Pedagogic Recontextualization in Health Science Education During a Global Pandemic: Faculty Perspectives on Instructional Adaptations

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Pedagogic Recontextualization in Health Science Education During a Global Pandemic:

Faculty Perspectives on Instructional Adaptations

A Dissertation

by

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This dissertation, submitted by Kara De La Fosse in partial fulfillment of the requirements for the degree of Doctor of Education at Winona State University, Winona, Minnesota, is hereby approved by the committee under which the work has been completed.

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ABSTRACT

Pedagogic Recontextualization in Health Science Education During a Global Pandemic: Faculty Perspectives on Instructional Adaptations (May 2021)

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This qualitative study explored Health Science faculty navigating learning during a global pandemic. Data collection sources for the study comprised individual interviews, individual online questionnaires, and a focus group. The study produced four emergent themes from data analysis of individual interviews, online questionnaires, and the focus group: Faculty Flexibility with Responding to Virtual Instructional Delivery, Shift from Didactic to Conceptual Contextual Learning, Shift in Assessment of Skills and Competency, and Faculty Creativity in Changing the State of Practice Through Course Design. Conclusions from the study established changing pedagogy from a teacher-focused to student-focused approach and employing creativity were paramount with virtual learning. Students and faculty were ill-prepared for assuming an online learning approach after using instruction based on face-to-face pedagogy. Recommendations for future research include conducting a quantitative study of Health Science faculty navigating instruction amid a global pandemic. Obtaining a larger sample size, and
conducting a longitudinal study to explore how challenges evolved and rectified through carrying stages of the pandemic would illuminate challenges and possible remedies for mitigating disruption in future academic settings.
DEDICATION

I dedicate this project to my father, Jerry A. Yorks, and mother, Judith M. Yorks. They chose to adopt my twin sister and me at birth, providing a life of unconditional love and support. Owing all my successes to them, this dissertation is no exception. My father served as a minister and my mother as a schoolteacher. Together, both instilling in me a love for the Lord and my passion for education becoming a life-long learner. Collectively, they both taught me the significance of treasuring family and leading a life of integrity. My mission is to live a life serving the Lord and others with conviction, modeled by them. Thank you for choosing me, loving me, and providing me a life unimaginable. I am forever grateful.
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Words are unable to express my deepest gratitude and appreciation for my dissertation chair, Dr. Holmes, and committee members, Dr. Parker, Dr. Brown, and Dr. Willis. Leading by example, each member transformed me personally, professionally, and academically. Stellar leadership and expertise from the team provided encouragement and support to produce the best work. Thank you for the opportunity to collaborate with you throughout the dissertation; I am honored.
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Chapter 1

Introduction

The 2019 novel coronavirus (COVID-19) outbreak disrupted the educational landscape across the globe. Health Science faculty forced to navigate learning during national stay-at-home orders amid a pandemic endured challenges to meet program objectives that required face-to-face interactions in the classroom, laboratory, and clinical settings (McPherson, 2020). Health Science faculty also faced ethical dilemmas weighing the value of education against learner safety during practicums, clinical rotations, and face-to-face interactions during instruction (Dewart et al., 2020). The clinical component is an integral aspect of the nursing curriculum as it prepares students to be competent in skills, interdisciplinary teamwork, effective written and verbal communication, and applying evidence-based learning from the classroom in practice with direct patient care. The global COVID-19 pandemic has magnified struggles, as nursing faculty are left with no resources to instruct the clinical component mandatory for program completion, as defined by accrediting bodies. Inadequate medical supplies essential for hands-on learning impeded robust instruction (Moyimane et al., 2017).

Statewide, a shortage existed in terms of available medical equipment for training facilities such as colleges and medical establishments (Hilburg et al., 2020). The debate ensued about where to obtain extra medical supplies, and local hospitals became a priority for receipt of any items from companies and local businesses, and individuals that possessed items (Hilburg et al., 2020). An inventory conducted on campuses offering Health Science courses statewide for all medical equipment was required, and surpluses needed to be donated to local hospitals and makeshift field sites. Colleges state-wide were left with no training equipment, including hospital
beds, syringes, intravenous pumps, crash carts, personal protection equipment, and additional essential teaching supplies (Sethi et al., 2020). Adhering to guidelines from the Minnesota Department of Education (MDE), Minnesota Department of Health (MDH), and the Governor regarding best practices promoting safety, including group size limitations and mandated protective equipment, it was impossible to conduct classes when colleges began rephrasing entry on-site. (Sethi et al., 2020).

Faculty adequately preparing health care workers during a global pandemic to deliver patient care safely is critical. Evolving changes during the COVID-19 pandemic required innovative strategies to support continuity of face-to-face teaching, convert to online instruction, and minimize associated hindrances to the learning process (Ali, 2020). Innovative pedagogical approaches to teaching hands-on skills during the pandemic were necessary for online instruction (Pinhero, 2020). However, Mulla et al. (2020) argue that converting activities, assignments, exams, and lectures online may prove challenging for faculty contributing to program success.

In March 2020, national reactions to the COVID-19 pandemic caused abrupt closures of schools, terminating face-to-face instruction (Hanni, 2020). Hodges et al. (2020) assert emergency remote teaching during a crisis moves typical face-to-face instruction to an online platform posing barriers for essential hands-on components in laboratories and clinical settings. In attempts to minimize disruption in the laboratory and clinical setting, virtual technology provides an avenue for learning critical skills and safe-patient care (Madrigal, 2020). While distance learning is not a new pedagogical approach, it is more salient across the nation during the COVID-19 Pandemic (Williamson et al., 2020). Remote learning poses challenges in Health Science Programs when there is little time to deliberate best practices during a pandemic (Willis & Ratcliff, 2020).
Minnesota’s educational landscape changed when the Governor declared a peacetime state of emergency (Karnowski, 2020). Programs stopped instruction temporarily. This interruption would delay new practitioners’ entrance into the professional workforce, where their medical roles are in high demand (Dewart et al., 2020). The Minnesota Department of Health was in dire need of healthcare staff to meet demands from the surge of COVID-19 patients. Pleas for Health Science faculty to leave education roles and transition to bedside nursing were addressed daily from the Minnesota Department of Health and Government officials (Wendt, 2020). Attempts to fill workplace shortages included asking retirees and out-of-state medical providers to seek employment in Minnesota facilities (Dewart et al., 2020). Minnesota Department of Education (MDE) and the Minnesota Department of Health (MDH) monitor statistics regarding the pandemic continually. State and local officials are responsible for determining best practices for faculty and staff based on findings from state regulatory bodies (COVID-19 updates, 2020).

Minnesota Board of Nursing and Minnesota Department of Health mandate face-to-face laboratory and clinical hours to remain accredited and operational, proving problematic with closing schools and clinical partners (Minnesota Board of Nursing, 2020). Clinical facilities shuttered doors to non-essential personnel, preventing students from completing clinical hours to meet program criteria and degree completion (Dewart et al., 2020). Statewide medical certification and licensure exam companies stopped testing in March 2020, posing additional challenges for students to enter the workforce (COVID-19, 2020). Even before the pandemic, critical shortages of healthcare workers existed, exemplifying the importance of removing barriers so students can complete programs and begin employment (COVID-19, 2020). The demand for frontline healthcare workers in acute care and long-term care centers across the state
intensified because of the global pandemic (Dewart et al., 2020). Staff illness from the contagion and underlying health conditions placed individuals in the high-risk category and forced many to take medical leave until a vaccine becomes available (Baseman et al. 2020). Critical staffing shortages in Minnesota decrease patient access to care, increase patient healthcare expenses, and negatively reduce rural hospitals’ ability to deliver complex care with high-tech equipment (Kane, 2020). Moreover, statewide issues trickled down to the local level, and temporarily halted medical education.

In response to colleges locking doors and mandating faculty to work remotely, local Health Science faculty halted instruction for one month over spring break to redesign instructional activities (Institution of study, 2020). The Institution of Study, situated in rural Minnesota, cited valid concerns regarding students’ lack of resources to convene courses online. Surveys dispersed to the student body inquired about access to technology and the internet to identify potential barriers to implementing the online modality (Institution of study, 2020). As a result of responses to the surveys, the school supplied computers and free internet to students enrolled in Health Science programs. This initiative enabled a seamless transition to remote learning; however, the closure of non-essential businesses, colleges, long-term care centers, and acute medical facilities diminished the effectiveness of the college’s action (Institution of study, 2020). Consequently, colleges temporarily halted learning activities until governing bodies provided alternative recommendations (Institution of study, 2020).

Clinical partners of the college programs rely heavily on graduates from the Institution of Study to fill critical workplace shortages. The global pandemic intensified the need for new hires; yet, programs were on hold, thereby rendering the institution virtually unable to meet the demand for new team members (Dewart et al., 2020). The Novel Coronavirus pandemic forced
numerous health care workers and faculty into quarantine, which further compounded staff shortages (Kane, 2020). Health Science faculty considered ethical concerns juxtaposed with best practices with the goal to educate students adequately. Without this type of critical thinking, students may have been placed in harm’s way to meet program requirements when facilities begin to reopen (Dewart et al., 2020).

Health care program directors at colleges relied on solid teamwork to navigate the transition from face-to-face to remote learning. Daily Zoom meetings for healthcare directors with the Minnesota Board of Nursing and Minnesota Department of Health officials provided program instruction (Institution of study, 2020). Transitioning to online learning resulted in a decline in student enrollment because face-to-face learning was the preferred method of instruction (Felice et al., 2020). Students feared working in healthcare facilities would increase their exposure to the virus. Transitioning to emergency remote learning evinced challenges for students and educators in Health Science programs (Button et al., 2014). Conversion to online education required a safe environment that respected students’ diverse needs for optimal engagement and a strong community (Young & Bruce, 2011). Reduction in the number of graduates was another since the community relied upon college graduates to fill shortages in the healthcare setting. At the Institute of Study, budget fears from decreased tuition, coupled with increased expense related to compliance with COVID-19 regulations, posed hardship and additional obstacles. The Institution of Study (2020) implemented a yearlong hiring freeze and examined the loss of employment for departments. Faculty retiring or resigning from Health Science programs left voids for instructors (Institution of study, 2020). Obstacles for adequate staffing further complicated the scenario.
Health Science faculty affected by the global pandemic strive to meet national program requirements by using a remote platform (Mian & Khan, 2020). Because of lack of experience navigating online platforms, Health Science-encountered challenges transitioning to remote learning, were required to contend with technology barriers, and decreased social interaction with students and colleagues (Mulla et al., 2020). Teaching theory online was not the biggest challenge for Health Science educators. Effectively teaching and assessing hands-on skills marked the biggest obstacle (Daniel, 2020). Best practices continued to be threatened by a lack of adequate planning time to devise a robust learning environment for students without the face-to-face component, which is critical in the Health Science field (Kane, 2020). Navigating the learning process during the season of social distancing and closed establishments is the challenge (Hilburg et al., 2020).

Statement of the Problem

Little is known about the educational preparation of Health Science professionals and faculty perceptions of practice and pedagogy while transitioning to remote learning during a global pandemic (Morgan, 2020). Globally, schools endured mass shutdowns as they pivoted from face-to-face instruction to distance learning (Drane et al., 2020). Research suggested that Health Science programs converted theory online with little disturbance, but laboratory and clinical components demanded innovation and strategic planning to obtain program outcomes (Sood, 2020). A gap in the literature existed identifying best practices for faculty in clinical settings promoting teamwork, communication, and real-life applications preparing individuals for the workforce (Bvumbwe et al., 2015). Accreditation bodies governing the Health Science curriculum required strict adherence to policies mandating continuance of programs at the college level. Faculty leading Health Science programs were required to incorporate theory,
laboratory, and clinical components to ensure students’ competencies before program completion. The global pandemic shuttered doors to clinical partners impeding the ability for Health Science faculty to meet required hours of face-to-face direct patient care essential for degree completion (Hilburgh et al. 2020). College administration closed campuses as directed by Government and Health officials eliminating the opportunity to complete mandated hours for the laboratory components outlined in the curriculum (Daniel, 2020). Health Science faculty faced two significant dilemmas resulting from the global pandemic.

The first was changing instructional delivery, formerly requiring face-to-face instruction and observation to assess learning competency in a distance-learning environment (Hilburg et al. 2020). The second concern was navigating learning to meet the mandated laboratory and clinical hours with establishments closed to non-essential personnel (Dewart et al., 2020). In periods of crisis, the most significant error leaders make fears the consequences of wrong decisions. They often remain paralyzed in efforts to advance learning (Netolicky, 2020). Rapid changes minimize deliberation time but demand effective communication in practice (Netolicky, 2020).

**Background of the Problem**

Classroom, laboratory with simulation, and clinical are three characteristic components of Health Science programs nationally. These curricular elements provided students with hands-on learning experiences necessary to become adequately skilled, as these are essential for faculty to teach content standards. Healthcare faculty utilize various pedagogical approaches to teach components necessary to remain in compliance with program standards. A widely used method is introducing concepts in the classroom and reinforcing learned skills in the laboratory setting on realistic mannequins. The exercises focused on critical thinking skills (Blakeslee, 2020). Students must have access to safe environments to enable the advancement of learning at an
individual pace, thereby allowing the student to become proficient before proceeding to the clinical site (Edward & Chukwuka, 2020). Clinical rotations cause anxiety for students. This often decreases performance; however, prior-successful laboratory experiences promote students’ self-confidence (Perng et al. 2020).

Theory in the classroom provides students the foundation for applications explored in laboratory and clinical settings, where students understand the links between theory and practice (Williamson et al., 2020). Nursing education in the classroom must instill knowledge of critical thinking and decision-making skills critical for direct patient care (Walker and Mann, 2016). Clinical experiences are vital in Health Science programs, as they relate concepts and theories to real-life scenarios (Benner et al., 2010). Optimal clinical experiences expose students to high-tech medical equipment and a variety of medical conditions from acute to chronic, spanning across the life cycle (Adjei et al., 2018). Faculty maintain control over learning in the classroom but advancing learning in the clinical setting presents challenges.

Difficulties in clinical settings impede mastery of course objectives. Lack of supervision by preceptors, poor communication between clinical partners and college faculty, and low census counts of patients contribute to the complex issues Health Science faculty, and students must undertake (Atakro and Gross, 2016). Healthcare educators rely on the utilization of the laboratory setting to replace clinical learning when barriers interfere with the learning process. However, simulation in the lab also presents challenges for Health Science faculty, as opportunities for enhanced learning in this environment are not always available. At times, neither clinical settings nor the laboratory is options for continued learning.

Accreditation bodies of Health Science programs pose barriers for innovation and changes during a global pandemic, halting program completion nationwide (Halstead, 2020). At
the state level, Healthcare programs governed by accreditation bodies and the Minnesota Department of Health adhere to federal regulations, which mandate a minimum number of hours with direct patient care to fulfill program requirements (Smith, personal communication, March 12, 2020). The verbiage in the regulations specifies “face-to-face” and “on a live person,” omitting the possibility of utilizing simulation labs or alternative methodologies to remain in program compliance (Wendt, personal communication, April 10, 2020). Furthermore, federal regulations have not been updated over a decade, complicating the dilemma for Health Science faculty instructing during the pandemic on a larger scale (Wendt, personal communication, April 10, 2020). Global pandemics- pose additional challenges as faculty attempt to minimize disruptions of learning critical hands-on skills. The importance of using high-fidelity mannequins when clinical partners prohibit on-site learning provides an opportunity for faculty to assess learning.

The emphasis on simulation in Health Science programs is to bridge the gap between skills, theory, and clinical rotations (Shelby, 2019). Application of knowledge during the simulation requires clinical judgment, reasoning, and prioritization skills essential in Health Science disciplines (Meum et al., 2020). Replicating or creating clinical experiences in the laboratory with the advancement in technology provides alternative learning for Health Science programs.

Faculty customize simulations relevant to the content covered in the classroom related to theory and real-life scenarios. Integrating realistic scenarios in the simulation setting permits faculty to instruct students authentically, connecting theoretical knowledge with practical skills, making sense of the learning (Heaton et al. 2020). Controlled environments in Health Science provide a safe atmosphere for educators to offer instruction about chronic and acute medical
conditions without the potential for patient harm (Boyle et al., 2020). These tactile exercises are beneficial for students, especially because they have opportunities to collaboratively debrief on the experience and continue to hone the critical skills necessary to perform tasks in the field. The debriefing process adds value to the learning experience; and, when carefully devised, follows best-practice guidelines.

Debriefing after simulation experiences and reflection is essential to make meaning from the learning (Lee et al., 2020). Best practices for debriefing in simulation include five criteria to provide value with the learning experience. Criterion one requires competent staff conducting the session. The second aspect entails simulation transpires in an environment that promotes learning, encouraging receptiveness to feedback, maintaining confidentiality. The third suggestion is incorporating faculty that adequately assess student performance and apply areas of concern during debriefing. Fourth on the list is learning applies theoretical frameworks with the learning objectives. Finally, meeting established objectives and outcomes from the simulation experience is critical (Cross, 2016).

Situated learning activities such as simulation and debriefing empower faculty to emphasize critical thinking skills and assess soft skill competencies during the process (Frandson & Christianson, 2020). Reed (2020) argues that the debriefing process facilitates the majority of learning from simulations. Ko and Choi (2020) support simulation in Health Science, asserting the experience also ties in the emotional component experienced in real-life settings. Improving practice is continually a concern for educators to provide robust learning and student experiences. Simulation in Health Science programs during the global pandemic is critical to mold future professionals during times where direct patient care experience is not an option.
The National Council of State Boards of Nursing (NCSBN) currently permits up to 50% of clinical hours in the pre-licensure curriculum to be replaced by high-quality simulation in the Health Science laboratories without negatively affecting student-learning outcomes (Hayden et al. 2014). Flexibility within Health Science programs to fulfill clinical and laboratory training hours provides faculty alternatives to meet program objectives outside of acute and long-term care facilities. The global Coronavirus pandemic presented challenges to faculty conducting alternative training when colleges locked doors to classroom learning and laboratory simulations.

Purpose Statement

The purpose of this qualitative study was to explore the experiences of Health Science Education faculty navigating changes in teaching and learning amid a global pandemic.

Research Questions

To attain the aim of this study, the researcher explored the following research questions:

RQ 1. How do Health Science faculty describe challenges emerging from the transition to online delivery of curriculum?

RQ 2. What pedagogical strategies do Health Science faculty use to transition from face-to-face to online instruction?

RQ. 3. How has the transition to online instruction changed Health Science faculty approach to adapting instruction in laboratory and clinical settings?

Research Design

A qualitative design utilizing a phenomenological approach explored the Health Science faculty’s transition to remote learning during a pandemic. Perceptions and pedagogy were explored to obtain a rich and thorough understanding of the phenomenon. The researcher chose the qualitative phenomenology because it best aligned with the research problem (Creswell,
Phenomenological research designs describe the lived experiences of the phenomenon by the participants in the study (Creswell and Creswell 2018). A qualitative design is chosen for this study because it situated the researcher and participants to interact in a natural setting to generate meaningful descriptions of perceptions and experiences (Creswell and Creswell 2018).

Theoretical Framework

This study was guided by the theoretical framework supporting Health Science faculty’s behavior determining their intent to perform remote teaching from previous face-to-face instruction. E-Learning Theory (2015), the overarching theory for the study, centered on employing online learning instruction at an appropriate level for students and not adding confusion with distractors. E-Learning Theory (Mayer et al., 2015) denotes the quantity of mental exertion involved in working memory. Sweller (2005) asserts that mental effort in the working memory falls into three categories; germane, intrinsic, and extraneous. Germane applies to how students retain their information (Sweller, 2005). Intrinsic relates to how difficult it is for the student to remember the information and performing the task, the instructor has requested (Low and Sweller, 2005). Extraneous cognitive load discusses how difficult the instructor makes the content to grasp based upon how the presentation (Sweller, 2005). E-Learning theory focuses on minimizing extraneous cognitive load and managing intrinsic loads at levels best suited for the learning (Mayer and Moreno, 2003). Reducing the mental effort required to complete the task, and managing the intellectual exertion required to perform the task enhances learning (Mayer et al., 2015).

Fishbein and Ajzen’s (1975) Theory of Reasoned Action is explicitly concerned with behavior and factors that limit the influence of attitudes and behaviors within human action (Trafimow, 2009). It is mainly used to predict how individuals will behave based on their pre-
existing attitudes and behavioral intentions. The Theory of Reasoned Action provides the researcher with a lens through which to study human behavior among Health Science faculty during a pandemic when instructional methods forced changes (LaCaille, 2013). Fishbein and Ajzen conducted research that identified individual behavior was determined by people’s intent to follow through with the action (Trafimow, 2009). The Theory of Reasoned Action drove the research study by understanding faculty perceptions of the changing landscape of instructional delivery and personal intent to comply with mandates. Vallerand et al. (1992) posit attitudes of the behaviors requested and the value placed on subjective norms contribute to changing behaviors.

Mezirow (1991) asserted that obtaining new knowledge, reflecting on past ideas applying to understand, adjusting their worldview, and finding new meaning. Mezirow posited a disorienting dilemma contributes to reevaluating and examining prior conceptions and thoughts promoting change. A global pandemic is deemed a disorienting dilemma directly affecting Health Science Faculty’s perception of curricular adaptations.

Definition of Terms

The following terms were operationalized in this study to offer clarity for the reader.

**COVID-19:** A highly contagious upper respiratory disease originated in Wuhan, China, not previously found in humans that causes symptoms ranging from mild to life-threatening (Centers for Disease Control, 2019).

**Debriefing:** Reflective discussion on the experience and making meaning of the learning by applying the prior knowledge (Fey & Jenkins, 2015).
**Distance Learning:** The technique of learning over the internet in which instructors transmit lectures or demonstrate skills synchronously or asynchronously without participants attending a brick or mortar facility that promotes flexibility for the learner (Moore et al., 2011).

