, Literature Review), where novice instructors “have subject-matter expertise but fall short of online design” (p.172). The participants admitted that their transitioned courses fell short of expected norms for a well-designed online course; there was not enough time or knowledge acquired during the transition week.

Teacher culture: The participants shared that they felt supported and had a heightened sense of collaboration and community with their colleagues, students, and administration. The participants described how faculty and administration came together (virtually) to support each other and how they attribute this to College A’s culture of collaboration. This sense of community and coming together in support is consistent with McMillian and Chavis’s (1986)
research on the community. The participants were grateful that colleagues shared previously created instructional videos and other online resources and how their administration set up internal websites to house shared resources. Whether or not the faculty were near retiring, they were willing to work hard and change their practice. This is a different finding than the Rupnow (2020) study, which found that those near retirement made minimal changes to their courses, implying they were less invested in making the transition. In addition, as faculty struggled through learning the new tools, their students were often helpful, suggesting ways to improve the course. Students helping with course design was a new phenomenon for faculty.

Past research highlighted the importance of professional development for faculty transitioning courses from face-to-face to online (Olcott & Wright, 1995; Philipsen et al., 2019). In the current study, the participants told me how the college’s Digital Professor Certification coursework was valuable. One participant shared that he used everything he learned on a Tuesday in his class on a Wednesday. Pre-pandemic research (Philipsen et al., 2019) highlighted how transitioning online affects “teachers’ self-perception” and “professional identity”. The participants confirmed this by discussing how their self-perception bottomed out; they doubted their teaching abilities. Their professional identity was in question. One participant expressed this as, “I did not feel like I was teaching”, and another stated, “it felt wrong”.

*Instructional values:* During the interviews, the participants described challenges and changes they implemented in their assessment practices due to the absence of proctored testing. All nine participants expressed a concern about the rise in academic dishonesty, which is consistent with other research from this timeframe (Rupnow et al., 2020). The participants described something new that is specific to mathematics. It is easy for students to cheat at home on math tests. There are numerous free and low-cost mathematics solving websites and cell
phone apps. For example, Photomath is a free app that allows a person to take a picture of a math problem, and instantly the app shows the solution and the steps. The participants described how they changed their assessment practices by making more project-based applied and authentic problems to prevent students from using free apps. Unfortunately, several participants shared how students found ways around this using Chegg, where master tutors would solve an assessment question and provide their paid subscribers with the solution. Participants described their frustrations over the situation and hoped the college would return to on-site proctored testing. For example, Andy told the inner turmoil, “If you assume everyone cheats, can learning still occur?” Seeland and colleagues (2022) confirmed the academic integrity problem in mathematics. They referred to students using the solving sites as a type of “cognitive offloading” (p. 673) from the learning work.

**Findings and Theoretical Model Insights**

The Teacher-Centered Systemic Reform model (Gess-Newsome et al., 2003) was created “based on an extensive review and synthesis of the literature” (p.735), which incorporated contextual factors of structure, culture, and personal contexts and how these mutually influence teachers’ thinking and teaching practices. This study found that the participant data aligned with the TCSR framework (Chapter IV: Alignment of Data to Conceptual Framework). In addition, the participants experienced various emotions when change entered their environment. Some of the feelings faculty discussed were “initial shock”, “fear”, “embarrassment”, and that the transition to online “felt wrong”. The current TCSR framework lacks indicators for this range of emotions influencing teachers’ thinking and practice. The participant data indicates a new *Emotional Context* category is needed in the current TCSR framework. The proposed Emotional Context category is shown in a circle in Figure 3.
Figure 3: Proposed modification to the TCSR model (Gess-Newsome et al., 2003)
Although the current TCSR acknowledges the influence of teachers’ beliefs, it does not recognize the emotional context of change. The new proposed category is needed because any change can cause an emotional response. Even the experts in online teaching shared how they went through professional emotions as they reformed their courses. Their emotional contexts were not due to the shock of the crisis or the extensive learning but instead to the general change. For example, Michael, an expert in online teaching, described how dealing with the closed testing center brought emotions of anger and frustration, which influenced his assessment practices. He changed his assessments from computational to project-based. In addition, the other expert in online teaching and learning (Angela) felt she was “surviving the storm” as she tried to figure out her way forward. She described her feelings as “surviving” even though she was experienced, and the change was straightforward for her. These examples indicate that change is unsettling and often sparks an emotional reaction missing from the current TCSR. These emotions could occur with any reform initiative, such as a new strategic plan, a new LMS, a new textbook adoption, or a new way of teaching.