**E-Learning**- Learning that transpires over the internet (Murphy, 2020).

**Emergency Remote learning:** Temporary quick access to instruction during a crisis, shifting to an alternative delivery method (Hodges et al., 2020).

**Face-to-Face:** Being in close proximity and the ability to look at one another directly (Glazier et al., 2020).

**Health Science:** Multi-disciplinary team focused on the delivery of healthcare to humans; knowledge of pure science applied to clinical practices to enhance health and best practices (Public Health Degrees: A Guide to Education & Careers in Health Sciences, 2020).

**Mannequin:** Life-sized doll with proper anatomy that displays vital signs, heart, and lung sounds, enabling students to advance knowledge and practice skills in a non-threatening manner (Kourakos & Kafka, 2020).

**Pandemic:** Large-scale geographical outbreak of an infectious disease with a high prevalence of morbidity and mortality (Madhav et al. 2017).

**Peacetime State of Emergency:** The Governor has the autonomy to exercise powers and receive emergency aid per the state statues lasting an uncertain period (Waltz, 2020).

**Pedagogy:** Synonym for education, guiding the methods and practice of teaching (Black and William, 2018).

**Practice:** Bara & Fuentes (2020) describe educational practice by how faculty perform instructional tasks and observe the rules outlined for the profession to ensure student proficiency
**Recontextualization**: The process of taking something from the original context and reusing it in another context (Altahmazi, 2020).

**Remote Learning**: Faculty and learners are not physically together in the classroom but connect through technology from individual locations and engage in dialogue through discussion boards, online lectures completing exams and assessments with the online platform (Lederman, 2020).

**Simulation**: Dually defined as a learning modality imitating a situation and can be used as an evaluation method (Chavez, 2020).

Significance of the Study

This study may contribute to the limited body of literature regarding the subject of Health Science faculty’s navigating learning during a global pandemic. Additionally, this study may provide future guidance of best practices for converting to online modality to teach and assess skills that determine proficiency. The researcher may convey information that potentially identifies a lack of educational preparation for the pandemic in Health Sciences. Finally, the study may exemplify the necessity of examining current practice and implementing back-up plans when adverse situations arise, which have the potential to alter the traditional methodology of instruction in Health Science programs.

Overview of the Study

This qualitative study consists of five chapters. The first chapter presented the introduction to the study with significant references in relation to Health Science Faculty navigating learning during a pandemic and perceptions of practice and pedagogy. The researcher discussed the pandemic and its impacts on altering education in global, national, statewide, and local contexts. Health Science faculty accustomed to teaching face-to-face in the laboratory and
clinical setting needed to devise robust learning to meet program objectives innovatively. A brief background explaining the evolution of healthcare programs provided the reader with an understanding of challenges posed from the pandemic and business shutting down. Finally, this chapter offered the statement of the problem, the background of the problem, purpose statement, research questions, research design, definitions of terms, and significant arguments signifying the outlook of the study.

Chapter two will present research relevant to Health Science faculty navigating learning while meeting content standards and program outcomes approved by accreditation bodies. The methodology used to conduct the research study will be discussed in chapter three. Chapter four will report the research findings from the study. Chapter five will discuss conclusions, implications for practice, and recommendations for future studies.
Chapter II

Review of Literature

Introduction

The main objective of this study was to explore and provide pertinent research relevant to health science faculty navigating learning during a pandemic addressing perceptions of practice and pedagogy. The literature review identified, investigate, and explored articles related to the present study. The organizational outline of this literature review encompasses six sections. The first section included the historical perspective of health science education. Section two will contain governing bodies of health science programs. Section three will supply an assessment of influences of the pandemic in health science education. The fourth section will present a summary of practices and pedagogies of health science education. Section five will offer a dialogue on curriculum adaptations. Finally, section six will discuss the theoretical connection to the study of Health Science faculty navigating learning during the pandemic.

Historical Perspective of Health Science Education

Health Science Faculty

During the Crimean War, Florence Nightingale reformed healthcare and the quality of care for patients, emphasizing sanitation, and greatly influencing the 19th and 20th-century (Woodham-Smith, 1951). Lack of sanitized environments when treating soldiers with Cholera initiated change in Health Science education by implementing hygiene practices to promote patient safety and reduce death rates (Selanders & Crane, 2012). Florence’s focal point was devoted to direct patient care and less concerned with the theory component (Woodham-Smith, 1951). Hands-on skills and proficiency with nursing tasks promoting safe patient care were of
greater importance than the ability to memorize and recall facts from a nursing textbook (Woodham-Smith, 1951).

Initially, field training in real-time was standard practice until 1860, when Nightingale and Mrs. Wardroper (Superintendent) established the first nursing school at St. Thomas’ Hospital in London (Rivett, 1823). St. Thomas Hospital served as the gold standard and model for nursing education worldwide for decades (Rivett, 1823). Successful implementation of the St. Thomas Hospital nursing school contributed to the founding of The Bellevue Hospital School of Nursing in New York City in 1873 (Lynaugh, 2020). The first Nursing School in the United States, based upon Florence Nightingale’s principles, offered a one-year program for training nurses. Hospital-based nursing programs began to flourish after implementing the school in England and the United States. Connecticut started a nursing program called the New England Hospital for Women, and Boston followed suit with Massachusetts General Hospital (Parsons, 1922).

Incorporating formal Health Science programs in major hospitals initiated a regulation debate regarding hospital certification or national examination being proved as best for a competency career readiness (Parsons, 1922). The Hospital Association established a voluntary register in 1887, vehemently opposed by the British Nurses ‘Association implemented in 1887 (Rivett, 1823). Ethel Bedford Fenwick’s mission was to align the nursing profession to medicine to satisfy physicians and surgeons; however, Nightingale opposed formal registration (Rivett, 1823). Formal competency testing and registry documentation requiring healthcare programs to meet set criteria for student success began in the twentieth century (Selanders & Crane, 2012). Nightingale is attributed to the birth of modern-day nursing. Standards of nursing education students received and care provided to patients evolved from Florence Nightingale (selanders & Crane, 2012).
Over 400 hospital-based nursing schools existed across the United States by 1900 (Lynaugh, 2020). The nursing programs varied in length, and the curriculum taught the primary objective was to provide staffing for the hospital to remain operational (Lynaugh, 2020). In 1909, the University of Minnesota School for Nurses offered the first baccalaureate degree, a three-year program housed in a university (Beard, 1934). The practice changed in 1923, and the gold standard was that nurses should be trained in the academic setting meeting predetermined criteria (Keating, 2014). The Goldman Report and Nursing Education declared emphasis on student learning is paramount to producing nurses to fulfill demands for hospital workers (McBride, 1996). Formalized university-based education served future nurses best to provide stellar patient care (McBride, 1996). Hospital-based nursing programs continued in 1948 to produce new graduates, and The Carnegie Foundations studies nursing education and publishes the Brown Report recommended academic settings for formalized nurse training (Keating, 2014). Focus shifted on associate degree nursing obtained at community colleges by 1975, initiating the decline of diploma programs (Keating, 2014). The National League for Nurses endorsed the Bachelor Degree of Nursing (BSN), a four-year program in 1982 that was quickly adopted by other organizations promoting higher-degree nursing education (Keating, 2014). Establishments began requiring nurses to obtain the degree within a set time frame after hire to meet the gold standard in nursing education (Keating, 2014). Advanced degrees are preferred but not yet mandatory.

Formal healthcare education transpired in hospital-based and hospital-owned schools for the first century; students received instruction in exchange for labor (Lynaugh, 2020). By the end of the 1940s, predominately all healthcare education transpired in the Hospital setting across the world (Keating, 2014). The transition from hospital-based education eventually led to formal
instruction in Community Colleges and Universities (Keating, 2014). Health Science programs have evolved since Nightingales’ contribution to modern-day nursing, proving successful until November 2019 (Lynaugh, 2020). The COVID-19 pandemic posed unprecedented challenges impeding the progression and completion of Health Science programs globally (McPherson, 2020). Waivers of federal regulations and mandates from governing bodies are critical for educators to continue conducting instruction throughout the pandemic (Morin, 2020). The pandemic altered the landscape of nursing education and instructional delivery, calling for national reform of governing bodies of Health Science programs nationwide (Morin, 2020).

Governing Bodies of Health Science Programs

Governing bodies of Health Science programs conduct regular on-site visits to ensure program standards are obtained, and compliance is adhered to determining approval (Minnesota Department of Health, 2020). Program directors remain accountable for meeting expectations and requirements for individual programs outlined and established by government bodies and accreditation establishments (Minnesota Board of Nursing, 2020). The Institute of Study receives accreditation by the Higher Learning Commission (HLC) and is accountable to demonstrate college programs meet course objectives identified in the master course outlines (Institution of Study, 2020). To maintain accreditation, the Institute of Study undergoes site visit year four and ongoing based upon the pathway plan the institute has chosen with Higher Learning Commission to ensure compliance (Institution of Study, 2020). Peer-reviewers engage in dialogue with a staff liaison from the Institution of Study to inform colleagues of needed changes. Higher Learning Commission examines personnel files to ensure all faculty and staff are up to date on annual learning modules and in good standing. Individual programs endure review to assess learning outcomes and course objectives to verify students are receiving an education to prepare them for
a professional role adequately (Higher Learning Commission, 2020). The final component of site-visits is to meet with faculty and interview to obtain personal feedback regarding support extended for faculty, staff, and students (Higher Learning Commission, 2020). Based on observations during the site visit, the Higher Learning Commission submits a final report of criterion not met that the Institute of Study must rectify by a set date to remain in good standing and operational (Institution of Study, 2020). The global pandemic halted the face-to-face site visits, and faculty met via Zoom Spring 2020 (Institution of Study, 2020). Difficulty existed, demonstrating the experience Health Science faculty extends to students in the simulation laboratory and hands-on learning that transpires via Zoom (Sood, 2020). Minimal areas of concern were raised; however, Health Science faculty are diligently attempting to address and ensure the Higher Learning Commission robust learning environments exist (Institution of Study, 2020).

Minnesota Board of Nursing (MNBON) oversees the following Health Science Programs, Practical Nursing, Associate Degree Nursing, and the Nursing Assistant Home Health Aide Program (Institution of Study, 2020). Minnesota Board of Nursing mandates a specific number of laboratory and clinical hours (128) in long term care centers and acute settings before completing programs and obtaining approval to sit for the National Council Licensure Examination (NCLEX) and practice in the field of nursing (Spector et al., 2018). Faculty assess student knowledge and skill sets by return demonstration in the laboratory to ensure competency before providing direct patient care (Bowling et al., 2018). Face-to-face direct patient care provides experience building rapport, engaging in multidisciplinary teamwork, and effective verbal communication (Price, 2020).
Minnesota Department of Health (MDH) oversees Nursing Assistant Home Health Aide Programs statewide. Federal regulations require 96 hours of classroom and laboratory time face-to-face (Wendt, 2020). Programs must also provide a minimum of 16 clinical hours in a long-term care center as faculty directly observe students completing a list of required skills (Wendt, 2020). Faculty must observe students demonstrate skills in the laboratory setting on mannequins and peers, verifying competency before advancing to the clinical environment (Minnesota Department of Health, 2020). Minnesota Department of Health mandates full attendance, proficiency with all 60 skills, and cumulatively obtaining a 78% in theory to complete the approved program (Brown, 2017). Certification testing comprises a written and skills test after program completion to be entered on the Nursing Assistant Registry for the state (Pearson Vue, 2020). Certified Nursing Assistants are necessary to work in long term care and acute settings (Terrace, 2020).

Accreditation Commission for Education in Nursing (ACEN) is the accreditation body for the practical nursing and associate degree nursing programs at the Intuition of Study. Benefits of accredited Health Science Programs include; student recruitment, federal and state funding eligibility, required for matriculation into advanced programs, and ensures competent practitioners as students’ progress into professional roles (Halstead, 2020). Accreditation Commission for Education in Nursing has six criteria that the Nursing program must uphold to remain accredited (ACEN, 2020).

Standard one: examines the mission and administration to ensure the delivery of content meets program outcomes. Communities of interest shall remain updated to program success rate, proposed changes, and provided the ability to share feedback from personal standpoints. The
Institution of Study conducts biannual advisory board meetings to address standard one with stakeholders that were halted because of the global pandemic (ACEN, 2020).

Standard two: ensures adequate faculty and staff are adequately qualified in the didactic, laboratory, and clinical settings (ACEN, 2020).

Standard three: focuses on student policies within the nursing program that are congruent with governing bodies (ACEN, 2020).

Standard four: the curriculum supports student learning outcomes and program outcomes in alignment with safe patient care (ACEN, 2020).

Standard five: adequate resources are available for students, including library accessibility, sufficient technology, physical and fiscal resources (ACEN, 2020).

Standard six: ensures program outcomes are consistent with the learning outcomes accompanying the nursing program’s approval (ACEN, 2020).

National Council of State Boards of Nursing (2020) updated changes affecting Health Science programs nationwide to overcome barriers presented with the global COVID-19 pandemic. Educational establishments and clinical facilities stopped training medical students during the pandemic impeding program completion without the ability to meet mandatory clinical hours (McPherson, 2020). The Minnesota Board of Nursing (2020) acknowledged unprecedented circumstances needing addressing to enable Health Science the ability to produce highly qualified individuals in periods of high demand. Before the onset of the COVID-19 pandemic, the Minnesota Board of Nursing (2020), permitted up to 50% of long-term care or acute clinical rotations to be replaced with simulations in the laboratory setting on campus. The sole purpose was to accommodate snow days and low-census patients at the hospital, providing students enhanced learning experiences (Bowling et al., 2018). Rapidly evolving changes with
the pandemic and statewide facility closures, the Minnesota Board of Nursing (2020), permitted the use of a 1:2 ratio to supplement clinical rotations unable to be conducted on-site at facilities. Nursing rule variances established protecting programs across the state of Minnesota, enabling program completion (Minnesota Board of Nursing, 2020). As the pandemic grew with intensity and longevity was observed, the main objective with higher education programs was to achieve Minnesota rule 6301.2340 Subp 3. The nursing education program must “provide a curriculum to enable the student to develop the competence necessary for the level, scope, and standards with the type of licensure.” (6301.2340). Providing flexibility for Health Science programs to meet accrediting body mandates extended still leaves uncertainty on how to employ innovative approaches to create robust learning (Morin, 2020).

Influences of the Pandemic in Health Science Education

**Pandemic Imposed Challenges for Health Science Programs**

Dr. Ghebreyesus, the Director of the World Health Organization, sounded the alarm in March 2020 about the novel Coronavirus (COVID-19) global pandemic originating in Wuhan, China, in December 2019 (Smith-Schoenwalder, 2020). Haffajee and Mellow (2020) declare the virus a hazard to the economy and expressed how federal governments instituted emergency powers safeguarding the well-being of individuals altering academia worldwide. COVID-19 is a respiratory disease with the rapid airborne transmission, lacking a prophylactic, cure, or vaccine, causing schools and businesses to shutter doors across the globe (Kissinger, 2020). The uncertain etiology of the disease was highly debated leading to unclear guidelines for treatment and containment, abruptly disrupting education. The Centers for Disease Control (CDC) and World Health Organization (WHO) identify person-to-person transmission of the virus via respiratory droplets, typically from coughing or sneezing, which frightened school officials (Kissinger,
The virus also spread through tainted inanimate objects after touching mucous membranes, including eyes, mouth, and nose, further complicating the education arena (COVID-19 Overview, 2020). Public health officials panicked, as COVID-19 was more contagious than influenza sharing similar clinical manifestations challenging medical professionals with proper diagnosis and treatment plans (Duszynski, 2020). Cough, fever, myalgia, nausea, rhinorrhea, and dyspnea are the most commonly reported complaints, yet, numerous additional symptoms correlate with the illness (Nobel et al., 2020). Symptoms and severity of the illness entail asymptomatic (no symptoms), mild (common cold symptoms), or critically ill; organ failure, respiratory failure, and septic shock (Lou et al., 2020).

The Department of Health announced symptoms of infection present two to fourteen days after initial exposure affecting the respiratory and gastrointestinal systems (Nobel et al., 2020). School officials were distressed knowing individuals may be contagious one to three days before the onset of symptoms presents from the highly infectious virus and debated about best practices to continue learning and optimizing safety protocols (Haffajee and Mellow, 2020). Challenges with COVID-19 include the rapid transmission from pre-symptomatic persons at exponential rates exemplifying difficulty to mitigate spread to others (Gates, 2020). Cases as high as 50% attribute to pre-symptomatic and asymptomatic individuals spreading the disease (Gandhi et al., 2020). The United States first confirmed case of COVID-19 January 21, 2020, was reported in Washington, and reaction on March 13, 2020, prompted the federal government to declare a national emergency, closing businesses and schools nationwide (Tang and An, 2020). Health and Government officials attempted to flatten the curve of infected folks nationwide, issuing stay-at-home orders to socially distance people from spreading the contagion halting education (Mendelson, 2020). The United States Federal Government initiated the Coronavirus Aid Relief
and Economic Security (CARES) act March 27, 2020, providing grants to educational institutions to aid in disruption from the pandemic (Storey and Slavin, 2020). School officials sought guidance from the Centers for Disease Control (CDC) and the federal government to respond to the pandemic (Binkley, 2020).

Nationally, schools were closed by the end of March with mandates to resume remotely within a matter of weeks to deliberate the remaining school year plans safely resuming education (Story and Slavin, 2020). Initially, schools intended to remain closed for two weeks, but the prevalence of faculty and students infected with the virus increased, requiring further deliberation on best practice (Forgie, 2020). Schools petitioned the federal government for waivers on mandatory hours and days necessary for the academic year (Jones and Pflaum, 2020). Suspension of standardized testing and entrance exams for higher education for the remaining academic year (Strauss, 2020). The realization that students would not return face-to-face for the remaining academic year was quickly determined. Educators assumed additional responsibilities adapting the curriculum online to provide synchronous instructional lessons (Sparks, 2020). Turner et al. (2020) and Sparks (2020) asserted educators were frustrated with inadequate planning time during unprecedented and frightening times attempting to minimize disruption in learning with new modalities.

Kamenetz (2020) argues that rapid conversion online was a monumental accomplishment for faculty and administrators utilizing current resources and new approaches for learning. Minimal disruption in learning was paramount to enable degree completion and graduation (Sawchuk, 2020; Sparks, 2020). Remote learning required schools to disseminate technology devices and Wi-Fi hot spots or internet connection (Goldstein et al., 2020). Concerns arose by locating adequate supplies and timely distribution during national shortages (Mangrum, 2020).
The pandemic significantly disrupted medical programs reliant upon face-to-face learning, altering instruction requiring innovative techniques to deliver rigorous and robust learning experiences (Hilburg et al., 2020). Medical students are vectors between clinical rotations, and transferring contagions to others, further complicating education, making safety paramount (Ahmed et al., 2020). Rapid onset of the pandemic poses profound repercussions for educational settings, especially medical programs (Ahmed et al., 2020). Naciri et al. (2020) and Ahmed et al. (2020) posit academic challenges with long-term implications will persist, including reduction in national exams, quality of education and less qualified graduates entering the professional workforce. Dr. Woolliscroft (2020) argues COVID-19 virus disrupted and transformed education abruptly, forcing educators to depend upon innovations available yet neglected in years past (Woolliscroft, 2020). Health Science faculty, administrators, and students endured challenges in academia during the pandemic requiring reconstruction of curriculum and assessments with a no harm approach for students (Sood, 2020).

**Pandemic Challenges for Health Science Administration**

Health Science administration endured challenges from the rapid conversion to online learning from face-to-face modality (McPherson, 2020). Although remote learning is not a new concept for higher education, nursing programs rely on the face-to-face component for instructing skills in the laboratory and clinical rotations, flourishing communication, and prioritization skills (Mian and Khan, 2020). Making impulsive decisions during a global pandemic warrant consideration about future implications and effects imposed on students and faculty members in the programs (Morin, 2020). Willis and Ratcliff (2020) identify guidance regarding altered landscapes suggesting regular and clear communication with team members, offering advice and flexibility with support to adapt to required changes. Leadership teams must
remain mindful of faculty barriers intensified from the COVID-19 global pandemic and challenges to continue instruction with a lack of adequate resources (Onyema et al., 2020). Willis and Ratcliff (2020) mention the challenge of preparing faculty not adept with technology and the need for mentors offering continual support and guidance throughout the process. Administration personnel participating in weekly meetings with the Minnesota Department of Health, Minnesota Board of Nursing, and campus pandemic committees are left with no time to provide support to faculty transitioning through program changes (Institution of Study, 2020).

The administration assumes responsibilities from the COVID-19 pandemic assisting faculty contending with short and long-term disruptions in planning, low self-confidence, faculty shortages, and ensuring the safety of faculty and students (Singh and Haynes, 2020). Complexities with faculty and technology barriers have increased administration workload and stress during the transition to the online modality (Cloyd and Thompson, 2020). Ensuring compliance with organization accreditation standards and innovative strategies to preserve programs in good standing with a lack of uncertainty during continual evolving changes from the pandemic (Mian and Khan, 2020). Leadership must also focus on student retention during periods of high-stress levels in programs that mandate face-to-face interaction during a period of highly contagious respiratory illness (Onyema et al., 2020). The financial impact from reduced enrollment, onboarding new staff replacing individuals that left the profession because of the high-risk status, and additional expense purchasing personal protective equipment and medical-grade cleaning supplies to resume operations safely (Singh and Haynes, 2020).

**Pandemic Challenges for Health Science Educators**

Health Science faculty endured challenges from the pandemic that required reconstruction of courses and programs to meet outcomes. Jesionkowska et al. (2020) advanced
the notion changing the mode of instructional delivery was not the sole concern Health Science faculty contend with, and the focal point should remain on the quality of online education. Lack of student-teacher interaction amongst Health Science programs resulting from the global pandemic required faculty to devise a robust online environment that was well organized, clearly defined achievable learning objectives, and synchronous online courses (Jesionkowska et al., 2020). Disruption from COVID-19 hampered the demonstration of critical hands-on skills and assessments faculty utilize to determine student proficiency (Daniel, 2020). Health faculty were particularly alarmed due to intimate knowledge of viruses and the immune system (Miller, 2020). Novel Coronavirus was perplexing for medical leadership teams and instituting best practices across the country (Poitras, 2020). Health Science faculty deliberated benefits versus risks contending with the contagion and how to protect faculty, students, and patient interactions during clinical rotations when permitted to resume (JH Bloomberg School of Public Health, 2020). The CDC announced guidelines for social-distancing, implementation of masks, and enhanced cleaning for establishments. Uncertain of the trajectory with spread and prevalence of the infection, fear of overwhelming hospitals was alarming. Health faculty remained mindful of a potential second and third wave with no prophylactic measures available for protection (Poitras, 2020).

Responses to the pandemic halting face-to-face instruction and closure of clinical sites demand the governing bodies provide an exemption of the 50% replacement rule to enable program completion (Hilburg et al, 2020). Simulation in the laboratory setting has been an option; however, with colleges closed, strategic innovation is essential (Morin, 2020). Health Science faculty obtain training to lead simulation to be prepared for enhanced learning environments to mimic realistic scenarios in low stake settings (Forneis et al., 2015).
Requirements for simulation educators entails adequate and ongoing training in the use of simulation and debriefing to provide valuable learning for students (Bailey, 2019). Mukhtar et al. (2020) conducted a qualitative case study consisting of Health Science faculty transitioning to the online modality during the COVID-19 pandemic suggesting that students become self-directed learners throughout the process. Mukhtar et al. (2020) elaborated further, revealing medical faculty were ill-equipped to instruct psychomotor skills online, and disruption from the Coronavirus pandemic hindered communication useful for assessing learner understanding of subject matter. Real-time interactive dialogue provides faculty the opportunity to clarify uncertainty and promote self-efficacy and motivation to continue learning (Boyle et al., 2020). Barriers, including internet connectivity issues and inadequate bandwidth, disrupt instruction and prove problematic when faculty are demonstrating online (Drane et al., 2020).

Emergency remote teaching and the abrupt shifting instructional delivery online during the COVID-19 global pandemic exemplified a lack of adequate technology resources for faculty and students and migrating to the online platform (Mohmmed et al., 2020). The Institution of Study situated in rural Minnesota posed internet connectivity challenges when utilizing voice-over PowerPoints, instructional videos, and recorded lessons attempting to disseminate learning. Lynch (2020) affirmed the fact that twenty-seven percent of rural inhabitants lack sufficient broadband speed to receive adequate high-quality connections with numerous family members streamlining simultaneously. Problematic when both parents are working remotely, and multiple children within the household all require an internet connection to achieve work and school demands (Hilburg et al., 2020). Removing the possibility of asking students to record hands-on skills typically demonstrated in the laboratory setting to assess proficiency was not an option for the Health Science faculty (Spector et al., 2018). Cahapay (2020) and Toquero (2020) conducted
similar studies focused on social distancing and remaining at least six feet apart from others remaining critical concerns for Health Science faculty outlined. Practicing skills with peers in the laboratory setting on campus no longer was an option, and individuals residing alone were at a more significant disadvantage of learning in addition to the new online platform (Mian and Khan, 2020). Health Science faculty were left deliberating on how to assist students matriculating through programs without disrupting in education and program completion (McPherson, 2020).

**Pandemic’s Impact on Students**

Health Science faculty and administration face personal and professional challenges with the COVID-19 pandemic; students also need support from educational leaders during challenging times. The notion of students’ mental health negatively affected by the pandemic is supported by the research of Pragholapti (2020), recommending school and government officials provide crisis-oriented psychological services. Stress, anxiety, Post Traumatic Stress Disorder (PTSD), depression, and suicide are primary concerns for students during the pandemic (Pragholapti, 2020). A qualitative phenomenological approach using 15 interviews discovered four emerging themes were negative emotions, excessive hand hygiene, fear of family health, and financial hardship imposed from the virus (Pragholapti, 2020).

Cao et al. (2020) conducted a quantitative study on medical students during the pandemic and the psychological effects experienced. To best equip educators with student trauma from the pandemic, the study aimed to examine student mental status, the theoretical basis for interventions from faculty, and governmental guidance for instructional institutions (Cao et al. 2020). The study included 7,143 participants rating emotional symptoms using a Likert scale and providing demographic information (Cao et al. 2020). The study found 75.1% of the
participants displayed no anxiety, and of the remaining percentage, 21.3% was severe anxiety, and the rest reported mild anxiety (Cao et al., 2020). Further examining the reports of anxiety were attributed to financial constraints and academic delays from the pandemic (Cao et al., 2020). Student fears correlated with concerns academic leadership expressed with decreased enrollment and completion rates.

A qualitative study of 33 nursing students completed an online form sharing perceptions and experiences related to studying during a global pandemic (Lovric et al., 2020. All students praised faculty leadership during the pandemic, exemplifying the significance of stellar leadership when contending with personal fears from uncertainty (Lovric et al., 2020. Thirteen participants expressed a decrease in concentration and learning, identifying needs for faculty to reexamine expectations with assignments and lessons to ensure course objectives are met by all students (Lovric et al., 2020). Participants identified concerns with attending clinical rotations, transportation, and housing, potentially increasing the risk of exposure of COVID-19 and not having adequate protective measures instituted to feel safe (Lovric et al., 2020). Similar findings were noted by students fearful of contracting the virus outside of the home and infecting family members (Cao et al., 2020).

Colleges closed doors during the pandemic requiring faculty to work remotely, and students engage in distant learning secluded from the normal face-to-face instructional delivery method. Adapting to stay-at-home orders imposed additional stressors on students already contending with financial concerns and fears of not finishing programs (Lovric et al., 2020). A cross-sectional study was conducted with 307 nursing students using questionnaires electronically since meeting face-to-face was not permissible (Celik, 2020). Life satisfaction and social competency were issued examined with nursing students 82.7 percent of students
expressed negative adaptions to the stay-at-home orders, and 68.6 percent struggled with their financial status, consistent with a study performed by (Cao et al., 2020) of college students. Similarities are present with studies conducted by previous studies as all participants expressed fear and concern for contracting the virus and infecting family members at home (Celik, 2020). Health Science faculty and administration must remain aware of consistent student fears to alleviate concerns to enhance learning during the pandemic (McPherson, 2020). As faculty, diligently work to reconstruct learning and program structure, students’ fears and concerns must be equated. Concerns were identified with nursing students when a longitudinal observational study on 207 nursing students was conducted assessing changes in sleep patterns during the COVID-19 pandemic affecting learning (Celik, 2020). Blanco et al., (2020) conducted a longitudinal study of 207 nursing students, which identified struggles with stress, anxiety, depression, and sleep disorders imposed from the COVID-19 pandemic. Findings are consistent with studies conducted by Cao et al., Celik, 2020; Lovric et al., 2020. Differences noted from (Blanco et al., 2020) reported the decreased sleep levels lowered academic performance and required faculty to adapt lessons around students’ changed sleep patterns. Limitations identified from the study failed to identify potential risks to the virus, which might have affected research study results (Blanco et al., 2020).

Research identifies students are affected by the pandemic academically and emotionally, and instructional methods alter comprehension and critical thinking skills (Pragholapti, 2020). Lack of engagement in the classroom with traditional teaching approaches is problematic for student success (Onyema et al., 2020). Faculty rely on remote learning during the pandemic, but students display negative perceptions of the modality attributing to additional emotional stress (Rohman et al., 2020). Faculty navigating learning during the COVID-19 pandemic contend with
negative connotations of distant learning coupled with research proving traditional learning methods hinder academic progression (McPherson, 2020). Faculty must employ creativity to actively engage students in learning during the pandemic with a modality less than desirable to many individuals and little time to prepare instruction (Mian & Khan, 2020). Sleep disturbances in nursing students during the pandemic adversely affect academic performance (Blanco et al., 2020). Romero-Blanco et al. (2020) conducted a longitudinal observational study on 207 nursing students to understand sleep pattern changes during the pandemic and influences on academic performance. Findings included students’ sleep quality decreased during the pandemic impeding academic performance requiring educators to alternate class times and assignments to meet the demands of students’ changed sleeping patterns (Romero-Blanco et al., 2020).

**Education Post Pandemic**

Morin (2020) argues that education moving forward will assume new platforms, guidelines for instruction, assessing, and engaging students in Health Care programs nationwide. Orchestrating clinical and laboratory learning requires implementing technology which adversely affects students with restrictions from an internet connection and access to devices. Regulatory and governing bodies must approve virtual experiences replacing face-to-face learning experiences faculty implement (Spector et al., 2018). The American Association of Colleges of Nursing (AACN) (2020) advises reexamining curriculum focusing on infectious diseases, mitigating spread, and health promotion to meet the current demands from the health crisis.

Topics including quarantine, containment, hand hygiene, and respiratory etiquette, replacing the current content specific to specialties that would best be moved in graduate coursework (Morin, 2020). Lengthening Health Science programs are proposed to continue with the current curriculum enabling the proposed amendments added (Morin, 2020). Specific courses
previously instructed throughout a semester could be condensed to a seven-week course (Morin, 2020). Telehealth and telemedicine have remained prominent amid the global pandemic and are the future of health currently. To sustain a viable avenue for providing care for patients, incorporating the topic in curriculum to remain relevant is necessary. Adequately preparing future healthcare workers to meet innovative approaches to deliver healthcare is paramount.

The life-threatening contagion has negatively affected student enrollment and marketing of Health Science programs requiring adoptions to promote registration (Loveric et al., 2020). Examinations are moving to an online proctoring service to enhance test integrity but add extra expense and stress for students and colleges (Morin, 2020). Onyema et al. (2020) identify five effects of school closures from the pandemic institutions are struggling to contend and rectify. Interrupted learning, lack of adequate nutrition, inequality to digital learning and devices, social isolation, and increased pressure to remain open (Onyema et al., 2020). Education will remain altered from the global pandemic requiring deliberation on best practice ensuring a safe learning.

**Practices and Pedagogies of Health Science Education**

**Shifting Pedagogies in Health Education**

Within the health education field, nursing educators are preparing for the unique challenges related to training the next generation of care providers (Dewart et al., 2020). Due to the unprecedented risks to students and faculty, many academic nursing programs removed students from clinical practicums and simulations laboratories as safety measures. Health educators had to shift teaching pedagogy from a hands-on approach to remote virtual instruction. Traditional nursing pedagogies utilizing the teacher-centered approach where the focus is on the instructor lecturing as students absorb content without active engagement (Brown et al., 2008).
Memorization and recall is the central point measuring success, removing comprehension, and critical thinking components critical for Health Science programs (Chen et al., 2014). Employing traditional pedagogies reduce collaboration and teamwork; both are detrimental to enhancing interpersonal and communication skills necessary in the medical arena (Harris et al., 2014). The teacher-centered approach places sole responsibility for the Health Science faculty to instruct content to assure students will learn (Feller, 2018). The belief exists that if faculty do not address the subject matter, the students will not understand it. Horsefall et al. (2012) suggests transference of theory content from a positivist form places the viewpoint that every student will share identical results. Toothaker and Taliaferro (2017) utilized a phenomenological study of thirteen students in a nursing program instructing with traditional pedagogies to understand the effectiveness of the instructional methodology. Toothaker and Taliaferro (2017) asserts interviews resulted in findings of being disengaged in the learning process, desiring a more interactive approach, and questioning the focus for memorization.

PowerPoints are visual aids representing phenomena and models in Health Science programs to supplement and enhance learning (Smith et al., 2019). Models enrich understanding when discussing anatomy and physiology, cellular structures, or the molecular makeup of pharmaceuticals. Hashemi et al. (2012) listed the benefits of PowerPoints in the classroom; it supports various learning styles, electronic format is distributed easily to students with visual or auditory barriers, and they are attractive to learners. Worku (2019) asserted that PowerPoints add to the didactic landscape of the schoolroom, and the illustrations facilitate learning. PowerPoints typically include the medical condition, pharmacological treatments, alternative treatments, non-pharmacological approaches, nursing implications, side effects from medications, and nursing assessments for the patient (Worku, 2019). Comprehensive programs such as Nursing are unable
to adequately prepare students for the National Council Licensure Examination (NCLEX) and advancement into practice capturing all content on PowerPoint slides (Hashemi et al., 2012). Traditional pedagogies in Health Science programs incorporated research papers and objective testing to assess learning from lectures and assigned readings (Smith et al., 2020).

Clinical rotation in long term care settings and acute settings are standard practice in Health Science programs (Spector et al., 2018). Clinical learning intends to enhance psychomotor skills, incorporation of competency with application from theory to practice (Ko and Choi, 2020). Greater than 50% of the Health Science learning environment transpires in the clinical setting providing irreplaceable experiences critical for professional and academic success (Pai, 2016). Clinical experience provides a robust, complex, and challenging learning environment to promote critical thinking skills. Clinical experience provides essential hands-on practice, but observation and mentorship exposure enhance the cognitive skills necessary for practice (Pai, 2016). Observation encompasses two methods; careful observation and reflective observation, both contributing value to the clinical experience (Dreifuerst, 2012). Careful observation enables the student to examine what and how the preceptor or instructor is doing (Dreifuerst, 2012). Reflective observation empowers the student to ponder what the preceptor or instructor is doing to gain deeper meaning from the learning experience (Cazzell and Anderson, 2020). Reflection promotes critical thinking skills and the ability to comprehend and rationalize the learning experience (Cazzell and Anderson, 2020). Active learning during clinical rotations enables the faculty to provide immediate, constructive feedback and guidance to enhance the learning experience (Rafiee et al., 2014). Clinical faculty and student rapports engaging in positive relationships contribute to encouraging learning experiences (Chan et al., 2018; Curl et al., 2016). The clinical portion of Health Science programs is pass or fail with no letter grade
assigned (Numminen et al., 2014). Faculty members determine the competency of performance by assessing the ability to obtain a set of vitals accurately, perform a medication pass, completed a head to toe assessment, and the students’ ability to make sound clinical judgment employing critical thinking skills (Numminen et al., 2014). Patient safety is the main priority, and if the instructor deems the student places the patient at harm, immediate dismissal from the clinical site and failure of the program transpires.

**Changes in Health Science Education**

Initially, the scope for nurses was to maintain asepsis technique and simple tasks, including medication administration and assistance with Activities of Daily Living (Rivett, 1823). Hands-on experience in real-time settings proved beneficial for mastering skills, making sound clinical judgment and prioritization but not conducive to critical and competent care necessarily (Keating, 2014). The 1950s in healthcare focused on diverse patient needs ranging from chronic to acute illnesses and delivering high-quality care to patients (Lynaugh, 2020). Health educators quickly recognized shadowing preceptors and adherence to policy and procedures was not sufficient (Keating, 2014). Competency and critical thinking skills were lacking, exemplifying the demand for change in safe healthcare education delivery (Keating, 2014).

World War II was a turning point changing the landscape of healthcare delivery because of unsafe care provided demanding higher-level of formal education to train workers (Selanders & Crane, 2012). Hospital administration, physicians, and community members advocated for rigorous training programs before delivering direct patient care to sick individuals (Parsons, 1922). In 1873, three nursing educational programs based upon Florence Nightingale principles initiated organized and professional nurse education programs in the United States (Relisa,
Nurse training programs became standard for healthcare education by 1900, comprised of theory and on-site clinical experience lasting between two and three years (Keating, 2014). Healthcare education transitioned to receipt of a diploma, and practitioners could enter the professional workforce upon program completion (Beard, 1934). Health science education continued instructional delivery in this fashion until the mid-twentieth century (Beard, 1934). Health Science leaders enriched the profession by requiring state licensing boards and an increase in theory instruction during classes and mandated clinical and laboratory hours (Relias, 2015). Changes in nurse training programs transpired again to meet standards of the nurse practice act, professional nursing associations, and content to best prepare students to pass the licensure exam (Lynaugh, 2020).

**Laboratory and Simulation Learning**

Collaboration amongst students, and actively engaged in learning enhance knowledge and application in nursing education (Padilha et al., 2018). Experiences in the laboratory participating in simulations and clinical rotations aid in developing safe and high-quality standards in health care before direct patient interaction (Forneis et al., 2015). Nursing faculty rely on resources in the laboratory and clinical setting to enhance learning concepts taught in the classroom applicable to real-life scenarios (Cazzell and Anderson, 2020). Laboratory and simulation learning halted during the pandemic leaving Health Science faculty perplexed on mitigating disruption of critical hands-on content and essential skills necessary for program completion (McPherson, 2020).

Historically nurses trained in real-time on patients on the battlefield until the twentieth century when advancement in resources provided alternatives to practice (Zac, 2015). In 1911, Mrs. Chase was the first life-sized mannequin tailored for Health Science programs featuring
joint hips, knees, elbows, and shoulders replicating a real-life patient (Zac, 2015). Three years later, Mrs. Chase was upgraded and became equipped with injection ports and internal reservoirs for the enhancement of instruction (Zac, 2015). Advancement in technology contributed to mannequins having simulated breathing capability and heartbeats, including cardiac dysrhythmias so that healthcare professionals could enrich training in areas students might not be subjected to in clinical rotations (Zac, 2015). By the 1970s, the evolution of mannequins became computerized, having male and female anatomy, the ability to expel body fluids, blink, and cry, improving Health Science faculty teaching (Zac, 2015). High-fidelity mannequins gained attention for nursing programs providing faculty a safe environment conducive to learning and practicing without fear of patient harm (Cloyd and Thompson, 2020). Faculty guide learning experiences across the life-span utilizing mannequins and provide experiences students might not gain in real-life settings (Ko and Choi, 2020. The National Council of State Boards of Nursing (NCSBN) conducted studies on education with mannequins in the laboratory compared to clinical rotations in the acute or long-term care setting (Hilburg et al, 2020). Results proved that the learning experience with the mannequins in the laboratory was more meaningful compared to the on-site clinical rotation with real patients (Brewer, 2011). The study further indicated that pass rates on the National Council Licensure Exam (NCLEX) results were not affected by replacing simulation for clinical experiences (Brewer, 2011). Aebersold (2013) describes nursing simulation as an opportunity to replicate real-life experiences with a controlled, guided, and safe atmosphere to reinforce instruction from the classroom. Best practice regarding nursing simulations in the laboratory setting entail assigning roles with students consisting of charge nurse, floor nurse, family member, and medical provider. Instructors assign prep work to prepare students for the simulation experience requiring students to study medications and disease states
that apply to the scenario. During the simulation experience, the facilitator has predetermined objectives and proficiencies for the students to endure (Aebersold, 2013).

Best practice standards for simulation-based education include the strategy of the scenario aligned with theory content, adequate guidance, thorough debriefing, continual assessment of students, clear objectives identified, and outcomes tailored to the learning achieved (Bailey, 2019). The International Nursing Association for Clinical Simulation and Learning (INACSL)’s mission is to employ health care simulation in a safe environment to prevent patient harm. International Nursing Association for Clinical Simulation and Learning (INACSL) Standards Committee (2016, December) provides eleven criteria identified to serve as a framework to design simulations assured to meet desired program outcomes. The criteria outlined by INACSL are evidence-based, providing fundamentals of practice in the classroom, clinical setting, and guiding research.

1. Criterion one: determine the necessity of learning experience for the simulated learning exercise. Need assessments are based upon surveys from stakeholders and components essential for devising simulation to enhance classroom and clinical experiences (INACSL Standards Committee 2016).

2. Criterion two: customize learning objectives to promote student readiness to advance in clinical settings. The predetermined objectives should drive the design of the simulation experience (INACSL Standards Committee, 2016).

3. Criterion three: devise objectives that are measurable and achievable as the facilitator assists students in navigating the purposeful learning experience based upon the needs assessment. Predetermine when the facilitator ends the simulation experience based upon the patient (INACSL Standards Committee 2016, December).
4. Criterion four: adequately devise a simulation scenario that supports the objectives and outcomes desired from the learning experience. The utilization of scripts in simulated learning experiences promotes consistency, validity, and reliability (INACSL) Standards Committee (2016, December).

5. Criterion five: create a realistic simulation experience with props and accessories. Realistic simulations engage students more, providing optimal learning experiences (INACSL) Standards Committee (2016, December).

6. Criterion six: address designing a realistic simulation experience, so the learning is meaningful and relatable to the content and meets desired objectives. Ensure the nurse educator is qualified to lead the simulation experience (INACSL) Standards Committee (2016, December).

7. Criterion seven: pre-brief before the simulation to identify what Health Science faculty expect students to prepare before the simulation experience and expectations throughout the learning process (INACSL) Standards Committee (2016, December).

8. Criterion eight: debrief after the simulated learning experience. Debriefing provides a rich and meaningful reflection of the simulation and the ability to identify areas of needed growth and aspects performed well throughout the learning experience (INACSL) Standards Committee (2016, December).

9. Criterion nine: evaluation of the simulation experience enhances the learning experience. Formative, summative, and high-stakes evaluations are options to assess learning and feedback (INACSL) Standards Committee (2016, December).
10. **Criterion ten**: Health Science faculty should assign a prep pack before the simulation experience and adequate resources to enable successful implementation and learning (INACSL) Standards Committee (2016, December).

11. **Criterion eleven**: perform a dress rehearsal before going live with the simulation experience. Test materials and mannequins to ensure functionality and workout potential unintended errors before students engage in the learning experience (INACSL) Standards Committee (2016, December).