The proposed Emotional Context category of this study’s five themes as indicators (1) professional emotion challenges, (2) professional learning, (3) teacher culture, (4) pedagogy, and (5) instructional values. For this dissertation, the Emotional Context is placed in a circle to stand out for the reader. If this becomes part of the TCSR framework, the new component could be set within a box.

The new Emotional Context category was placed strategically after Teacher Thinking and before Teachers’ Practice. The reason is that the participants shared how their teachers’ knowledge and beliefs were interrelated with their emotional situation as they decided whether to continue, change or end one of their teaching practices. For example, the participants knew
(teacher thinking) they had to change; it was forced upon them to keep students learning and protect each other’s health. This thinking was then coupled with emotions, such as the emotional contexts of “initial shock”, “loss of connection”, “embarrassment”, “pulling my hair out”, and “I don’t think I can do this”. The thinking with the emotions leads to the change in practice, giving the rationale for the position in the TCSR framework (Figure 3).

This study found that the teacher thinking category was more surface-level than what emerged in the data analysis. The TCSR reform model is viewed as an existing way we do things. The study participants said that the context (COVID-19 environment) challenged the TCSR and caused the participants to move into a new level of understanding. For example, adapting to the new modality required new technology skills which caused faculty to question their pedagogy and usual practice. Now their concept of pedagogy moved to a different place. Also, considering the teacher culture, the pandemic made faculty realize how much they needed each other for support and the sharing of online resources; this was new. Internal turmoil led to how faculty perceived their changes with content and with their students. This led to the proposed change to the existing model.

Some may argue that there are similarities in the proposed indicators with existing TCSR indicators; however, there was enough uniqueness in the emotional context indicators that made the category stand out. The participants spoke of the indicators differently. For instance, teacher culture appears within the TCSR and the new emotional context category. Within the emotional context category, the teacher culture was more specific to the shared situation (pandemic) and shared culture (mathematics).
Participant Recommendations: Thinking About the Future

During the interviews, some participants shared recommendations for how College A could better prepare for a future crisis. The researcher felt that it was important to include these recommendations. Michael and Kelly, the experts in online teaching, recommended the college have a repository of pre-made online courses and teaching materials that could be handed to an inexperienced faculty member. The faculty member would then become a facilitator using the pre-made, well-designed course. Several recommended that all faculty be required to teach at least one online class. This idea would prevent the COVID-19 situation where over 80% of faculty had never taught online. Michael believed the college’s Digital Professor Certification course was good, but it could be much better if it provided more individual coaching in course creation. He felt that some faculty complete the training and do not know how to apply what they learned. Providing a one-on-one mentor to assist the faculty member with course creation would improve the experience for the future students interacting with the course. Also, the current online professional development did not provide follow-through support. Michael questioned, “how many faculty have a good, well-designed course.” In addition, Michael added that he believed some faculty should not teach online because they do not have the skillset and are not as willing as others to make themselves available to students.

Most participants felt that not all students should take online courses. The faculty shared concern that the college does not have a way to screen online students for time management, study skills, and independent learning. All attributes they felt were critical to online student success.
Recommendations for Practice: Thinking About the Future

The researcher reflected on the participant recommendations added findings from all the interviews, and grouped the recommendations into categories applicable to faculty and administrators for future reform or a crisis requiring a rapid shift in modality.

Faculty Recommendations

1. Faculty should acknowledge the professional emotions they are experiencing especially recognizing the stress, uncertainty, and increased workload, and they should be flexible with themselves and their students.

2. Faculty should collaborate with their division colleagues to discuss what is working and not working and share their new knowledge.

3. Experienced faculty should support their colleagues by sharing any previously prepared online resources and be willing to mentor inexperienced faculty through the transition, mainly by providing technical support and best practices advice.

4. Inexperienced faculty should seek help and guidance from experienced colleagues and course designers, ideally in a one-on-one support role.