A descriptive correlational quantitative study conducted by Cazzell and Anderson (2016) measured clinical thinking and the impact of clinical judgment utilizing a Health Science Reasoning Test (HSRT) assessed by the Lasater Clinical Judgment Rubric (LCJR) during the simulation experience. The Health Science Reasoning Test measures reasoning and decision-making processes (Facione, 2020). The Lasater Clinical Judgment Rubric evaluates students’ achievement of learning outcomes and performance of skills (Yang et al., 2019). Cazzell and Anderson studied 160 nursing students examining clinical thinking during a simulation based on pharmacology and medication administration to determine clinical judgment during the procedure. Findings of the study revealed Health Science faculty must instruct deductive reasoning for complex clinical scenarios. Faculty must devise simulated learning experiences strategically for the development of deductive reasoning skills and clinical judgment opportunities so that learning can flourish. Bailey (2019) elaborated further and revealed that simulation-based learning experiences promote critical thinking skills, self-efficacy, verbal communication skills, and safety when the Health Science faculty devise the learning environment based upon the eleven criteria INACSL provide. Bailey (2019) asserts that gaps in nursing simulation research include the level of adherence to INACSL standards and how
instrumental faculty serve as facilitators. The literature gap is significant during the global COVID-19 pandemic as Health Science faculty diligently attempt to utilize resources accessible to higher education facilities to continue producing highly skilled medical students (Hilburg et al., 2020). Rapid transformation to employ simulations leave barriers to train faculty adequately and ample time to devise simulations according to the eleven criteria outlined by INACSL (McPherson, 2020).

Debriefing after simulations is a critical component that enhances the learning experience and applying meaning to the experience. Verkuyl et al. (2020) argue that debriefing provides the opportunity for students to reflect on the learning experience and apply connections to make a more profound understanding. Identifying learning gaps from the classroom to the laboratory settings provides students the ability to focus on aspects needing further development. Forneis et al. (2015) conducted a quantitative study examining debriefing after simulated learning experiences to reflect upon the knowledge and create more profound, more meaningful experiences. Debriefing and dialogue after the simulation experience aids with critical understanding components intended from the simulation experience. The Debriefing for Meaningful Learning (DML) model creates new meaning after reflecting upon the simulated learning experience (Dreifuerst, 2012). The study included 153 students from four nursing programs with pre-test and post-test in determining the effectiveness of debriefing to assist with clinical reasoning abilities (Forneis et al., 2015). Half of the faculty utilized the Debriefing for Meaningful Learning (DML), and the other half of the faculty did not incorporate the concept after students completed the simulation (Forneis et al., 2015). Findings from the study students debriefed with the Debriefing for Meaningful Learning (DML) model scored considerably higher on the post-test compared with the other group led by faculty (Forneis et al., 2015). Faculty
modifying instructional designs using active learning and engaging students are requiring comprehension and cognitive and affective learning disciplines (Mian and Khan, 2020). Simulation in the laboratory assists faculty to meet primary objectives identified in the nursing education curriculum to best meet patient needs and provide safe care. (Lee et al., 2020). Meaningful simulated learning experiences must encompass the best-practice guidelines outlined by INACSL (Cazzell and Anderson, 2020). Faculty overwhelmed with a global pandemic, rapidly converting courses online leave minimal time to devise simulations meeting best practice standards (McPherson, 2020).

**Virtual Simulations and Clinical Experiences**

Innovative initiatives during the global COVID-19 pandemic assist Healthcare programs to meet program objectives was the implementation of virtual nursing care clinical rotations (Cloyd and Thompson, 2020). Pedagogical practices using technology produce a learning atmosphere where students learn through examination and not content consumption (Konrad et al., 2020). Clinical rotations in acute and long-term care settings are the gold standard; however, theory to practice gaps exist, leading to catastrophic patient outcomes (Bvumbwe et al., 2015). Cloyd & Thompson (2020) list the benefits of virtual clinical: enhancing technology skills essential for medical professionals, teach critical thinking and prioritization skills, patient safety practices, and a safe environment to demonstrate bedside nursing abilities. Virtual clinical opportunities enable students to review and refine skillsets at individual paces.

Virtual simulation is emerging with the global pandemic, and a lack of research studies exist in the present moment; however, studies conducted affirm virtual reality simulation outcomes meet or exceed face-to-face simulations performed in the Laboratory (Rourke, 2020). Virtual simulation enhances Health Science education by employing options to engage learners to
participate in the patient scenario, reflect upon the experience, and to identify essential practice changes for future interactions (Rourke, 2020). Additional benefits include increased clinical decision-making skills, prioritization, and applying theory into practice (Padilha et al., 2018). Virtual life-like patients promote student providing decision making through initial diagnoses and treatment for the patient. Virtual simulation offers immediate feedback on students’ decisions caring for patients, independence, and inspiration to continue learning; all aspects nurse educators desire to instill in students (Kang et al., 2020).

Padilha et al. (2018) discussed an exploratory, descriptive, and cross-sectional study using a quantitative approach with a sample size of 246 pre-graduate nursing students. The study aimed to explore student perspectives of virtual simulation to determine how meaningful the experience was and if students endured apprehension and stress (Padilha et al., 2018). Students participated in the virtual simulated learning experience, and researchers held a structured briefing with demonstration and 22 debriefing sessions in total (Padihla et al., 2018). Upon completion, students completed a two-section questionnaire. Part one inquired about sociodemographic aspects, and part two was a 10-point Likert scale with eight questions concerning ease of the simulation and value from the learning (Padihla et al., 2018). The data collection transpired over two months, and 87% were female, and 13% male participants and the study determined students felt at ease with online simulation, and the experience was valuable to learning (Padihla et al., 2018). Conclusions from the research supported high motivation from students to partake in complementary resources for Health Science programs.

Assessing critical-thinking skills from the virtual simulation is a valid concern for nursing faculty to ensure students achieve course objectives (Cloyd and Thompson, 2020). The research design consisted of a pre-test and a post-test with 47 students participating in the study (Kang et
al., 2020). The course design entailed a 90-minute orientation on virtual simulation followed by a four-day class held weekly ending with students completing simulations on maternal nursing, child nursing, and adult nursing content (Kang et al., 2020). Virtual simulations lasted approximately 30 minutes with additional time for pre-briefing and debriefing afterward. The research study assessed critical thinking abilities from the virtual simulation utilizing 27 questions with Likert style format and three open-ended questions (Kang et al., 2020). Findings indicated virtual simulation assisted with self-directed learning, a safe environment, and critical thinking skills developed from the experience (Kang et al., 2020). Two studies identified from student perspectives demonstrate virtual simulation provides meaningful experiences in a safe environment conducive to learning when face-to-face laboratory and clinical sessions are not an option (Kang et al., 2020).

High-fidelity mannequins cost $70,000 on average, where virtual simulation is less expensive, and the National Council of State Boards of Nursing permit up to 50% of clinical hours to be replaced with simulation (Aebersold et al., 2018). Further findings indicate simulation replacing clinical rotations do not impede pass rates on the National Council Licensure Examination (NCLEX) or lack of critical thinking skills (Aebersold et al., 2018).

Smith et al. (2020) conducted a qualitative descriptive study with seven nursing faculty utilized open-ended questions to determine challenges posed from the rapid transformation to online education in Health Science programs.

Health Science faculty from community colleges struggle the most with inexperienced students and online education conversion (Hilburg et al., 2020). Research indicated that nursing education is high-stakes as faculty diligently attempt to teach real-life applications online, preparing them for life and death scenarios (Smith et al., 2020). Verkuyl and Mastrill (2017)
conducted a scoping review that examined virtual simulation in nursing education and findings indicated experiences were enjoyable, motivating and engaging. Aebersold et al. (2018) conducted mixed-method study on virtual simulation that indicated students’ perceived experience of virtual simulation motivating and engaging. Varkuyl and Mastrill (2017) reported one negative consequence of virtual simulation; students reported missing the interaction with the mannequin in the laboratory setting. Radianti et al. (2020) identifies a gap in the literature identifying the most effective virtual reality simulation in healthcare education. Virtual simulation provides a short-term solution during the pandemic, but challenges will present for Health Science educators transition back on campus for face-to-face learning. Resuming face-to-face learning poses concerns with a lack of supplies essential for medical programs to effectively teach since they are in high demand during the pandemic and unavailable Ranney et al., 2020). Government Health officials shared best-practice with the public and businesses to prevent transmission of disease, leading to supply shortages and price gouging, further crippling businesses’ ability to regain operations safely, extending business closures, and working from home (Gates, 2020). Personal protective equipment (PPE), including gloves, hand sanitizer, medical-grade masks, isolation gowns, face shields, and goggles, were in high demand are selling out globally (Ranney et al., 2020). Health Science programs struggle with adequate teaching supplies and materials to keep faculty and students’ safe while on campus, adhering to safety plans necessary to resume face-to-face learning (Hilburg et al., 2020). Guidelines and state-mandates to mitigate the virus include wearing facemasks, social distancing (at least six feet apart from others), frequent hand hygiene, and limit contact with individuals (WHO, 2020). Challenges will exist for faculty to lead instruction adhering to the mandates outlined by the
government officials and health care leaders (Spector et al., 2018). Greater challenges exist for students in the midst of the pandemic impeding learning and program completion (Morin, 2020).

**Remote Delivery**

The transition to remote learning altered instructional delivery systems in higher education and traditional faculty were ill prepared to make an abrupt shift in pedagogical practice (McPherson, 2020). It was particularly challenging for Health Science faculty due to the embedded face-to-face components in prepare health practitioners (Hilburg et al., 2020). De Jong (2020) noted transitioning to remote learning is not merely equivalent to moving previous face-to-face lessons online without requiring skills and training faculty was not qualified to implement. De Jong (2020) further points out that online learning has existed for decades; however, faculty in Health Science relies on instruction in front of the class with group dialogue and return demonstration. Ensuring concepts are understood is difficult to assess with online modality. Critical hands-on learning approaches across Health Science disciplines require one-on-one assessment with return demonstration to properly evaluate proficiency (Williamson et al., 2020). Instructors are responsible for sending competent individuals into the workforce to provide care for patients (Boyle et al., 2020).

The closure of brick and mortar higher education establishments and halting face-to-face interaction and changing pedagogical approach required efficiency optimizing resources available for a flawless transition (Ali, 2020). Challenges present from distant learning and individuals not having access to technology, adequate bandwidth, network issues, and distractions are impeding success in Health Science programs (Morgan, 2020). Onyema et al. (2020) conducted a quantitative study employing a survey design, including 200 educators, to identify barriers hindering engagement with online modality during the global pandemic. Lack of
resources, including the laboratory setting and loss of student interest and engagement in programs, were emerging themes (Onyema et al., 2020). The digital divide and lack of skillset utilizing technology hurt online education (Onyema et al., 2020). Equity concerns are generated from the transition to online learning, and the process is complex without the expedited nature during a global pandemic (Ali, 2020).

Jayalath et al. (2020) conducted a descriptive survey methodology, questionnaires and in-depth interviews administered to 90 teachers to gain a deeper understanding of factors that influence the transition to online modality during the COVID-19 global pandemic. Jayalath et al. (2020) posit lack of steady internet connection, necessary troubleshooting steps, and access to technology personnel are the immediate measures faculty can assess to assist with a seamless transition online. Successful implementation converting to online learning requires an active presence online with frequent feedback to provide a sense of community and belonging within the virtual classroom (Jayalath et al., 2020). The study concludes emphasizing challenges faculty endured with the online landscape encouraging students to interact with the faculty and peers, exemplified by Health Science faculty throughout the mandatory conversion to online courses (Jayalath et al., 2020).

Nursing students reliant upon face-to-face lectures and demonstrations were placed at a disadvantage in a period of high stress from the COVID-19 pandemic (Mian and Khan, 2020). Faculty were dependent upon video recordings to teach hands-on skills, which merely demonstrated techniques. Recordings available differed from standards the Health Science program expects from performance serving as a challenge (Hilburg et al., 2020). Incompetence to demonstrate psychomotor skills online proves challenging for Health Science faculty, especially when students are lax in sharing feedback regarding understanding or comprehension.
of skills being taught (Mukhtar et al., 2020). In addition, faculty and students did not have access to the materials necessary for practicing or measuring proficiency (DeJong, 2020). Educators creating online courses should reevaluate the learning objectives and intentionally create learning modules with information and materials so students can meet the goals (Martin et al., 2019). Assessments and evaluation online require additional precautions to protect test integrity and student veracity with academic performance (Martin et al., 2019). Mukhtar et al. (2020) conducted a qualitative case study at a medical institute, a sample size of 12 faculty members using an interview guide providing recommendations to purchase proctoring software to prevent and detect cheating during online exams.

**Practices Utilized in Health Science Learning**

The flipped classroom approach has learners be active participants within the classroom, emphasizing dialogues, and interactions contributing to higher-level critical thinking abilities (Jensen et al., 2017). Student-centered approaches encourage the application of knowledge from the classroom setting into practice. Synchronous class sessions are devoted to active learning activities promoting problem-solving skills and application of knowledge (McLaughlin et al., 2014). Placing responsibility on students to learn theory materials before the synchronous class enables the instructor to guide classroom activities, reinforcing the content. Active based learning in the classroom geared towards problem-solving, application, and synthesizing materials maximizes student–faculty interaction (Jensen et al., 2017).

A Quasi-experimental study conducted in 2016 compared results from two groups; one using traditional learning and the second using a flipped-classroom approach by employing a pretest-posttest design (Dehghanzadeh, 2018). Results supported increased critical thinking skills with the flipped-classroom approach, actively engaging students before and during class to
extend the learning (Dehghanazadeh, 2018). Chu et al. (2019) conducted a separate Quasi-experimental study utilizing a pretest-posttest of 151 nurses evaluating self-efficacy in the flipped classroom with evidence-based nursing compared to the traditional based learning style. Results indicate self-efficacy and enhanced knowledge are evidenced by employing the flipped classroom approach (Chu et al., 2019).

Case studies guide in teaching evidenced-based practice designing realistic scenarios in a learner-centered teaching environment eliciting critical thinking skills to produce optimal patient care (Kaylor & Strickland, 2015). Quality and Safety Education for Nurses (QSEN) identify unfolding case studies as beneficial for experimental teaching in a safe, controlled environment (Kaylor & Strickland, 2015).

Concept maps assist in sharpening critical thinking and judgment skills by purposefully recognizing, graphically display, and connecting crucial concepts by establishing and scrutinizing data (Bessington et al., 2018). Concept maps enhance critical thinking skills in novice nurses and develop knowledge of the clinical scenario (Gerdman et al., 2012). Potgieter (2012) explained the concept maps guide with improving critical thinking skills through active learning as faculty facilitate the learning exercise. Health Science faculty assign a disease or condition being studied and engage students in active learning (Potgieter, 2012). The illness or condition belongs in the center of the diagram, and students’ web out identifying treatments, side effects, nursing implications, risk factors, and assessments necessary to provide safe patient care holistically (Gerdman et al., 2012). Concept maps promote critical thinking about the nursing process; assessment, diagnosis, planning, implementation, and evaluation (Bessington et al., 2018). Concept maps assist with integrating theory into clinical practice and viewing the whole picture (Potgieter, 2012).
A mixed-methods quasi-experimental design study conducted by (Bessington et al., 2018) examined concept maps to strengthen the relationship from theory to practice promoting meaningful learning and critical thinking abilities. Forty students participated, twelve engaged in concept mapping, and twenty-eight in traditional style teaching methods. Results from the study support concept maps that create meaning from learning and link theoretical and clinical knowledge (Bessington et al., 2018).

**Pedagogy in Health Science Education**

Teacher-centered learning approaches have been effective for Health Science faculty but innovation with technology demands new educational approaches (CITE). Evolution with communication, technology devices and educational modalities meet the diverse needs of learners in Health Science programs more effectively. (LeBlanc, 2017). Narrative pedagogy and sharing stories enhances learning promoting empathy, comprehension, empowerment of students entering the Health Science profession and enhancing practice and discipline (Wadsworth et al., 2017). LeBlanc (2017) conducted a retrospective qualitative analysis on 108 student narrative reflections based upon themes from 2015-2016. Findings yielded emerging themes including vulnerability, questioning and moral concerns all contributing to augmenting nursing profession and practice developing strong nurse leaders (LeBlanc, 2017). Weimer (2011) ascertains aspects where teacher-centered approach is evidenced in the classroom: The teacher dictates content learned, remains in control of classroom balance, and is responsible for learning and evaluation.

Student-centered learning approach is widely utilized across Health Science disciplines empowering students by serving as a guiding their intellectual development journey (Wright, 2011). Students remaining in control of their learning by remaining actively engaged and demonstrated increased prevalence of completing college having academic control of individual

**Curriculum Adaptations**

Adapting the curriculum, learning outcomes, and course content for the duration of the global pandemic is critical to reducing the stress that situational factors impose on learning (Hughes et al., 2020). A study consisting of 39 participants teaching in Health Science programs provided emerging themes for adapting curriculum during a pandemic. 1. Faculty must evaluate the prior experience of students with remote learning (Hughes et al., 2020). Rohman et al. (2020) asserted that students have derogatory preconceptions with online learning and impede academic success. Transition to online instruction is mandatory, exemplifying the significance of ongoing technical support promoting success. 2. Realign objectives based on essential skills and knowledge at present; remain mindful of stress imposed from the pandemic (Hughes et al., 2020). Remaining focused on the current world needs during the pandemic to promote health and safety, and environmental hygiene should be central in the revised curriculum (Toquero, 2020). Essential skills in Health Science programs entail hand hygiene, mitigating transmission with appropriate personal protective equipment, identifying clinical manifestations, and proper treatment. Health Science programs are encouraged by (Hughes et al., 2020) to incorporate the COVID-19 pandemic into the curriculum to apply real-life health crisis promoting public health and health promotion since revisions and adaptions are transpiring. 3. Consider life situations of students and the significance of education during the pandemic, and remain a facilitator and motivator (Hughes et al., 2020). Tempski et al. (2020) relates the Kubler-Ross grief cycle to the
pandemic and encourages educators to understand individual states students are in and how resilient to persist with learning.

**Theoretical Framework**

Three theories guided this research study and served as a foundation for the inquiry regarding health science faculty navigating the transition to remote learning. Behaviorist learning theories focus on individual (teacher-centered) characteristics that guide and are influenced by behavior, knowledge base, skill sets, personal attitudes, and beliefs (Hagger, 2019). Health science faculty being receptive conforming to the nationwide mandate altering the landscape of education varies based upon individual beliefs.

**E-Learning Theory**

E-Learning Theory (Mayer 1997) founded on The Cognitive Load Theory (Sweller, 2005) denotes to the quantity of mental exertion involved in working memory. Sweller (2005) asserts mental effort in the working memory falls into three categories; germane, intrinsic, and extraneous. Germane applies to how students retain their information (Sweller, 2005). Intrinsic relates to how difficult it is for the student to remember the information and performing the task the instructor has requested (Low and Sweller, 2005). Extraneous cognitive load discusses to how difficult the instructor makes the content to grasp based upon how the presentation (Sweller, 2005). E-Learning theory focuses on minimizing extraneous cognitive load and managing intrinsic loads at levels best suited for the learning (Mayer and Moreno, 2003). Reducing the mental effort required to complete the task and managing the intellectual exertion required to perform the task enhances learning (Sweller, 2005). During the global pandemic Health Science faculty rapidly pivoted from face-to-face learning to online modality relying on electronic devices to instruct students (McPherson, 2020). Mayer (2003) posit audio narration enhances the
virtual learning experience versus text on the screen. Further suggesting that learning is enhanced employing two concepts, audio, visuals or text than utilizing all three or one modality independently (Mayer, 2003). Permitting the learner to build off existing knowledge reduces cognitive load and increases focus on expanding knowledge (Mayer, 1997). Eliminating distractions during the instructional presentation such as music, graphics etc. permits focus to remain on pertinent content (Sweller, 2005). Guidelines for presenting content online suggest highlighting important text, introducing smaller portions of content to not overwhelm the learner, strategically placing text and accompanying graphics in close proximity (Moreno and Mayer, 2007). Enabling the learner to individualize learning pace with controls to advance or rewind to view content proves beneficial with online learning for self-paced activities to meet needs of diverse learners (Sweller, 2005).

The Theory of Reasoned Action developed in the late 1960s by Fishbein, focused on individual behavior and intent to execute the performance requested (Merlin, 2020). The theory aimed to assist with understanding the relationship between attitudes and behaviors influencing human action (Hew, 2019). Prior research continually failed to support the belief that individual attitudes determined behaviors (Hagger, 2019). Continued acceptance of the false impression contributed to Fishbein and Azjen revising and expanding theory in 1975, confirming no sound evidence proved attitude determined an individual’s behavior (Karnowski, 2018). Theorists researched previous studies attempting to understand attitude and behavior, arguing the
relationship should exist (Hew, 2019). Theorists proposed intention to perform an act was essential for an individual’s behavior and underpinned the framework for the Theory of Reasoned Action (Merlin, 2020). Additionally, the Theory of Reasoned Action is the dominant framework for examining challenges explicitly concerned with conduct and factors that limit influence or attitudes determining conformation (Page & Cole, 1985).

Theory of Reasoned Action identifies behavioral intention attributing to actions displayed (Trafimow, 2009). The intention is an individual’s readiness to perform tasks requested is most critical for adopting the behavior (Dahl et al., 2018). The intent to conform relies upon attitude towards the behavior and subjective norm of others (Gehlert & Ward, 2019). Beliefs about the outcomes and consequences of the desired action promote attitudes towards the behavior (Trafimow, 2009). Attitude and subjective norms determine behavioral intent, contributing to individual behaviors with varying influence based upon value to the decision-maker (Sardegna et al., 2018). Attitudes encompass two components, the evaluation and the strength of a belief (Karnowski, 2018). Subjective norms include normative beliefs and motivation to comply. Normative beliefs are perceptions that others expect from personal actions (Fishbein, 2008). Motivation to comply is driven by how vital others’ standpoints are of the decision chosen and actions displayed. Motivation to comply with social norms depends upon individual willingness to follow social pressures and how important it is to adhere to others’ expectations.

In addition, the theory of Reasoned Action aligns with Health Science faculty navigating learning during a pandemic and receptiveness to mandates altering instructional delivery. Heath Science faculty are cognizant of the agent (coronavirus), host (humans), environment (community, clinic, hospital, college, homes), motivating the judgment to comply with the changing educational landscape (Raingruber, 2013). Faculty alarmed with the contagion and
rapid transmission reinforces compliance with local, state, and government officials’ request to amend the educational landscape (Hua et al., 2020). Attitudes and beliefs surrounding the global pandemic vary amongst individuals; however, personal intent will be the determining indicator of behaviors ultimately displayed by the Health Science faculty (Ahmad et al., 2020). External variables of the Theory of Reasoned Action include personality traits and demographics, ultimately affecting faculty behavior (Fishbein & Ajzen, 2011). Residing in a rural community, a false sense of security existed with reluctance to comply with guidelines believing the virus was problematic only in large cities (Ajilore, 2020). Institutional leadership-based decisions regarding limited face-to-face contact and smaller groups according to demographics with the pretense of immunity in rural areas (Morehouse, 2020). The evolving pandemic required frequent alterations in practice and pedagogy based upon the latest recommendations from the Centers for Disease Control and the Corona Virus Task Force. (Ajilore, 2020). Exhibiting intent to meet program requirements throughout the pandemic is critical, and indicative Health Science faculty will display behaviors essential for successful outcomes (Trafimow, 2009).

Figure 2

*Theory of Reasoned Action*

<table>
<thead>
<tr>
<th>Theory of Reasoned Action</th>
<th>How important others' perceptions are of the behavior/ Motivation to comply</th>
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<tbody>
<tr>
<td>Individual's belief about the outcome</td>
<td></td>
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<tr>
<td>Attitude towards the behavior</td>
<td>Subjective norms</td>
</tr>
<tr>
<td>Behavioral intention</td>
<td>Behavioral intention</td>
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<tr>
<td>Behavior</td>
<td>Displayed</td>
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</tbody>
</table>
**Transformative Learning Theory**

Obtaining new knowledge and reflecting on past ideas applying to understand and adjusting their worldview and finding new meaning defines Mezirow’s Transformative Learning Theory developed in 1978 (Mezirow, 1991). Mezirow conducted a study on females returning to the workforce after a long absence observing assimilation into the professional employment scene again, and the transformation occurred in ten phases (Mezirow, 1978). The following are the ten phases:

1. A disorienting dilemma
2. Self-reflection of anxiety, responsibility, irritation, or humiliation
3. Assessment of expectations
4. The realization that dissatisfaction and the method of transformation is common
5. Investigation for new experiences, associations, and engagements
6. Deciding the progression of achievement
7. Gaining information for skills and fulfilling the desired goal
8. Temporary experiencing new roles
9. Establishing proficiency and self-assurance in new associations
10. Assimilation into the new life based upon the new perspective

Christie et al. (2015) asserted points of view and stances are ingrained in unconscious minds making it challenging to alter personal standpoints, often requiring a disorienting dilemma forcing behavioral change. Mezirow (1991) argued that disorienting dilemmas require individuals to self-examine, assess, and recognizing discontent and transformation is not an isolated occurrence. Exploring new roles and planning changed actions, establishing self-confidence is necessary to transform behaviors in congruence with Transformative Learning Theory (Christie et al., 2015).
Application of Transformative Learning Theory towards healthcare faculty evaluating curriculum while seeking confirmation that critical thinking transpired through content, application, and premise (Christie et al., 2015). Making a mental and behavioral shift is critical when applying the Transformative Learning Theory (Christie et al., 2015). Online modality proves challenging Health Science faculty to meet accreditation mandates while conveying knowledge and assessing student knowledge (DeJong, 2020).

In the Health Science programs, the curriculum is decided upon by faculty to prepare students to enter the workforce adequately skilled (Mian and Khan, 2020). Faculty embarking upon new methodologies to convey content, especially regarding historically face-to-face hands-on skills, is challenging during the pandemic (Mian and Khan, 2020). Cabaniss (2014) asserts that transformative learning focuses on individual actions and stances motivating decisions by discovering understanding and values basing conclusions. Mezirow (1991) argued that situations arising not in alignment with an individual’s existing belief of the scenario forces reexamination of the new experience would reshape individual standpoints. Critical reflection from dialogue with other attributes to the changed behavior (Forneris et al., 2020).

Application of the Transformative Learning Theory in Health Science courses exists as students apply life experiences and pre-existing knowledge (Hilburg et al., 2020). Educators are unable to convey knowledge directly to students without students’ fully transforming existing knowledge specific to the content of instruction (Cloyd and Thompson, 2020). Changing perspectives is not always a rational process, and the Theory of Transformative Learning recognizes that aspect (Cabaniss, 2014). Reluctantly might exists when being asked to contemplate, assess, and revise assumptions based upon scenarios (Cabaniss, 2014). Abandoning
current practice and beliefs are challenging, exemplifying the importance of providing a rewarding environment conducive to instruction (Cloyd and Thompson, 2020).

Figure 3

*Theoretical Connection to the Study*

**Summary**

Included in this chapter was a comprehensive review of the historical perspective of Health Science Education and governing bodies guiding program implementation. Next, the global COVID-19 pandemic is discussed and challenges posed on Health Science Programs, including administration and faculty members. Shifting pedagogies and changing instructional methods were critical during the pandemic for Health Science faculty. The evolution of mannequins and the significance of simulation in Health Science laboratories is an alternative to a small portion of clinical hours, but not enough to replace closed clinical facilities. Remote instructional delivery and transition to virtual clinical and simulations were relied on heavily.
during the pandemic as a last resort to continue education. The global pandemic required curriculum adaptations, exam procedures, and accommodations for students to endure the challenges of a pandemic. The COVID-19 global pandemic imposed negative impacts on students, and education post-pandemic will be altered forever. Chapter II closes with a discussion of the theoretical framework. Chapter III discusses the chosen methodology of the study. Chapter IV presents the findings of the investigation. To conclude, Chapter V gives the conclusions of the inquiry.
CHAPTER III

METHODOLOGY

The purpose of this qualitative study was to explore Health Science faculty’s innovation of practice and pedagogy during a transition to remote learning amid a pandemic. This chapter will review the research questions; discuss the research approach, setting, and selection of participants. Additionally, chapter three will explain the role of the researcher, limitations and delimitations, data collection, and triangulation. A discussion of procedures, data analysis, and ethical considerations will conclude the chapter.

Research Questions

To attain the aim of this study, the researcher explored the following research questions:

RQ 1. How do Health Science faculty describe challenges emerging from the transition to online delivery of curriculum?

RQ 2. What pedagogical strategies do Health Science faculty use to transition from face-to-face to online instruction?

RQ 3. How has the transition to online instruction changed Health Science faculty approach to adapting instruction in laboratory and clinical settings?
Qualitative Approach

The researcher chose a qualitative perspective for the study. A qualitative research study provided rich interpretation of narrative data, which, in this case, derived from individuals sharing experiences regarding the phenomenon under study (Crossman, 2020). Qualitative research is beneficial in Health Science as it guides difficult problems encountered, specifically regarding quality improvement and best practice (Pope and Mays, 2013). Qualitative research occurs in the environment where the phenomenon takes place. Creswell and Creswell (2018) mention the benefits of observing participants interacting in a naturalistic setting as the major distinctive aspect of qualitative research. Direct interaction with participants is a hallmark of qualitative research, as the inquirer is positioned in the natural setting, along with participants, where the phenomenon occurs (Creswell and Poth 2016).

The researcher explored Health Science faculty’s transition to remote learning during a pandemic. As such, a phenomenological design is most appropriate to address the research problem (Creswell, 2018). Phenomenological research designs, which are not prescriptive, describe the lived experiences of participants with the phenomenon (Creswell, 2018). The researcher intends to explore the participants’ experiences individually and collectively around the area of inquiry (Moustakas, 1994). As the instrument of inquiry, the researcher collected, analyzed, and interpreted narrative and textural data to uncover emerging themes that assist with addressing research questions.
Research Setting

The Institution of study, located in southeast Minnesota, was founded in 1858 and has a campus size of 125 acres (City of study, 2020). The city of the institution has a population of nearly 27,000, the 39th largest city in Minnesota (City of study, 2020). The median age of residents in the city is 37.8 years (City of study, 2020). The city’s estimated median household income is $140,000 (City of study, 2020). Proximity to the next biggest city is 40 miles (City of study, 2020). As the largest provider of higher education in the Minnesota State Colleges and Universities (now Minnesota State) system, the institution is accredited by the Minnesota Department of Health, Minnesota Board of Nursing, and the Accreditation Commission for Education in Nursing (ACEN), and the Higher Learning Commission. The institution enrolled 7,596 students in 2019 through traditional, hybrid, and online delivery systems (Institution of Study, 2020a). Figure 1 below illustrates the gender distribution of enrolled students at the Institution of Study. Figure 2 demonstrates the racial and ethnic demographics of the college. Finally, Figure 3 denotes the distribution between full-time and part-time students.

Figure 4

Distribution of Gender
Figure 5

**Distribution of Race and Ethnicity at the Institution of Study**

![Race/Ethnicity Distribution](image)

**Race and Ethnicity**
- Caucasian: 83
- Hispanic/Latino: 3.7
- Black/African American: 3
- Asian/Pacific Islander: 2
- Two or more races: 0.1
- American Indian/Alaskan: 0.3
- Non resident Alien: 4
- Unreported: 4

Figure 6

**Full and Part-Time Enrollment Status**

![Enrollment Status](image)
The Health Science department includes Nursing Assistant/Home Health Aide (NA/HHA), Trained Medication Aide (TMA), Practical Nursing (PN), Registered Nurse (RN), Medical Assistant (MA), Phlebotomy, and Radiography. The department’s mission is to develop students’ communication skills, intellect, and the ability to interact with diverse populations (Institution of Study, 2020); thus, the curriculum focuses on fundamentals of safe patient care, verbal and written communication skills, and basic human needs (Institution of Study, 2020).

Selection and Recruitment of Participants

Purposeful Sampling

For this study, the researcher used purposeful sampling to select participants. The Purposeful sampling technique is common with qualitative research studies, as it enables the selection of participants knowledgeable and experienced with the phenomenon (Palinkas et al., 2015). Exploring the phenomenon of Health Science faculty navigating remote learning during the pandemic requires participants to work directly in the field to create a more in-depth understanding of the situation. The researcher determined the sampling method most appropriate for the study and selected participants that would provide rich and thick details to promote a robust investigation (Luborsky & Rubinstein, 2011). Participants had experience transitioning from in-person to online instruction, which will allow them to provide rich and thick descriptions of their experiences (Lani, 2020).

Snowball Sampling

For this study, the researcher will also include snowball sampling to enhance the diversity of participants to obtain robust and rich findings. Kirchherr and Charles (2018) assert snowball
sampling is common in Health Science qualitative studies. Patton (2016) posits the process gains momentum as each interviewee provides a referral to broaden the participant pool eventually producing enough participants for the study. Patton (2016) posits seeking referrals for participants with in-depth knowledge of the phenomenon enables information-rich cases. The participant pool continually enlarges as the researcher seeks suggestions for additional participants to enhance the study (Merriam, 2009). An identified disadvantage of utilizing snowball sampling includes the potential for bias in selection (Etikan and Bala, 2017). When there is no other way to reach the desired sample population snowball sampling works well for the study (Sharma, 2017). Accessing hidden populations critical for research studies is possible when employing snowball sampling (Noy, 2008). Snowball sampling also provides information regarding characteristics about unintended individual populations not expected to be discovered (Noy, 2008).

Creswell (2018) argues phenomenological study sample sizes are small, ranging from three to 10 individuals. Smaller sample populations are manageable for the researcher to collect and analyze narrative and textural data, contributing to a study that may return results with quality of depth (Creswell, 2018). Ten participants from the Health Science Department are eligible for selection to participate in the research study, as they are currently instructing in the Associate Degree Nursing, Licensed Practical Nursing, and Nursing Assistant Home Health Aide programs, and have been actively teaching during the rapid transition to online learning in response to the COVID-19 pandemic. The researcher deemed three faculty members ineligible for the proposed study because they teach in Radiography and Medical Assistant programs, which were not affected by the pandemic. Courses were already offered online for theory, and clinical requirements concluded before the nationwide shutdown. Participants are employed at
the same institution as the researcher, and rapport is established among all individuals.

Recruitment consisted of sending an invitation to participate in the research study via email, which explained the voluntary nature of participation. The email invitation also informed recipients that no retaliation will occur if individuals opt-out of the study at any point. (See Appendix). Table 4, below, illustrates the demographic description of the participants.

**Table 1**

*Description of Participants*

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>Years in the Profession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>Female</td>
<td>Native American</td>
<td>7</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Female</td>
<td>Caucasian</td>
<td>7</td>
</tr>
<tr>
<td>Participant 3</td>
<td>Female</td>
<td>Caucasian</td>
<td>9</td>
</tr>
<tr>
<td>Participant 4</td>
<td>Female</td>
<td>Caucasian</td>
<td>53</td>
</tr>
<tr>
<td>Participant 5</td>
<td>Female</td>
<td>Caucasian</td>
<td>15</td>
</tr>
<tr>
<td>Participant 6</td>
<td>Female</td>
<td>African American</td>
<td>4</td>
</tr>
<tr>
<td>Participant 7</td>
<td>Male</td>
<td>Caucasian</td>
<td>2</td>
</tr>
</tbody>
</table>

**Role of the Researcher**

Lincoln and Guba (1985) identify the researcher as the main instrument of data collection, analysis, and interpretation in qualitative research studies. A benefit of having a human being serve as the main instrument includes the capability to react to non-verbal and indirect cues during the data collection process (Pezella et al., 2012). Pezella et al. (2012) additionally argue
that removing unintentional bias, opinions, and expectations that may support or oppose the participants is crucial. Clark and Veale (2018) posit qualitative researchers discuss rationales, supported by extant literature, for choosing the area of inquiry for a research study. Integrity is crucial to the researcher striving for excellence and accuracy throughout all stages of the research study, and the primary inquirer for this study will incorporate all elements recommended to achieve trustworthiness in the proposed study (Yin, 2011).

**Limitations and Delimitations**

Limitations are elements outside of the researcher’s control. They can decrease validity, but disclosing such variables assists in making the study reliable (Smith, 2020). The following limitations pertain to the study:

1. Willingness of participants to provide truthful responses to interview, focus groups or questionnaires.
2. Willingness of participants to share teaching experiences.
3. Availability of participants to attend scheduled interview and focus group sessions.

Delimitations are factors within the researcher’s control that represent the constraints of the study (Simon, 2011). The following delimitations pertain to the proposed study:

1. The researcher has chosen to conduct the study at a public community college in southeast Minnesota.
2. The researcher has chosen to include only Health Science faculty whose courses were transitioned to online delivery.
Data Collection

Phenomenological research explores participants’ lived experiences and ways in which they make meaning of those experiences. To that end, this researcher employed individual interviews, focus groups, and questionnaires as data collection methods (Patton, 2016).

Collecting data in the natural setting from individuals experiencing the phenomenon contributes to a deeper understanding of perceptions shared (Creswell and Creswell, 2018). After the data has been collected, the researcher assigns themes and codes to make meaning from the findings. This study used open-ended questions because they do not require standardized responses and enable the researcher to gain an understanding of points of view without predetermining answers from previously devised questions (Patton, 2016). Patton (2016) posited open-ended questions permit the researcher to recognize the standpoint of the phenomenon through the participant’s view. Eliminating preconceived perceptions, the researcher employs open-ended questions to gather data from the participant’s point of view.

Lochmiller and Lester (2015) explained the significance of beginning with two broad, open-ended questions and several follow-up questions for seeking clarification. This study comprised individual interviews, focus groups using open-ended questions and online questionnaires. Phenomenological research included conducting interviews and questions, providing directions that facilitate the researcher to obtain in-depth dialogue and authentic opportunities (Creswell, 2018). Heuristic inquiry creates a robust study as the researcher must demonstrate a passionate concern, and participants must be extremely knowledgeable about the phenomenon (Patton, 2016). Heuristic inquiry provides a rigorous study from conversations and interviews intentionally chosen for the study of inquiry (Patton, 2016). Participant’s perception provides the researcher with mutual understandings of the phenomenon, contributing a connection with
participants working towards a common goal of deeper understanding (Patton, 2016). Creswell (2018) argued that qualitative designs enable participants and the researcher to interact in their natural environment for observation and involvements to contribute in a flexible manner resulting in copious descriptions.

**Triangulation**

Triangulation of data entails inspecting evidence from multiple sources to rationalize themes that increase the validity of a study (Flick and Steinke, 2004). Multiple data collection methods help determine emergent themes and credibility in the analysis phase of the study (Patton, 2016). Combining evidence from different data collection sets to identify and justify emerging themes strengthens the research study findings (Creswell, 2018). For this study, triangulation of data collection provided the researcher with multiple points from which to analyze narrative data and produce emerging themes regarding faculty’s transition to remote learning implementation of pedagogical practices during the pandemic. Qualitative researchers use triangulation to comprehend the phenomenon thoroughly (Patton, 2016). The convergence of multiple data strategies from numerous sources enables the researcher to test the validity of the study (Carter et al., 2014). Patton (2016) identifies four types of triangulation of data: method triangulation, investigator triangulation, theory triangulation, and data source triangulation. Method triangulation is most commonly used in qualitative research studies and involves assembling various data collection methods around the same phenomenon (Carter et al., 2014). Examples of method triangulation include observations, field notes, and interviews of participants in the study. This study employed methods of triangulation in data collection to include focus groups, interviews, and questionnaires.
Interviews

Semi-structured individual interviews were conducted using a web-based platform. Online interviews are appropriate because of restrictions put in place because of the global pandemic. Interview protocol consisted of open-ended questions, which permitted the participants to provide extended responses (Patton, 2016). The researcher used participant responses during the interview to gain insight into the participants’ lived experience with the phenomenon (Weller et al., 2018). The researcher recorded all interviews, listen to, and transcribed the participant’s replies. The researcher also took notes during the interview process, making a record of the participant’s pauses in dialogue for reference during data analysis. Extreme caution to record the participant’s responses accurately was employed (Creswell, 2018).

Focus Groups

The second data collection method for triangulation was focus groups. Focus groups enhanced the study because participants experiencing the same phenomenon will be together in an engaging setting (Barbour, 2018). Momentum from participant interaction may contribute to a context for robust dialogue. Focus groups interview protocol consisted of objective and open-ended questions. The researcher recorded the focus group session and took notes during the meeting. The recording will be transcribed by the researcher and double-checked for accuracy.

Creswell (2013) posits focus groups enable the researcher to ask open-ended questions in a semi-structured environment. Crossman (2020) asserts that focus groups are beneficial for small groups, 5-15, to generate data to examine situations occurring within a specific community of people. Small sample sizes create an atmosphere conducive to robust dialogue with the ability to maintain sufficient momentum responding to others’ shared insight. This data collection method promotes robust dialogue, empowering participants to cue from others’ feedback, and prompting
memory of personal experiences that contribute to the conversation (Creswell, 2018). Assisting with the momentum of the dialogue and expanding on others’ input to the conversation is an asset. Patton (2016) argues that focus groups allow the researcher to gather information unobtainable in individual interviews. The utility of focus groups becomes central to illuminating participant perspectives on experiences with a common phenomenon.

**Questionnaires**

Questionnaires are research instruments used to obtain information from participants to collect large amounts of data within groups with the ability to measure preferences, opinions, and attitudes (McLeod, 2018). Questionnaires were created on Survey Monkey, and a link was sent electronically to participants to answer questions pertaining to their experiences with transitioning from face-to-face instruction to online delivery. Text boxes allowed the respondents to add detail as deemed appropriate for open-ended questions.

**Trustworthiness**

Lincoln and Guba (1985) assert that research studies, qualitative studies specifically, must be trustworthy to ensure validity. Trustworthiness is obtained by establishing credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985). Trustworthiness is achieved when the researcher converges multiple data sources or individual perceptions to express study findings (Creswell, 2018). Yin (2011) posits research studies must be transparent, permitting others to inspect the data and evidence to support the findings and conclusions from the study. Reliability specifies that the methodology is dependable, with varying researchers and assignments (Creswell, 2018).
Credibility

Credibility is accomplished in research by member checking, which verifies the data, interpretations, and ensures findings are represented correctly (Johnson, 2020). Creswell and Creswell (2018) define member checking as a dialogue between the researcher and informant to confirm the connotation and veracity of collected data. Member checking also enables the participant to expand further to achieve accuracy for answers given during interviews.

Threats to internal validity point to the researcher’s capability to verify outcomes not being attributed to unintentional factors (Creswell and Creswell, 2018). Internal validity threats present from members within the study, preventing the researcher from adequately assessing the data about participants (Creswell and Creswell, 2018). Bernadette and Morrison (2018) identify ten threats to internal validity that researchers must remain aware of to lessen flaws in the study. History poses a threat, potentially exposing participants and the researcher to unintended occurrences that alter the findings (Bernadette and Morrison, 2018). The maturation of participants throughout the research study change perceptions and stances, thus manipulating the findings (Creswell and Creswell, 2018). Mitigating potential threats in credibility entail the triangulation of quality data and analysis of findings (Patton, 2002).