Administrator Recommendations

1. Acknowledge and support the professional emotions experienced by faculty during the crisis. This includes acknowledging the stress and increased workload that faculty are experiencing. Give faculty time to learn and adjust without assigning new initiatives.

2. Require faculty to attend professional development in best practices for online teaching and learning. Provide one-on-one support in course creation and follow-through support, which should improve the course quality for the students.
3. Work with faculty to build a repository of well-designed pre-made online courses and teaching materials to share in the event of a future crisis.

4. Suggest that all faculty teach an online course once a year to keep their knowledge current.

5. Acknowledge and reward the faculty that helped colleagues by sharing their online resources, personal instructional videos, and technical assistance.

**Recommendations for Future Research**

Several recommendations for future research are considered. First, research the lived experience of part-time faculty during the rapid transition to online teaching. Part-time faculty are traditionally not well paid and may have had less commitment and time for the extensive learning required in a short timeframe. How could colleges support their part-time instructors better in a crisis? Second, explore academic integrity during the pandemic timeframe focusing on math and science faculty experiences in the realm of students testing at home, virtually proctored or not. What effect has this had on student success in follow-on course work, considering the availability of free online problem-solving websites and paid services that will take a test or a course for a student? A quantitative study could explore faculty recommendations in preparation for future transitions. For example, would the faculty want an entirely created online course to use? Would faculty be willing to teach one online course a year to keep their skills? Lastly, further research is needed to confirm the placement of the new emotional context in the TCSR model.

**Conclusion**

This phenomenological study examined the lived experiences of faculty teaching through the COVID-19 pandemic during the rapid shift from face-to-face instruction to online education.
The participants at the state college described the phenomena in five overlapping themes of emotional context: a) professional emotion challenges, (b) professional learning, (c) pedagogy, (d) teacher culture, and (e) instructional values. As shown below, the themes answered the research questions.

Research Question challenges: The pandemic transition created internal turmoil expressed through heightened emotions. The participants experienced difficulties in the amount of work and learning involved in navigating the online environment. Seasoned professionals suddenly felt like awkward beginners, embarrassed as they made technology mistakes in front of their students. Faculty that had previously felt confident, experienced, and at ease in the classroom felt incompetent, vulnerable, and not measuring up to their standards of expertise.

Research Question changes: The participants felt a heightened sense of collaboration with their colleagues and were grateful for shared online resources and the administration’s support. The participants experienced a rise in academic dishonesty and inflated grades and struggled with designing practical assessments when students were testing from home and no longer proctored.

The findings revealed a new category of emotional context to the Teacher-Centered Systemic Reform (TCSR) model. The study filled a gap in the literature regarding math faculty experiences and provided recommendations for both faculty and administrators.
APPENDIX A: COMMUNITY OF INQUIRY
https://doi.org/10.1016/S1096-7516(00)00016-6
APPENDIX B: INTERNAL REVIEW BOARD APPROVAL LETTER
EXEMPTION DETERMINATION

October 18, 2021

Dear Alison Hammack:

On 10/19/2021, the IRB determined the following submission to be human subjects research that is exempt from regulation:

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This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Katie Kilgore
Designated Reviewer

Page 1 of 1
APPENDIX C: EXPLANATION OF RESEARCH LETTER
EXPLANATION OF RESEARCH

Title of Project: The Lived Experience of Faculty in the COVID-19 Pandemic Shift in Instruction

Principal Investigator: Alison A. Hammack
Faculty Supervisor: Dr. Devon Jensen

You are invited to take part in an exciting research study. Whether you take part is up to you.

The purpose of this study is to learn about your lived experiences with the phenomenon of the rapid shift to online instruction during the Spring 2020 COVID-19 pandemic. Understanding your experiences is valuable and may help develop adaptations to future course interruptions and enhance teaching and learning during a crisis.

As a participant, your experiences will be collected through a recorded (audio and video) virtual interview using Zoom with a password protected meeting. The researcher and participant will join the virtual interview from a private location to prevent being overheard. The interview will take less than an hour. The Zoom recording will be used for data analysis.

The researcher will assign a pseudonym to your information so that your answers and data file will be kept confidential. No personal identifiers will be shared in this study. Only pseudonyms will be used on any reports. Only the researcher will have access to the fully identifiable recordings and transcripts. Your data will be securely stored with password protection. Per Florida law, all data collected in relation to the research must be kept for a minimum of 5 years. After which, the data will be destroyed.