Data collection methods from interviews, focus groups, and questionnaires triangulated and member checked will further enhance credibility. Finally, qualitative inquiry and defending purposeful sampling and recognizing the study’s limitations will support the credibility of the study (Patton, 2016).

Transferability

Transferability is achieved in qualitative research by a detailed and thick description of the phenomenon, and so readers can determine individually if the study is transferable
(Lincoln and Guba, 1985). Purposeful sampling contributes to the transferability understanding of the lived experiences of the study. Transferability permits individuals to apply the findings of a study to external contexts where generalizability prohibits this action. The generalizability of a study conducted on a smaller scale does not represent larger populations of settings at various locales. Research studies occur within a specific time frame, and generalization is not permissible before or after the study limits (Creswell and Creswell, 2018). Lincoln and Guba (1985) assert a thick, rich description of the phenomenon that assists the researcher to achieve external validity.

**Dependability**

Dependability is critical to assure future researchers will achieve similar findings if the research is repeated, confirming a thorough study was conducted produced by another researcher conducting an external audit (Johnson, 2020). Reliability requires researchers to make conclusions regarding study designs and the effectiveness of the methods chosen, including the veracity of the findings (Nobel and Smith, 2020). Dependability is achieved by conducting external audits or inquiry audit from a neutral party not directly involved with the data collection or analysis to examine and confirm data supports the findings. (Johnson et al., 2020). Outside researchers, viewing data analysis and interpretation from a different lens confirms dependability, which is essential for trustworthiness.

**Confirmability**

Confirmability is achieved by analyzing the methodology and triangulation of data (Mandal, 2018). Employing multiple data collection methods strengthens the research study. Careful documentation by researchers and rechecking information guarantees confirmability
within the study. Carefully ensuring the data are outcomes from the participants and not the researcher aids with eliminating bias in the study (Pandey and Patnaik, 2014).

**Data Analysis**

The researcher examined data obtained from the collection process and found meaning from the narrative data. Creswell (2018) asserts that data analysis is a concurrent process, and the researcher examines findings as they present, while actively conducting additional research. Copious amounts of data from qualitative studies require the researcher to examine carefully and categorize findings into five to seven emerging themes (Creswell, 2018). Caution is necessary to eliminate unintentional bias in the research interpretation or findings (Creswell, 2018). Moustakas (1994) argues that suppositions by the researcher must be avoided and must solely focus on the phenomenon and on outcomes that will initiate further research. Once data has been obtained, the researcher must then make meaning by assigning codes.

Creswell (2018) emphasizes data from all collection methods first require organization and a thorough examination to organize and categorize responses in order to discover emergent themes. The process that allows sense making of the textural data is coding. Yin (2011) describes coding as allocating labels or codes to particular words, phrases, or pieces of information to gain a deeper understanding of concepts. Generally, coding data entails grouping responses and classifying with a title representative of participant’s verbiage (Creswell, 2018). More specifically, the researcher will begin the process with open coding, which entails assigning labels to concepts and devising appropriate categories based upon the data collected (Khandkar, 2020). Open coding prevents forcing unrelated data into categories and removing confusion (Glasser, 2016). Moghaddam (2016) asserts that open coding illuminates many categories of the
main phenomena guiding the study. The researcher anticipated codes fall into three categories, 1. Expected codes, 2. Surprising codes, and 3. Codes of unusual interest (Creswell, 2018). Codes were assigned to participants to protect their identities. Transcribed data was coded to determine categories.

Transcripts from the interview, focus group, and questionnaire data required complex classification to assign meaning (Patton, 2016). To that end, the primary inquirer utilized axial coding after categories of data were determined. The researcher used axial coding to construct deeper meaning from the open codes, and to discover emerging themes from data obtained from the participants (Allen, 2017). The researcher used a system of color-coding for ease of reference.

**Procedures**

Procedures for this research study adhered to the following steps:

1. Conducted an oral defense of the dissertation proposal to the chair and committee members in October 2020.

2. Requested and received approval from the Institutional Review Board to conduct the study: The study involved human subjects and cannot be conducted without formal approval.

3. Requested access to participants for individual interviews, focus groups, and the distribution of questionnaires.

4. Provided participants with formal request letters via professional email addresses marked with high importance and read receipts attached. Informed consent letters and protocol forms for individual interviews, focus groups, and questionnaire procedures were
dispersed via email. Included in the email, participants had a timeline of the interviews, focus groups, and questionnaires with dates to conduct the study. Advance notification enabled faculty to clear schedules to remain available for the study.

5. Conducted individual interviews, focus group sessions, and distributed questionnaires to participants. Zoom platform for focus groups provided safety during the pandemic lasting 90 minutes. Individual interviews via Zoom lasted one hour per participant and were scheduled based upon participant’s availability. Questionnaires were open for one week for participants to complete and submit via Survey Monkey.

**Ethical Considerations**

Creswell (2018) argues that respecting the code of ethics throughout every stage of the research process and upholding emphasizes veracity. Protecting the participants’ identity, anonymity and ensuring personal data remains confidential and secure is the researcher’s ethical responsibility (Creswell, 2018). The study adhered to guidelines established by the Institutional Review Board (IRB) and were respect the human subjects of the study. All parties were above the age of eighteen and were able to consent to participate. Participants were informed of the research study’s potential risks, which are minimal to none. Participants were aware of the option to withdraw at any point without penalty. Information about data that will be obtained and utilized was shared with all participants in the study. The researcher has no conflict of interest or prejudices regarding the study that was conducted. Yin (2011) argues that researchers must have strong ethical standards to avoid bias and establish guidelines to minimize ethical challenges. The process of identifying preconceived expectations, cultural factors, personal interest in the study that might alter the data collected is termed as bracketing (Newman and Tufford (2012)).
Bracketing was utilized to mitigate researcher bias that could potentially taint the findings (Tufford, & Newman, 2012).

The researcher communicated with officials from the institution of study, including Director of the Doctor of Education Program and faculty committee members. For security purposes, the removal of names during transcription were replaced with non-identifying codes when reporting the data. The researcher caused no harm to participants nor displayed unethical behavior to any parties involved in the study. Data collected was disseminated truthfully to convey accuracy for a robust research study. Documentation from individual interviews, focus groups, and questionnaires remain locked in a cabinet at the researcher’s home, only sharing the contents with the committee members and chair. Upon completion of the study and final defense, documents will remain locked and will be shredded after five years have passed.

**Summary**

Chapter three discussed the methodology for the research study. The qualitative phenomenological approach employed explores Health Science faculty navigating the transition to remote learning during the current pandemic identifying best practices. The chapter provided rationales for choosing a qualitative design and a phenomenological approach for the study. A detailed description of the setting and participants was provided in chapter three. Additionally, sampling methods were discussed in this section, as well. Chapter four will discuss the study’s results and findings. Chapter five will provide a detailed discussion of the findings, implications, and recommendations for future research.
CHAPTER IV

FINDINGS

Introduction

The purpose of this qualitative study was to explore lived experiences of Health Science Education faculty navigating changes amid a global pandemic and reconstructing programs with the online modality. Chapter I focused on Health Science Education during a global pandemic and altering instructional methodologies globally, nationally, statewide, and locally. Chapter II presented a historical context of the evolution of Health Science Education followed by changes imposed by the global COVID-19 and adaptations to instructional methods. Chapter III addressed the research design and rationale for using qualitative methodology. Chapter IV restates the problem statement, research design research questions, reviews participant requirements, provides descriptions of participants, discusses data collection and analysis, presents findings, and summarizes the chapter.

Restatement of the Problem

Little is known about the educational preparation of Health Science professionals and faculty perceptions of practice and pedagogy while transitioning to remote learning during a global pandemic (Morgan, 2020). Schools endured mass shutdowns globally while pivoting from face-to-face instruction to distant learning (Drane et al., 2020). Research suggests that Health Science programs converted theory online with little disturbance, but laboratory and clinical components demanded innovation and strategic planning to obtain program outcomes (Sood, 2020). A gap in the literature exists identifying best practices for faculty in clinical settings promoting teamwork, communication, and real-life applications preparing individuals for the workforce (Bvumbwe
Accreditation bodies governing the Health Science curriculum mandated strict adherence to policies at programs at the college level. Faculty leading Health Science programs were required to incorporate theory, laboratory, and clinical components to ensure students’ competencies before program completion. The global pandemic shuttered doors to clinical partners impeding the Health Science faculty's ability to meet the required hours of face-to-face direct patient care essential for degree completion (Hilburgh et al. 2020). College administration closed campuses as directed by Government and Health officials eliminating the opportunity to complete mandated hours for the laboratory components outlined in the curriculum (Daniel, 2020). Health Science faculty faced two significant dilemmas resulting from the global pandemic. The first was changing instructional delivery, formerly requiring face-to-face instruction and observation to assess learning competency to a distance-learning environment (Hilburg et al. 2020). The second concern was navigating learning to meet the mandated laboratory and clinical hours with establishments closed to non-essential personnel (Dewart et al., 2020). In periods of crisis, the most significant error leaders make fearing the consequences of wrong decisions and negatively affecting individuals. Leaders often remain paralyzed by fear in efforts to advance learning (Netolicky, 2020). Rapid changes minimize deliberation time but demand effective communication in practice (Netolicky, 2020).

**Review of Research Design**

This study was conducted using a qualitative phenomenological approach. The study’s design was appropriate to explore the lived experiences of Health Science Faculty who transitioned from face-to-face instruction to remote delivery during the global COVID-19 pandemic. Purposeful selection of participants and snowball sampling ensured diversity in
ethnicity and area of specialty were represented and careful consideration enabled the researcher to choose individuals specific for the study.

Seven Health Science faculty participated in the study. Although several individuals were invited to contribute to the study, most failed to respond to the invitation letter and follow-up request. All participants were Health Science faculty teaching during the global COVID-19 pandemic and transitioned from face-to-face to online learning. The researcher collected data that provided answers to the following research questions.

RQ 1: How do Health Science faculty describe challenges emerging from the transition to online delivery of curriculum?

RQ 2: What pedagogical strategies do Health Science faculty use to transition from face-to-face to online instruction?

RQ 3: How has the transition to online instruction changed the Health Science faculty approach to adapting instruction in laboratory and clinical settings?

**Participant Recruitment**

To guide with recruitment, the Chairperson and Director of Nursing at the Institution of Study provided a link to faculty currently employed in Health Science disciplines and working throughout the pandemic. Credentials and specialty areas were available for the researcher to determine whom to invite to participate in the study. Diversity was lacking in ethnicity and specialty area; hence, snowball sampling was employed to elicit a more diverse selection of participants. The researcher constructed a list of participants was constructed to target faculty across various Health Science Programs to obtain data from several departments. Creswell and Poth (2016) argue that qualitative research studies should include three to ten participants.
Candidates received an email from the researcher, which included the invitation to participate (See appendix A). If no response was received within a week, the researcher sent a follow up to request participation. When faculty responded willing to participate, each received an informed consent letter, which when was signed and returned was filed under lock and key. Upon receipt of the signed consent form, the data collection process began.

**Participant Descriptions**

Participant 1 is a Native American female in the mid-40s instructing in the Radiography department. The participant is an alumnus of the institution of current employment and has worked there for seven years. The participant holds a master's degree and is currently contemplating a doctorate, exemplifying a passion for education. The faculty member received a promotion recently and assumed the director's role in the department. The program is flourishing under the new direction, as the new leader is building rapport with community members, clinical partners, and prioritizing networking. Participant 1 strives for an environment conducive to learning to enhance success. Participant 1 enjoys spending time with family, exploring nature, and traveling. Gardening is a passion and provides an opportunity to reflect on life. The participant’s hobbies encompass attending Christian concerts and seminars. Faith is of utmost importance to the participant, especially having grown up with parents who are missionaries, and grandparents who were ministers. Having a solid foundation in faith has enabled the participant to endure trials and tribulations posed by the pandemic and trust that outcomes will be optimal. Extending grace and compassion to students and leading by example are the basis of the personal philosophy of participant one. Giving back to the institution that provided the opportunity to obtain an education is a motivating factor, as well as continually enhancing education passed on to students.
Participant 2 is a Caucasian female in the mid-60s and employed with the Health Science department for seven years. Initially teaching solely in the Nursing Assistant Home Health Aide Program, Participant 2 recently began instructing the Trained Medication Aide course. Retirement after this semester awaits for participant 2, a decision made during the pandemic. Personal challenges with technology have been the deciding factor as obstacles are too significant to overcome. Participant 2 has an associate degree in nursing and will work as a paraprofessional in the local school after retirement. Participant 2 is married and never had children, and spends time traveling, frequenting unique restaurants, and going to thrift shops. Twenty-mile daily bike rides, walks in the park, and remaining physically active remain top priorities. High-strung is this participant. As standard practice, the average day begins around 2:00 AM, which is when the participant arrives on campus to prepare for teaching at 4 AM. Anticipation for retirement offers excitement to spend quality time with family members and flexibility to travel more extensively with no time constraints. Although excited about the prospect of retirement, participant 2 will miss the student interaction and feels blessed to have positively molded countless medical professionals. Compassion extended through the years and relationships established provide fond memories of the years of instruction.

Participant 3 is a faculty member teaching in the nursing department for the past nine years. This study subject is a Caucasian female in the mid-30s. Currently holding a master's degree in nursing, participant 3 is currently applying to colleges to obtain a terminal degree. To remain current on direct patient care skills, participant 3 works at a local hospital in a casual role filling in for others as needed with no set schedule providing another exciting and challenging nursing dimension. Life-long learning is evidenced by volunteering to attend conferences and webinars to enhance practice continually. When not working, Participant 3 enjoys spending time with
family, including a spouse and a new baby. Passions include boating, fishing, reading, and attending musical productions.

Participant 4 is a veteran instructor in the nursing department. Serving in the current role for 53 years, the participant is the mid-70s, female, and Caucasian. Teaching nursing is fulfilling and rewarding, and at this stage of life does not feel like working. Before the interview began, the faculty member stated, "I will never retire; they will have to force me out of here because this job is my passion and fulfilling." The life-long career guiding countless students into the nursing profession, but also the ability to precept future nurse educators is equally rewarding. Participant 4 published nursing books, devised study guides, and learning exercises for nursing students to enhance learning. Collaboration and teamwork are essential for participant 4. When time permits, participant 4 enjoys taking cruises, traveling with family members, relaxing on the beach, and taking boat rides.

Participant 5 is a mid-40’s Caucasian, vibrant, highly motivated nursing instructor specializing in the simulation lab, and has served in the profession for fifteen years. Holding a master’s in nursing and pursuing a Doctorate degree, remaining engaged in learning and current evidence-based practice is a priority. Although currently overwhelmed with instructing during the pandemic and meeting the doctoral program requirements, participant 5 enjoys spending time with family members. Areas of interest include movies, dinners out, and spending time outdoors enjoying nature. Before the pandemic, travel and weekend get-a-ways were enjoyed however, now the time is consumed with remaining home, working on studies, and planning for the simulation lab.

Participant 6 is an energized nursing instructor, always seeking creativity in the classroom with instruction. Unique instructional methods encompass games, music, and laughter in the
classroom. It is common having the instructor enter the classroom singing, dancing, or dressed up in intriguing costumes to remove tension and enhance learning. Serving in the role for four years, the participant desires an atmosphere conducive to active learning and engagement, jeopardized by the current pandemic. The participant is in the early ’40s, African American, holds a master’s degree in Nursing, and is currently pursuing a doctorate. Married with two children, the participant’s hobbies entail watching musicals, singing, and spending time with family members. A unique attribute for this participant is the stellar leadership displayed and compassion for colleagues’ success.

Participant 7 is a male instructor for a Radiography program. The male in his late 40’s holds a bachelor’s degree with two years of experience in the profession, recently transitioning from direct patient care roles. Novice to the educator role, and still trying to aclimate to academia, participant 7 struggles finding adequate balance between professional obligations and home life with a wife and two children. Hobbies include hunting, woodworking, and watching movies to alleviate stress. Wit and humor were evidenced throughout the dialogue and a true sense of passion for student success radiated when speaking to this participant. Half of the academic career thus far transpired during a global pandemic, which has provided additional challenges from stressors from adapting to a new role in general. Embracing the continual changes and learning through each experience have provided experience to guide future upheavals in the educational setting. The philosophy of continually growing through trial and error is exemplified from the global pandemic. Student success is the ultimate goal, regardless of challenging life situations.
Table 2

*Participant Demographics*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Ethnicity</th>
<th>Gender</th>
<th>Years of Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Native American</td>
<td>Female</td>
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</tr>
<tr>
<td>P2</td>
<td>Caucasian</td>
<td>Female</td>
<td>7</td>
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<tr>
<td>P3</td>
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</tr>
<tr>
<td>P4</td>
<td>Caucasian</td>
<td>Female</td>
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</tr>
<tr>
<td>P5</td>
<td>Caucasian</td>
<td>Female</td>
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<tr>
<td>P6</td>
<td>African American</td>
<td>Female</td>
<td>4</td>
</tr>
<tr>
<td>P7</td>
<td>Caucasian</td>
<td>Male</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data Collection**

In qualitative research, the researcher serves as the primary instrument, collecting data from interviews, focus groups, and questionnaires, does not rely on others to devise the collection materials (Creswell and Creswell, 2018. Triangulation of data from multiple collection methods helps the researcher comprehend and understand the phenomenon (Patton, 1999). The researcher must identify bias to strengthen data interpretation (Creswell and Creswell, 2018). Bracketing, known as "epoche," requires the researcher to put aside bias, personal experiences, previous research findings, and knowledge of experiences to solely examine participants' responses (McNarry et al., 2019). The Bracketing mitigates preconceptions the researcher has, that could potentially flaw the findings enabling focus to remain on the participant's share of lived experiences (Tufford and Newman, 2012).
Online Questionnaire Data

The online questionnaire (Appendix C) comprised of individual interview and demographic questions. The initial questions centered on age, gender, ethnicity, years served in the profession, and specialty area. The next questions focused on the pandemic instructional adaptations and practice changes essential to meet accreditation body guidelines. The researcher typed the document and participants' responses to review and begin identifying common themes among participants.

The researcher avoided bias from reflexivity by self-evaluation and remaining aware of potential aspects that contribute towards tainting the findings and results. The researcher engaged in dialogue with fellow researchers to discuss known and potential biases and personal experiences related to the study. The researcher jotted memos in a journal through all stages from data collection by way of analysis stages, noting aspects of biases presenting. Lastly, the researcher identified biases in the research study so that readers can make individual inferences from the results.

Individual Interview Data

Health Science faculty completed individual interview questions (Appendix D). The initial five questions inquired about age, gender, ethnicity, area of specialty, and years spent in the profession. The next four questions queried about transitioning from face-to-face learning to online with a lack of resources and how the assessment of students' competency transpired. Individual interviews were conducted via Zoom to comply with national and state officials requesting social distancing. Zoom video recording for individual interviews transpired, and participants logged on with the video camera off, and names listed as "participant" and the assigned number to protect anonymity. The extra precaution as necessary since Zoom owns
rights to videos, but disclosure was in the informed consent letter. The researcher listened to the recordings and transcribed the dialogue onto a word document. Bracketing assisted the researcher in setting aside personal bias and preconceptions, focused solely on the participants' experiences.

**Focus Groups**

Health Science faculty participated in the focus group (Appendix E) to share lived experiences. The initial five questions inquired about age, gender, ethnicity, area of specialty, and years spent in the profession. The following five questions centered on successful approaches teaching face-to-face and how transitioning to the online modality altered instruction and learning approaches. Time constraints with faculty during the pandemic prevented more participants from contributing to the study. Zoom was the safest method to conduct the focus group with social distancing guidelines and fear of contagion. The focus group was conducted on Zoom and recorded with the participant's permission. Participants attended from home with cameras off and a code name to enhance anonymity. Zoom discloses permission to retain video recordings, and additional measures implemented ensured the participant's optimal safety regarding identity.

To avoid identified and potential biases, the researcher instituted reflexivity by evaluating personal beliefs regarding the data aimed to collect to remove preconceived notions and influences of findings and results shared by participants. Bracketing permits the researcher to examine the respondent's answers thoroughly and identify essential significances. Removing bias, preconceptions, previous research findings, and personal experiences enabled the researcher to be receptive to experiences shared and accurately describe findings in the research study. Self-
evaluation through reflexivity also assisted with removing biases that may potentially taint the research findings.

**Analysis of Qualitative Data**

Analyzing qualitative data occurs with five general steps. The first process requires the researcher to transcribe the data and print transcripts from the collection methods and accompanying notes or supporting items essential to strengthen the study’s findings (Creswell and Creswell, 2018). Organizing the data according to the sources of collection assists with the analysis process. The second step in qualitative data analysis entails reading through all transcripts to apply meaning from participants’ feedback (Creswell and Creswell, 2018). The researcher included a review of field notes and began to apply meaning to data obtained. Step three of data analysis is the researcher’s process of coding data and assigning words to signify identified categories (Creswell and Creswell, 2018). In step four, themes are devised using the coding process, and ideally, the researcher establishes five to seven emerging themes for the research study (Crewsell and Creswell, 2018). Step five of data analysis requires the researcher to distinguish how to best represent the narrative from participants to deliver the outcomes of the analysis (Creswell and Creswell, 2018).

The researcher gathered rich and thick descriptions of the Health Science faculty's experience and triangulated online questionnaires, individual interviews, and focus groups on distinguishing emergent themes identified in the study. Analyzing data with open and axial coding assisted with notifying the emergent themes from three data collection methods.