You must be 18 years of age or older to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, contact: Alison Hammack, Doctoral Student, Higher Education Leadership, College of Community Innovation and Education, (407) 582-2027, ahammack@knights.ucf.edu or Dr. Devon Jensen, Associate Dean, College of Graduate Studies, devon.jenson@ucf.edu.

IRB contact about your rights in this study or to report a complaint: If you have questions about your rights as a research participant or have concerns about the conduct of this study, please contact the Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901, or email irb@ucf.edu.
Subject: Faculty Experience COVID-19 shift to online

Angela,

It is hard to believe that it has already been over a year since our Spring 2020 COVID-19 rapid transition to online instruction! I want to learn about your experiences in the transition.

You are invited to take part in an exciting research study.

I am doing a qualitative study to understand the lived experience of mathematics faculty during the rapid shift to online instruction due to the COVID-19 pandemic. Your experience is valuable as understanding it may help develop adaptations to future course interruptions.

I would like to collect your experiences in an interview over Zoom that will take about an hour. The interview will be recorded for data analysis. No personal identifiers will be used in this study, and your answers will be kept confidential.

Participants must be 18 years of age or older, full-time faculty with two or more years of teaching experience.

If you are willing to participate, please let me know by replying to this email and indicating if one of the following days/times would work for your interview:

    Thursday, 12/2, 7 – 8 pm or Friday, 12/3, anytime or Monday, 12/6, 9 – 10 am,
    Tuesday 12/7 from 7 – 8 pm or another time during finals week?

If these days and times are not good, let me know, and we will find another one.

Attached is a UCF document [HRP 254 Explanation of Research form] with further information.

Sincerely,
Alison Hammack
Mathematics Professor
UCF Doctoral Candidate
Stanley,

Thank you for agreeing to participate in my research. I look forward to learning about your experience during our upcoming interview. Would you please take a minute and complete this short survey which will allow me to gather some basic information before our interview.

http://valenciacc.ut1.qualtrics.com/jfe/form/SV_8unXI2qyaiQy6PQ

In addition, it would be super helpful if you could take a few minutes and look back at your Canvas courses or old emails from March 2020 to refresh your memory of your pandemic transition experience.

I look forward to seeing you next week, Tuesday, 11/xx, from x – y pm. I have sent you an Outlook appointment, and here is the same link below:
[link added here]

Sincerely,
Alison Hammack
Mathematics Professor
UCF Doctoral Candidate
APPENDIX E: ALIGNED INTERVIEW QUESTIONS
Interview questions aligned with the TCSR framework.

| Personal Contextual Factors (Most of these questions were asked in the pre-interview survey.) | 1. What is your age range? How many years have you been a full-time faculty member? |
| | 2. Pre-COVID-19, had you completed any professional development courses that may have prepared you for teaching online? This may include any course work toward the Digital Professor Certification. |
| | 3. Did you teach mixed-mode or fully online mathematics classes before the COVID-19 pandemic (Spring 2020)? About how many? |
| | 4. Before the COVID-19 pandemic, were you interested in teaching online? |
| | 5. Before the COVID-19 pandemic, had you ever experienced an online course as a student? |
| | 6. Before the pandemic, would you have described your online teaching experience as little to no experience, some experience, or a lot of experience? |
| | 7. Have you completed any courses toward the Digital Professor Certification? |
| | 8. What was your comfort level with Canvas and other online platforms? |
| Teacher Thinking | 9. What were the challenges, if any, you encountered during the 1-week time frame given to convert your courses to online? |
| | 10. Tell me a story about what your transition was like. What was your experience during the rapid transition? |
| | 11. What was your experience in assessing your students? |
| | 12. What, if any, changes have occurred regarding your view of assessment? Why? |
| | 13. Has teaching online during the pandemic changed any of your views or philosophy of teaching? |
| | 14. Is there anything new that concerns you? |
| | 15. Has teaching online changed your views regarding your students and how they learn? |
| | 16. What, if any, long-term effects have the COVID-19 timeframe had on your view of instruction or teaching practices? |
| Contextual Factors of Structure and Culture | 17. How did people impact your teaching experience during the transition period? (President, college leadership, dean, colleagues, course designer, students) |
| | 18. How did people at the institution help or hinder your experience during the pandemic transition? |
| | 19. What types of resources did you find helpful when preparing to shift instruction? (technology, zoom, online platforms) Were there resources that you wished you had? |
| | 20. What, if any, role has professional development made in your preparation or changes to your online courses? |
| | 21. What events or activities have helped or hindered your experience through teaching during the pandemic? |
| Teaching Practice | 22. Describe how the pandemic affected your teaching. How did it impact your assessments? How did it impact your communication with students? |
| | 23. What, if any, changes have you made to your teaching practices? In other words, are there things in your course that you have decided to no longer do, and things that you are now doing that are a change from before the pandemic? |
| | 24. Has teaching online during the pandemic changed your views on course materials or online learning platforms? |
| | 25. What has your experience been with virtual student engagement? Comment on your experience with fostering a sense of classroom community. |
APPENDIX F: COLAIZZI'S PHENOMENOLOGICAL STEPS
Table 1. Steps in Colaizzi’s descriptive phenomenological method