**Selective coding**
Coding

The researcher prepared data for analysis encompassed a five-step process. Step one required the researcher to determine what questions to ask with the individual interviews, focus groups, and online questionnaires. Step two entailed determining what and how to measure the data obtained after collection (Dillard, 2020). Next, the researcher collected the data from the seven participants in the study. The next step was to analyze the data obtained. Reading through the data completely the first time enabled the researcher to identify frequently mentioned concepts or ideas. In the second read-through the researcher began highlighting similar feedback and making notes in the margins to identify similarities.

Open coding

The researcher used open coding to categorize and identify concepts from the raw data. Condensing large quantities of data into smaller groups is achieved with open coding. Open coding provides meaning to the researcher by categorizing and assigning codes to participants' direct narrative (Liu, 2020). Open coding of the raw data guided the researcher to take textual data, breaking into discrete parts.

Open coding was the researcher's initial process with the raw data obtained from interviews, focus groups, and online questionnaires to identify general concepts, groupings, and headings (Creswell, 2013). The researchers read the data seeking common ideas mentioned from all participants. Assigning a color per specific concept identified enabled ease of reference to triangulate the data. Color-coding enables the researcher to compare and identify patterns to
investigate further. Assigning codes to the words and phrases participants shared in the narrative assist with deciphering, analyzing and summarizing the results of data collection.

Color-coding was beneficial for the researcher during open coding to categorize related aspects from the interview, focus group questions, and online questionnaire results. Visuals with different colors empowered the researcher to identify similar concepts throughout the coding process quickly. The researcher assigned "chunks" of text and assigned codes to the information to guide distinguishing commonalities. *In vivo*, is actual verbiage from participants helped portray the lived experiences (Creswell & Poth, 2016). Results of the open coding process encompassed yellow: tactile/traditional/resources, green: technology, teal: communication/collaboration/engagement, pink: student mastery/assessing learning

**Axial coding**

Axial coding employed next ensured participants' responses were accurately depicted and identify the concepts (Patton, 2016). Axial coding constructs linkages between the data gathered, revealing codes with the voices of the participants (Patton, 2016). Axial coding assisted with exploring relationships between themes and individual responses of participants. Axial coding of qualitative data makes connections from open codes to create more extensive codes or themes. Relating the data to reveal codes and categories for the researcher transpires with axial coding. Reading codes from open coding and assigning them into groups guided the researcher in establishing emergent themes from constructing linkages between the data.

Axial coding reinforces the categories that reflect the interview, focus groups, and online questionnaire responses. Axial coding also guides the researcher in identifying correlations of the perceptions and classifications of narrative responses from participants (Patton, 2016). Axial
coding provided the opportunity for the researcher to recognize classifications to identify emergent themes (Creswell and Creswell, 2018). Butt (2020) posits that axial coding benefits allow the researcher to reassemble data from open coding, and new connections amongst the categories are determined. Lastly, selective coding discerns one central category that connects all codes from data analysis and captures the essence of the research study.

**Trustworthiness**

Trustworthiness is desired in qualitative inquiry through data collection and interpretations, employing transparency and integrity from the researcher (Lincoln and Guba, 1985). Quantitative studies seeking trustworthiness entail internal/external validity, reliability, and objectivity (Pitman, 2016). In pursuit of a trustworthy qualitative study, Lincoln & Guba (1985) argue four criteria should be considered: credibility, transferability, dependability, and confirmability. Credibility entails ensuring the study is examined what the researcher intended (Shenton, 2013). Lincoln and Guba (1985) posit credibility is the most crucial aspect of establishing trustworthiness. Transferability the study's ability to be applied to other situations and a broader population, contributes to trustworthiness (Shenton, 2013). Credibility is achieved by two techniques including triangulation and member checking. Transferability is attractive if individuals believe the findings apply to positions held (Shenton, 2013). Transferability is achieved by providing rich descriptions and evidence the study’s findings are applicable in other settings and contexts. Dependability centers around other researchers conducting similar studies with the same data collection methods and participants similar findings would present (Lincoln & Guba, 1985). Dependability is achieved by asking an outside researcher to conduct an inquiry audit on the research study to verify components. Confirmability ensures the findings are the participants' results and not that desired by the researcher (Shenton, 2013). Confirmability is
achieved by thoroughly document the procedures employed for checking the data throughout the research study and asking an outsider to challenge aspects of outcomes, carefully documenting all stages. Lincoln & Guba (1985) argue that data triangulation using multiple sources strengthens the credibility of the research study.

Four themes emerged from the analysis of data comprised of focus groups, individual interviews, and individual online questionnaires. Direct quotes from participants support the emerging themes. A summary of emergent themes appears in table 6 below.

**Table 3**

*Themes Derived from Focus Group, Individual Interview, and Online Questionnaires*

<table>
<thead>
<tr>
<th>Emergent Theme</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Lack of Pedagogy Capacity to Deliver Remote Instruction</td>
</tr>
<tr>
<td>2</td>
<td>Shift from Didactic to Conceptual Contextual Learning</td>
</tr>
<tr>
<td>3</td>
<td>Shift in Assessment of Skills and Competency</td>
</tr>
<tr>
<td>4</td>
<td>Faculty Creativity in Changing the State of Practice through Course Redesign</td>
</tr>
</tbody>
</table>
Emergent Theme 1: Lack of Pedagogy Capacity to Deliver Remote Instruction

Education during the global pandemic and transition to virtual learning was critical and the Department of Education flexibility removing barriers for educators to employ virtual learning (Butcher, 2020). The first emerging theme provided insight to how Health Science educators responded to the global COVID 19 pandemic’s demand to lead instruction via a virtual landscape. Data supporting the first emerging theme was evidenced from the focus group conducted with three participants. Questions 6, 7, 8, 9 and 10.

Question 6 asked participants the following: What teaching approach for face-to-face teaching?

Question 7 asked: What adjustments were necessary to effectively convey content with the online modality?

P3: Using Zoom was the only option… surviving the new landscape and navigating our remote learning environment was necessary with not being able to be on campus or clinical.

P4: Prerecorded lectures and uploaded so students could view on their own time. I did not understand the technology well and guiding students with concerns was difficult in addition, .not being adept with technology was difficult. Finding programs to proctor exams from home was necessary. Technology was paramount for success but provided extra work to implement. Students struggled with technology barriers, bandwidth, and obtaining devices to continue learning. I was not prepared to lead students through technology issues, but I did my best to provide support. Transferring to the online learning model and conveying content was challenging because we lost critical learning time as we attempted to move content online and
figure out how to employ the resources and applications Zoom had to offer….overwhelmed trying to understand Zoom.

P6: Learning online was not ideal…..utilize the chat function since 43 students cannot talk and have a conversation due to how the program works. Zoom was great because we could have a synchronous course and see all the other students.

Question 8: How did the pandemic alter instruction of skills taught face-to-face requiring return demonstration?

P3: Using demonstration videos and talking through the steps was the best option.

P4: We needed to take full advantage of technology resources to provide the best opportunity to replace the hands on learning currently removed from our resources.

P6: We met over Zoom for the class. We realized students would learn better with the online modality since the in person stipulation impeded learning too much and students were not focused on the skills at hand. Planning for the next year we have implemented the online clinical and virtual Sims since we anticipate the pandemic will not be over.

Question 9: What alternative learning approaches were adopted during the pandemic in Health Science programs?

P3: We used virtual simulation and online clinical for students to be exposed to tasks and prioritization they would have performed if provided the opportunity to be onsite at the long-term care center or acute hospital settings. We used virtual simulations and laboratories for students to be exposed to tasks and prioritization they would have performed if provided the opportunity to be on-site at the long-term care center or acute hospital settings.
P4: Virtual simulations virtual clinical were adopted to help with the direct patient care experiences. I also relied on prerecorded skills videos for instruction and the use of PowerPoints and resources from the instructional resources from the textbook company that enabled student engagement online. The online landscape was subject to distractions and mitigating that aspect to enhance student learning was important.

Question 10: How helpful is your teaching experience in redesigning courses and lessons for the online modality?

P3: Understanding this risk I increased measures to promote test integrity including using test proctoring companies for when students took online exams….I knew I must protect test integrity, and I adopted an online exam proctor for my program…….Even with years of teaching experience there were challenges moving content online……Proficient with technology available was the biggest obstacle.

P4: rapid transformation of lessons moving online….there was no way to instruct students online that was fast with no access to the supplies we used in the laboratory and clinical setting.

Emergent theme one is further supported by the online questionnaire narrative obtained from four participants. Questions 6, 7, 8, 9, 10 & 11 yield data supporting flexibility responding to virtual instruction.

Question 6 queried: Describe your most significant challenge instructing during the pandemic and how did you contend with the encounter?

P1: Forced to the online platform…..little time to prepare adequately for online clinical and laboratory components. No backup plan moving this learning to an online modality. Online learning was difficult…..Autonomy and creativity with instructional methods online enabled
faculty to individualize lessons and still meet the high expectations from leadership personnel. Thankfully, the option for practicing skills online and teaching remotely was available from Minnesota Department of Health.

P2: Technology and transitioning to the online modality proved most challenging for me….Prerecorded instructional videos for students to see the proper way of performing skills was critical because working remotely there were no supplies available for practice and evaluation.

P5: Lack of adequate technology and resources off campus further complicated learning during the global pandemic. Students did not all have adequate technology and resources off campus which further complicated learning during the global pandemic. The Minnesota Board of Nursing permitted faculty and students to use online learning, which enabled learning to continue.

Question 7 asked: How did you meet accreditation body mandates for face-to-face instruction?

P2: Minnesota Department of Health granted permission to use online skill videos in place of direct patient care in a facility.

P5: Online clinical and virtual simulations met the mandates for hands on learning. Minnesota Department of Health and the Minnesota Board of Nursing permitted virtual simulations, online clinical rotations removing the mandate for face-to-face learning. Permitting virtual simulations, online clinical rotations, and removing the mandate of face-to-face learning was reexamined.
P7: Pedagogical approach changed to virtual learning here recording demonstration was the only option. We had to be flexible and as the pandemic continued, it was evident for governing bodies to extend alternatives to the direct patient care mandates handed down.

Question 8: How have you redesigned lessons to accommodate online instruction?

P1: We had to be creative within our department with the online learning. Change to virtual. Virtual learning and avatars replaced acute and long-term care clinical opportunities with direct patient care. Skill videos from publishing companies replaced face-to-face instruction and return skill demonstration. Zoom platform was relied on heavily. Using Zoom to instruct the hands on components and X ray was difficult but using breakout rooms with small groups assisted with accommodations online. Transferring procedure labs online the best way possible biggest adaption. Transition to full online learning.

P5: Relying on Zoom to connect with students during the instruction was essential. Pedagogy certainly changed by relying on virtual learning and having students rely on watching prerecorded skill videos and having students in turn return demonstration.

P7: The most significant change was virtual learning. Lessons online were difficult. Tutorial videos replaced in lab training demonstrating skills. Virtual clinical and simulations replaced face-to-face learning experiences with patients and direct supervision from preceptors. Individual online learning assignments were the norm for instruction of skills and clinical reasoning and clinical judgment.

Question 9 stated: Have you changed grading practice or curricular content during the pandemic? If so, please exchange the changes.
P5: The most significant change with the curriculum and grading is relying on virtual simulation and online clinical learning during the pandemic. Since faculty were overextended with the rapid mandate to move all learning, online rigor was removed from our programs.

P7: Teaching skills online was difficult for all parties involved…We relied on virtual learning and replaced that with face-to-face opportunities. With virtual lab and clinical portion was the pass/fail option and we did pass each student.

P1: Faculty and students are not accustomed to the online platform that we rely on now so the teamwork has proven beneficial while teaching online during the pandemic. Zoom was beneficial to instruct students, especially the breakout rooms. Moving forward students will be well prepared from online activities to apply when meeting face-to-face optimizing instructional time.

P2: Breakout rooms in Zoom enabled teamwork and individual assessment of student skills. The forced remote learning really made us realize how much we needed strong teamwork to navigate the transition.

P5: Zoom for instruction, online clinical and virtual simulations were most significant. However, with that came the concerns and fears of technology students and faculty encountered.

Question 11: Discuss areas of curriculum that have been modified to accommodate the transition to remote instruction?

P1: Lab transitioning online….Resorting to online lab experiences when no in person learning was the only option. Online lab experiences for students was critical when transitioning to remote learning. Modifying the laboratory component was the biggest struggle. Transitioning
to online via Zoom teaching skills was a challenge with the modified platform. There was no need to adjust any of the curricula though.

P2: We implemented online clinical experiences for students. We had to use the Zoom platform for instruction and evaluation. Modifications for curriculum entailed teaching laboratory components online via Zoom when stay at home orders were implemented. Modifications included having students record demonstrating skills at home.

P5: Remote learning required providing new learning experiences for hands on skills. Online lessons by Zoom, online clinical and virtual simulation to replace no clinical sites or laboratory available for hands on skills. We relied on online clinical and virtual simulations with the removal of face-to-face learning for extended periods of time. Moving theory online is not a challenge; however, the hands on component was very difficult. Modification entailed using Zoom to provide lessons for clinical and simulation experiences. Relying on rerecorded videos demonstrating skills was the most significant modification in the program.

P7: Transitioning to remote instruction required modifications in the lab and clinical setting. Relying on instructor resources with online clinical and simulated experiences was the best option available.

Question 12: Describe how the global pandemic affected planning for future semesters with uncertainty.

P1: The pandemic forced learning to transpire online. Adapting to the online clinical and simulation environment was difficult but it enabled time to enhance resources implemented for future semesters and learn from our emergency transition to the online modality.
Individual interviews obtained by four participants shared experiences that support the first emerging theme to strengthen the data obtained from focus groups and questionnaires. Four participants contributed to individual interviews that provide narrative of personal insight to virtual instructional delivery during the pandemic and flexibility required.

Interview questions 1, 2, 3, & 4 contributed to emergent theme 1.

Question 1: What resources did you use transitioning from face-to-face learning to online?

P1: Resources utilized included Zoom for a platform to see students and engage in dialogue. I relied on Zoom for instructional time. Moving to the online environment entailed relying on technology creating an environment conducive to learning, and reducing additional stressors. Breakout rooms were beneficial for employing cooperative learning. Online learning proved challenging to gauge students’ attention and comprehension level.....Turning lessons more interactive with technology was the only option available to teach students. I also relied heavily on prerecorded videos. Virtual clinical and simulations were paramount to continue learning online. Question # 1: What resources did you use transitioning from face to face learning to online?

P2: Zoom was the most essential resource depended on during the global pandemic. Technology removed the human element from learning. Instructional videos from Minnesota Department of Health to teach skills was one of the most valuable resources. YouTube was an excellent resource helping me learn technology. I needed YouTube to help me learn Microsoft Word and be able to send documents to students.
P5: We relied heavily on virtual simulations and online clinical for students learning since the campus was closed and clinical agencies were shuttered. Virtual clinical and simulations were the most significant resource transitioning to the online modality….Zoom was another resource that was essential transitioning to online from face to face learning. Zoom provided a platform for learning and connectedness.

P7: I relied on technology resources during the pandemic. Online clinical and simulations and interactive activities to enhance learning. Pedagogical changes to online instruction were challenging for faculty and students alike, but critical. Transitioning from face to face to online with Zoom was an invaluable resource.

Question 2: What resources were you lacking transitioning from face-to-face to online and accommodations required?

P1: My technology skills had to be beefed up and I did not have a laptop to use with remote learning. I reside in the country and my internet was not good so unfortunately when conducting Zoom courses I had to find an alternative place to teach. Students did the same so it was a widespread issue….Remote learning removed us from the lab and clinical setting but to further complicate things, we had no medical supplies. Accommodations necessary included using virtual simulations and clinical and the use of supplemental instructional resources. Going online made us change teaching strategies and focus on technology options to replace the hands on learning approach.

P2: Changing instructional approaches online required implementing new strategies providing learning without the human element. Using online clinical and simulation experiences and household items assisted with the resources lacking for online education.
Question 3: What techniques did you employ to instruct skills requiring hands-on learning?

P1: I used videos and resources provided by the ASRT…I relied on online videos….Using the Zoom platform was difficult instructing skills, but we made it work. I had to be flexible and adapt to the learning environment and ask students to do the same so learning could transpire to come capacity.

P3: Re relied on prerecorded skills videos.

P5: Teaching students remotely to auscultate a heartbeat, lung fields, or palpate body parts takes adapting when not in the lab or clinical environment….online videos demonstrating proper hand placement, normal and abnormal cardiac rhythms and gastrointestinal quadrants. The virtual simulation and online clinical provided the best experience possible for students though. Zoom was the only option.

Question 4: How did you assess student competency with remote learning and describe challenges posed.

P7: I struggled with assessing student competency online but knew I had to be creative and guide my students. Loss of ability to directly observe students taking exams was a difficult resource to lose. Of course, remote learning removed the resources we had on campus for training so we had to make adjustments. I asked students to log on Zoom and practice in breakout rooms. Creativity was paramount online without direct patient care.

Summary of emergent theme # 1

Pivoting to virtual learning was essential during the pandemic to continue education; in spite of struggles endured by faculty and students throughout the journey. Persistence with
available technology options for continued learning was paramount with Health Science faculty. This theme is supported in the research of Wiederhold (2020) who argues the pandemic increased Zoom users from 10 million to 300 million by 2020 and presented mechanical and network issues coupled with fatigue and anxiety from the new phenomenon. Lowenthal et al. (2020) posit asynchronous Zoom sessions amid the global pandemic enabled continued dialogue and a sense of community amongst educators and students.

Emergent Theme 2: Shift from Didactic to Conceptual Contextual Learning

The global pandemic thrust Health Science faculty into new learning environments to instruct students learning concepts in the new context. Historically founded on face-to-face learning and direct patient care experiences, reexamining how to meet learning outcomes called for creativity with the technology component. Conceptual contextual learning requires students to process new knowledge in a logical manner in various educational settings. Historically the environment would entail the classroom with the didactic approach where teachers would be the center of attention in the classroom, lab, or clinical providing information through lectures. The new learning environment assumes a student-focused approach with the virtual setting mastering concepts in the new context. Contextualizing learning based upon concepts and activities to best meet learning outcomes through effective teaching processes was critical during the pandemic (Forneris et al., 2020). Contextualized learning connects academic concepts to apply to a real-world context in Health Science education (Forneris et al, 2020). Emergent theme two derived from triangulation of data from focus groups, individual interviews and online questionnaires. Theme two was evidenced from the focus group conducted with three participants. Questions 6, 7, 8, 9 and 10 of the focus group support emergent theme two.

Interview # 6: What teaching approaches did you find successful with teaching face-to-face?
P3: Communication skills, teamwork, and collaboration. I placed students into small groups to work on projects. Group projects kept students engaged in the learning as they enjoyed the collaboration. Virtual learning and breakout sessions with students in small groups provided the ability to assess students meeting learning outcomes and team based learning in teams.

P4: Lectures and having students request additional guidance as needed. Immediate feedback for students to correct necessary steps. Learning online provides the opportunity for experiences like this from the chat button or interacting virtually online via Zoom. It provided the opportunity for students to partner and learn from one another, too. Transitioning to online learning afforded students the same benefits utilizing breakout rooms for group work and assessment of skills to ensure learning was transpiring. Transitioning to the student-centered approach online worked well for students.

Question # 7: What adjustments were necessary to effectively convey content with the online modality?

P4: Breakout rooms were the only option to engage students in teamwork and activities typically performed on campus. Students were able to engage in dialogue and gain confidence with understanding concepts being learned.

P6: Breakout rooms as much as possible online via Zoom. Interaction is limited the group they are assigned to when others in the class may not have thought about it all the same way to assist with mastering content.

Question # 8: How did the pandemic alter instruction of skills taught face-to-face requiring return demonstration?
P3: There was no face-to-face interaction. Adapting critical skills for our program learned through technology resources, Zoom, instructional videos etc. were the new norm at least for the immediate future. Students were able to learn concepts traditionally taught in person with technology advancements. Watching the recorded skills presented materials formally taught face-to-face.

P6: Breakout room were used to practice skills to learn the content necessary for passing the course and the national exams. Breakout rooms enabled individual assessments to ensure students were understanding the material and advancing academically. Within breakout rooms students were groups of three to enable one to read the steps of the skill, one to perform the skill and one to make notes for areas of improvement. The instructor facilitated learning by direct observation using the skills checklist to provide guidance on components lacking to ensure passing the certification exam. Having all students actively engaged in the small group provided a platform for active learning from all students to focus on skills each assuming a different role in the learning. The instructor was able to provide immediate feedback and asking students to stop when steps were missed and to repeat the proper way for mastery of the skill set.

Question # 9: What alternative learning approaches were adopted during the pandemic in Health Science programs?

P3: Assuming a mentor role to facilitate interactions was necessary employing the online modality….Removing the teacher center approach was adopted. Active learning opportunities were provided in forms of student sharing reflections, pieces of writing, and critical thinking to lead instruction and conduct assessments…..Breaking the students into two teams. Providing replacement of face-to-face experiences.
P6: Group activities in breakout rooms and digital tools to engage students in active learning.....sense of community. Flipping the classroom and serving, as a mentor was the new approach necessary for continued education of students.

Question # 10: How helpful is your teaching experiences in redesigning courses and lessons for the online modality?

P3: Group activities were possible by assigning breakout rooms for students to complete what formally would have been done in the classroom. Assessments were conducted in breakout rooms for skills performance. Small groups also were useful for continued student engagement a critical component of our programs for student success.

Online Questionnaire data obtained further supports the second emerging theme discovered in the study. Four participants in the study completed the online questionnaires contributing to new knowledge transitioning from the traditional pedagogy to the technology mode of delivery.

Question # 6: Describe your most significant challenge instructing during the pandemic and how did you contend with the encounter?

Question # 7: How did you meet accreditation body mandates for face-to-face instruction?

P2: Conducted the sixteen clinical hours in the laboratory when the campus opened up to smaller groups. Students would have case studies and use mannequins and peers to perform the skills and assignments formally completed in the long-term care facility.