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Familiarisation</td>
<td>The researcher familiarises him or herself with the data, by reading through all the participant accounts several times.</td>
</tr>
<tr>
<td>2. Identifying significant statements</td>
<td>The researcher identifies all statements in the accounts that are of direct relevance to the phenomenon under investigation.</td>
</tr>
<tr>
<td>3. Formulating meanings</td>
<td>The researcher identifies meanings relevant to the phenomenon that arise from a careful consideration of the significant statements. The researcher must reflexively “bracket” his or her pre-suppositions to stick closely to the phenomenon as experienced (though Colaizzi recognises that complete bracketing is never possible).</td>
</tr>
<tr>
<td>4. Clustering themes</td>
<td>The researcher clusters the identified meanings into themes that are common across all accounts. Again bracketing of pre-suppositions is crucial, especially to avoid any potential influence of existing theory.</td>
</tr>
<tr>
<td>5. Developing an exhaustive description</td>
<td>The researcher writes a full and inclusive description of the phenomenon, incorporating all the themes produced at step 4.</td>
</tr>
<tr>
<td>6. Producing the fundamental structure</td>
<td>The researcher condenses the exhaustive description down to a short, dense statement that captures just those aspects deemed to be essential to the structure of the phenomenon.</td>
</tr>
<tr>
<td>7. Seeking verification of the fundamental structure</td>
<td>The researcher returns the fundamental structure statement to all participants (or sometimes a subsample in larger studies) to ask whether it captures their experience. He or she may go back and modify earlier steps in the analysis in the light of this feedback.</td>
</tr>
</tbody>
</table>

APPENDIX G: PRE-INTERVIEW SURVEY
Pre-Interview Survey: Faculty Experience COVID-19 Rapid Shift in instruction

Q1 Thank you for agreeing to participate in my research on the faculty experience in the rapid transition to online teaching due to the COVID-19 pandemic. This short survey will allow me to collect some basic information before interviewing you about your experiences. Your responses to this short survey and the interview will be kept confidential. Please enter your name.

________________________________________________________________

Q2 What is your age?

- [ ] 75 - 84
- [ ] 65 - 74
- [ ] 55 - 64
- [ ] 45 - 54
- [ ] 35 - 44
- [ ] 25 - 34
- [ ] 18 - 24

________________________________________________________________

Q3 How many years have you been a full-time faculty member at the College?

________________________________________________________________

Q4 Pre-COVID-19, had you completed any professional development courses that may have prepared you for teaching online? This may include any course work toward the Digital Professor Certification?

________________________________________________________________
Q5 Did you teach any mixed-mode or fully online mathematics classes before the COVID-19 pandemic (Spring 2020)?

- No
- Yes

End of Block: General

Start of Block: No

Q6 Before the COVID-19 pandemic, did you have an interest in teaching online?

- No interest
- Some interest

Q7 Before the COVID-19 pandemic, had you ever experienced an online course as a student?

- No
- Yes, less than or including about two classes
- Yes, more than three classes

End of Block: No

Start of Block: Yes

Q8 Before the pandemic, would you have described your online teaching experience as:

- little to no experience
- some experience
- a lot of experience

Q9 About how many online courses including mixed-mode and fully online courses had you previously taught at the College?

End of Block: Yes
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