P7: Supplemental activities became mandated during this period to meet course objectives and learning outcomes removed from the direct patient care experiences. Pedagogical approach
changed to virtual learning where recording demonstration was the only option. Formative to summative assessment was critical.

Question # 8: How have you redesigned lessons to accommodate online instruction?

P1: Flipping the classroom and making use of the waived mandates from accreditation bodies is paramount…breakout rooms enable instruction to continue to a lesser capacity….small groups on campus.

P2: The approach we had to initiate with the online learning was using Zoom for instruction. Using PowerPoints and sharing the screen was important during the pandemic for theory. Replacing on campus study groups, practicing with peers, and relying on our supplemental resources to provide experiences students were lacking from halted face-to-face learning. Removing the lab skills competency mandate and assigned projects ATI for learning opportunities for independent learning.

P5: Redesigning lessons entailed using Zoom and breakout rooms. Relying on Zoom to connect with students during the instruction was essential. Flipping the classroom, assigning breakout rooms for group work was used to optimize time together. Pedagogy certainly changed by relying on virtual learning and having students rely on watching prerecorded skill videos. The focus went from psychomotor evaluation to cognitive/affective evaluation.

P7: We were accustomed to face-to-face learning, so the most significant change was virtual learning. Alternative learning approaches not previously utilized. Relied on Zoom and did more group learning….The situated learning pedagogy was embraced before the pandemic, now remote learning technology pedagogy is the focal point. Changing the mindset shifting to remote
setting was critical moving forward with the online instruction. Individual online learning assignments were the norm for instruction of skills and clinical reasoning and clinical judgment.

Question # 10: Describe what resources were most significant teaching during the pandemic? Please explain how you benefited from them.

P1: Devising meaningful activities to engage student learning and guidance to effectively instruct online was critical.

P2: Assistance from colleagues transitioning to online was the most important. Breakout rooms in Zoom enabled teamwork and individual assessment of student skills.

Four participants completed individual interviews that provided insight to support findings from focus groups and the online questionnaire. Triangulation of data from all three collection methods provide robust feedback and understanding contributing to the study’s second emerging theme.

Question #1: What resources did you use transitioning from face-to-face learning to online?

P1: Breakout rooms were beneficial for employing cooperative learning. I wanted to promote socialization that might be lacking from no in person learning experiences. PowerPoints and using the time on Zoom together to provide guidance for students. I created Kahoot games, Jeopardy games to assist with students remaining actively engaged. Turning lessons more interactive with technology was the only option available to teach students. Prerecorded skill videos, online assignments, PowerPoints and using time on Zoom.
P2: Changing instructional approaches was important to incorporate inquiry based learning. Before the pandemic, I used the teacher centered-approach but I flipped the classroom for a learner-centered approach on Zoom.

P5: Breakout rooms were the only option for assigning group projects. Zoom provided a platform for connectedness which was crucial during the pandemic.

P7: To promote teamwork and interaction I would place students in breakout rooms to complete activities. Pedagogical changes to online instruction were challenging for faculty and students alike, but critical. Transitioning from face to face to online with Zoom was an invaluable resource.

Question # 3: What techniques did you employ to instruct skills requiring hands-on learning?

P1: I relied on online videos and students returning demonstration with items from their household. I asked students to use oranges to practice IM injections and hot dogs for subcutaneous injections. Positioning clients for diagnostic testing is also an important element of our program. I would have students use family members, baby dolls, or whatever was accessible to demonstrate competency.

P2: To instruct the hands on skills we used make shift labs at home. For example, the trained medication aide course would have empty pill bottles and candy to simulate medications.

P5: What served the students best during the pandemic was online videos demonstrating proper hand placement, normal and abnormal cardiac rhythm, lung fields and gastrointestinal quadrants.

Question # 4: How did you assess student competency with remote learning and describe challenges posed.
P1: I loved exams online and used a proctoring service. Students would use props from cardboard to simulate X-ray machines and print copies of X-rays from the internet.

P2: I asked students to grab a baby doll, teddy bear, or a family member to practice skills on for realistic approach. Students would log on to Zoom, perform the skills, which encompassed 82 in total. Students use tissue boxes to perform perineal care since it was readily available and simulated the female anatomy. Students would blow up medical gloves from their tote bags to perform foot care since it simulated a human foot. Students would use extension cords to perform catheter care. We really have to be flexible to the new learning landscape. Students would take their exams online now.

P7: I asked students to log on Zoom and practice in breakout rooms. Creativity was paramount, as students had to rely on family members or something they chose to replace a mannequin.

**Summary for emergent theme two**

Interaction among students in breakout rooms promoted teamwork and active learning environments for students. Assuming a student-centered approach advanced learning by having students engage in teamwork in breakout rooms. Shifting the focus from the faculty to the students promoted autonomy and shifted the responsibility of learning in the hands of the students. Zoom technology and the changed landscape during the pandemic promoted student engagement requiring teams to all participate in learning activities. The interaction among students with faculty observing provided the ability to conduct frequent assessments on students’ comprehension level and mastery of skills. A benefit for small groups in breakout sessions was the opportunity for teachers to pair strong students with weak ones to permit additional guidance. Teamwork in groups introduced students to new partners from their normal cliques which provides the opportunity to view concepts from a different lens. The removal of hands-on
components in Health Science programs and remote learning required creativity from faculty for continued learning. Ultimately, the flipped classroom approach, once deemed impossible for Health Science programs, proved successful.

Emergent Theme 3: Shift in Assessment of Skills and Competency

Design methods to assess hands-on skills in Health Science programs online encompassed completion of virtual clinical and simulation experiences and return demonstration with supplies at home. Changing pedagogy requiring students to create makeshift labs at home and utilize readily available products was critical to provide the opportunity for faculty to assess learning of hands-on skills. Faculty were forced to recreate lesson plans from face-to-face learning in the lab or at clinical with virtual opportunities. Educators employed thoughtfulness when designing instruction to enable learning outcomes to be obtained for student mastery of content, (McGaghie et al., 2020). Wang (2021) asserts the global pandemic mandated educators to transition online without preparation and are still navigating the task to optimize learning. The third emerging theme formulated from data provided from focus groups, online questionnaire and individual interviews sharing lived experiences navigating learning amid a global pandemic to prepare skilled students for the workforce.

Four participants provided firsthand experiences instructing during the global pandemic by completing individual interviews encompassing four questions. The four participants strengthened the third emergent theme providing additional narrative from Health Science faculty.

Questions # 4: How did you assess student competency with remote learning and describe challenges posed.
P1: Assessing skill competency online was very difficult. More so applicable to the hands on portion though. Assessing competency on theory content was not difficult as I just moved exams online and used proctoring service….The initial challenge was not having access to the equipment for demonstration and practice to learn skills. Students would use household items and then be assessed on skill competency….we want students to be successful. I did whatever was necessary to help them achieve success refusing to let the pandemic impede learning. I extended leniency and graded easier than I normally would because it was very difficult observing without access to the adaptation of instruction.

P2: Assessing competency via Zoom was difficult. It was critical to see the students through the program so they could meet the criteria and mandates necessary to pass the course. Assessing competency entailed having students demonstrate all 81 skills online. This took hours but we had to account for proficiency somehow for MDH. I would also have students demonstrate for the entire class and use the checklist to ensure each step was completed. Assessments online were difficult as we are designed for a face to face program and adaptations in the curriculum and assessments are not east to do. Students would take their exams online and I would review their individual exams. What proved challenging was not knowing if students were honest while testing though and the scores were reflecting student success.

P5: We assessed competency for theory and skills during the pandemic online. We had to do everything over Zoom, even assessing competency. Assessing skill competency took devotion to the instructor and student part. I asked students to record the skills needing to be evaluated and I would watch them to the best of my ability. We were more lenient with the evaluation of competency because we knew students were overwhelmed with the pandemic and fear of the contagion so we permitted students to be creative with items at home.
P7: I struggled with assessing competency online but I knew I had to be creative and guide my students. I had students’ complete exams online with software that locked down the computer to mitigate cheating. Loss of the ability to directly observe students taking exams was a difficult resource to lose. Assessing competency for hands on skills that was more difficult to navigate. I needed students to complete the program on time so I would stand by them whatever it took throughout the process. I would have students demonstrate online and document them meeting objectives and criteria for the accreditation bodies. All parties were committed to seeing students thought to completion of programs.

Question # 2: What resources were you lacking transitioning from face to face to line and accommodations required?

P2: Removing the human element from our program founded on direct patient care to learn skills, apply theory to providing care and establishing patient rapport and enhancing written and verbal communication through multidisciplinary teamwork was difficult. Changing instructional approaches online required implementing new strategies providing learning without the human element. Access to supplies that enhance learning will never be taken for granted.

Question # 3: What techniques did you employ to instruct skills requiring hands-on learning?

P1: The American Society of Radiology Technological provided a number of resources to replace the hands on component. We had students return demonstration and create group activities to best reinforce what was demonstrated to assess competency. Using the Zoom platform was difficult instructing skills, but we made it work and students met the objectives.
P2: Our program is based on skill competency, so this was an obstacle in deciding how to deliver instruction for skills without the hands-on learning environment. We relied on prerecorded skill videos and asking students to practice and record skills enabled the opportunity to provide feedback on improvements needed.

Focus group questions 6, 7, 8 & 9 share narrative from participants and their journey teaching in Health Science education during the global pandemic.

Question # 6: What teaching approaches did you find successful with teaching face-to-face?

P3: Evaluate competency and the students to understand the significance of knowing how to complete tasks… to duplicate in regards to demonstration and assessing competency. Students apply the learning from the classroom in the laboratory on mannequins, peers, and eventually in clinical rotations.

P6: Applying the knowledge to patients was the best teaching experience with the face-to-face model. I was able to assess the skills the ability to establish a rapport with others, prioritization skills, critical thinking skills, it was much more than memory and recall.

Question # 7: What adjustments were necessary to effectively convey content with the online modality?

P3: Demonstrate skills or assess student proficiency…..paying attention during lessons and assessing how much they were understanding was critical. Focusing on essential material students needed to be successful completion of the program.
Question # 8: How did the pandemic alter instruction of skills taught face-to-face requiring return demonstration?

P3: It was difficult assessing skills. Adapting critical skills for our program learned through technology resources, Zoom, instructional videos etc. were the new norm for the immediate future. Hoping students were learning, too. Innovation with assessing competency of psychomotor skills proved challenging and took a less important role to the critical thinking, clinical reasoning skills and the ability to demonstrate knowledge of the theory component.

P6: As a team, we are beginning to decide evaluation methods and how to rely on the virtual learning experiences for students matriculating through the program.

Question # 9: What alternative learning approaches were adopted during the pandemic in Health Science programs?

P3: Having students record skills, critiquing them, and revising. It was the best way to observe for growth and force students to apply themselves and continually practice. Providing an environment conducive to learning minimizing distractions was critical.

P4: Ongoing assessments namely low stake were to observe student learning and academic growth. The online landscape was subject to distractions and mitigating that aspect to enhance student learning was important.

P6: Continual assessment...serving as a mentor was the new approach necessary for continued education of students.
Online questionnaires completed by four participants provided additional support of the third emerging theme sharing insight of individual approaches initiated to ensure student proficiency. Questions 6, 7, 8, 9, 10 & 11.

Question # 6: Describe your most significant challenge instructing during the pandemic and how did you contend with the encounter?

P1: Evaluate learning and lead instruction….Having permission from governing bodies to minimize expectations of face-to-face clinical hour alleviated stress. Autonomy and creativity with instructional methods online enabled faculty to individualize lessons and still meet high expectations from leadership personnel.

P2: Evaluating competency was difficult with no access to the clinical settings or laboratory to ensure skilled students were entering the workforce. There were no supplies available for practice and evaluation. Teaching hands on skills historically learned in the lab or clinical online with no medical supplies took creativity and leniency regarding evaluation and removing rigor of assignments.

P7: Changing the lab and clinical experiences for students also required reevaluation of coursework, grading practices to promote learning and not penalizing students for situations beyond their control.

Question # 7: How did you meet accreditation body mandates for face-to-face instruction?

P1: The Joint Review committee on Education Radiologic Technology JRCERT has been extremely supportive with the unprecedented times permitting faculty to make autonomous decisions in the students’ best interest without constant approval from the board members. They
have allowed us to do what is best for our students without constant approval from them to assess competency. Moving learning online with virtual clinical and labs were the option. We did what we felt would serve students best to replace face to face learning.

P7: We had to assess students in some capacity. Respecting the accreditation body willingness to replace face-to-face learning was paramount. Programs would have halted students’ progression without variances and waivers. We had to be flexible and as the pandemic continues it was evident for governing bodies to extend alternatives to the direct patient care mandates handed down.

Question # 8: How have you redesigned lessons to accommodate online instruction?

P1: We had to be creative within our department with the online learning. The primary pedagogical approach was the change to virtual learning and the removal of direct patient care that our practice is founded on….we were able to adjust as needed and then eventually transition to full online learning to assess competency. Students recording skills at home and emailing faculty was the norm for assessing competency.

P2: Demonstrating skills over Zoom and having students practice while I observed performance was necessary. Replacing on campus study groups, practicing with peers and relying on our supplemental resources to provide experiences students were lacking from halted face-to-face learning. Redesigning lessons to provide experiences students were lacking from face to face learning. Thankfully this benefited students and programs otherwise we would have run out of healthcare workers.

P5: Having students demonstrate and return videos for the instructor to evaluate with no direct patient care. MDH was not prescriptive and faculty could use judgment to best meet students
learning needs. Simulation which may previously been a formative assessment now became summative. This is a major change in pedagogy, as faculty are not relying on something; they may not have had proper evaluation/assessment strategies. Redesigning lessons entailed using Zoom and breakout rooms. Flipping the classroom, assigning breakout rooms for group work was used to optimize time together. When establishments close, colleges, long-term care, and acute hospitals removed, the potential for students to learn skills on patients it was detrimental. Pedagogy certainly changes by relying on virtual learning. This is a major change in pedagogy was faculty were now relying on something they may not have had proper evaluation/assessment strategy for.

P7: It was challenging to assess student comprehension and skill proficiency, but we did our best. No access to learning supplies required faculty to remove competency and evaluation.

Question # 9: Have you changed grading practice or curricular content during the pandemic? If so, please explain the changes.

P1: With the AART not making any adoptions to the board content the lab and clinical competency evaluation methods were more lenient. It was important to continue instruction with the new landscape although not ideal, because our students were in high demand during the pandemic and we needed them to enter the professional workforce.

P5: Rigor was removed from our programs and student evaluation was encompassed in that aspect. Before the pandemic students would learn in the lab or clinical environment and would remediate until they were deemed proficient. Now we are relying on resources devised by publishing companies to instruct future healthcare workers essential skills….realizing the options needing embraced so students can complete program requirements and enter the workforce is
paramount. The Minnesota Board of Nursing sets academic standards for program success so students can pass the NCLEX exam on the first attempt. The faculty did not want to change grading practices or curricular content during the pandemic.

Question # 10: Describe what resources were most significant teaching during the pandemic? Please explain how you benefited from them.

P2: Breakout rooms in Zoom enables teamwork and individual assessment of student skills.

Question # 11: Discuss areas of curriculum that have been modified to accommodate the transition to remote instruction.

P2: We had to use the Zoom platform for instruction and evaluation. Removing the human element of direct patient care has never been done before, so relying on learning was quite a challenge to assess competency and effectively instruct. Modifications included having students record demonstrating skills at home and faculty-reviewing students’ performance to assess competency.

P5: Modification entailed using Zoom to provide lessons for clinical and simulation experiences. Relying on prerecorded videos demonstrating skills was the most significant modification in the program. In addition, navigating program outcomes and learning objectives and ensuring compliance with the online modality was challenging and not possible. Focus was on continued learning with options readily available and we just moved forward providing the best opportunity possible for students with altered landscapes.

P7: In essence, we focused on what the most important aspects would be and how to meet students’ needs. We removed the busy work so students could focus on critical components since they were overwhelmed with the stress of the pandemic. We just really tried our best to meet the
students’ needs academically and with consideration to the global pandemic and challenges posed.

Question 7 of the focus group queried: What adjustments were necessary to effectively convey content with the online modality?

To display transparency for the reader the researcher desired to display a negative response that did not in fact support the emergent theme.

P4: It was difficult assessing skills. Assessing return demonstration from students was difficult. I was not sure how much students were understanding of the skills. Assessing students’ proficiency online was very difficult.

**Summary of emergent theme 3**

Emergent theme three revealed creativity of grading methods is critical for continued learning and assessment of hands-on skills in Health Science fields. Faculty reexamined curriculum and focused on critical components to equip students with success on national examinations and entering the professional workforce. Although not easy to convert learning environments to the online modality, faculty and students embraced technology for continued learning. Removal of program mandates from accreditation bodies was a key component enabling programs to continue offering education to students. Ultimately, the goal seemed to prepare competent students for practice in spite of challenges presented from the pandemic.

Emergent Theme 4: Faculty Creativity in Changing the State of Practice through Course Redesign

Satisfaction and appreciation were demonstrated when faculty tenaciously employed instructional strategies with the online modality (Correles et al., 2020). The global COVID-19
pandemic forced educators to change instructional landscapes with little time to deliberate best practice. Challenges posed; however, promoting continued learning with alternative methods of instruction was appreciated.

The fourth emergent theme was devised from participants sharing lived experiences during focus groups, online questionnaires and individual interviews. Focus group questions 6, 7, 8, 9, & 10 provide the researcher to obtain data supporting emerging theme 4.

Question # 6: What teaching approaches did you find successful with teaching face-to-face?

P4: I found success in assigning papers, concept maps, and having students complete workbooks associated with the textbook. Completing assignments in Zoom and in breakout sessions enabled the ability for continued learning that previously transpired in the classroom.

P6: High fidelity mannequins in the simulation in the lab and taking students to long term care and acute care clinical were beneficial for face-to-face learning. Both aspects were replaced employing virtual simulation and virtual clinical opportunities. Virtual learning permitted students to remain on track for program completion with the removal of bedside nursing experiences.

Question # 7: What adjustments were necessary to effectively convey content with the online modality?

P6: Activities to really assist students learning the content…..but it is more difficult online. I have had to think of new activities that can be done via Zoom. …..lack of clinical sites accepting students. Clinical experiences have been the main course of curriculum modifications. We adopted virtual simulation and clinical opportunities for students. Although there were
challenges potentially to impede program completion, the virtual patients were beneficial for overcoming barriers from the pandemic with learning in the programs.

Question # 8: How did the pandemic alter instruction of skills taught face-to-face requiring return demonstration?

P3: When agencies opened up again drastic measures were instituted preventing adequate hands on learning. Lab and clinical instruction required additional protection. In person learning required PPE, gloves, medical masks, eye protection, and social distancing to ensure safety for students and faculty. Barriers presented were addressed so safe learning could continue and programs were not impeded.

P4: Removing the human component from the equation required redesigning the current program model. We removed the requirements for clinical/lab hours and points assigned for both. To replace that learning expectation we assigned virtual learning opportunities with avatars and used Zoom breakout rooms to demonstrate and practice skills critical for program completion and national testing.

Question # 9: What alternative learning approaches were adopted during the pandemic in Health Science programs?

P4: Virtual simulations and virtual clinical were adopted to help with the direct patient care experience. This helped with supplementing learning since clinical options were not available. Extending flexibility with teaching and learning was critical during the pandemic.

Question # 10: How helpful is your teaching experience in redesigning courses and lessons for the online modality?
P3: No amount of prior teaching experience prepares anyone for the transition to an altered landscape, especially lacking resources. However, resiliency was demonstrated to overcome challenges and redesigning program expectations. Halting programs were not an option, so as a department teamwork to devise meaningful learning opportunities was implemented.

P6: Using resources available was relied on heavily. We used resources students and faculty already were accustomed to, such as Zoom to conduct class. Although nothing replaced in person learning, the virtual clinical and simulations and instructor resources proved beneficial components for instruction.

Four participants completed online questionnaires that further supported the fourth emerging theme. Questions 6, 7, 8, 9, 10, 11 & 12 contribute narrative from participants sharing lived experiences.

Question # 6: Describe your most significant challenge instructing during the pandemic and how did you contend with the encounter?

P1: Forced to the online platform from previous face-to-face learning was difficult. Never before have face-to-face learning been halted. No site access was concerning. Having permission from the governing bodies to minimize expectations of face-to-face hours alleviated stress for faculty and students. That was the biggest obstacle to overcome. We adopted prerecorded skill videos from publishing companies and interactive assignments and group projects to best simulate direct patient care experiences prohibited during the pandemic.

P2: No access to the clinical setting or laboratory paramount for face-to-face learning for skills and evaluating competency was difficult. Challenges also entailed no access to learning equipment for practicing. It was definitely a struggle and different to navigate. Our college
provided devices for students and free internet access so there was no disparity observed. Students were also given money from CARES act to help with materials necessary learning from home.

P7: Rethinking learning experiences to replace lab and clinical opportunities for hands on learning was the biggest obstacle…deliberate new instruction approaches conducive to online learning meeting outcomes. Lack of resources for students, technology barriers halting attendance and meeting required participation hours. Overall, there were so many challenges and they continue to present. Virtual simulation and clinical opportunities assisted with replacing no direct care patient experience.

Question # 7: How did you meet accreditation body mandates for face-to-face instruction?

P1: We did what we felt would serve students best to replace face to face learning. Moving learning online with virtual clinical and labs were the option. Creating case studies applicable to real life settings also was a strategy for instruction.

P2: Conducted the sixteen clinical hours in the laboratory when the campus opened up to smaller groups. To overcome the government mandates we had students wear PPE gowns, gloves, medical grade masks, face shields and maintain 6 feet social distancing. This proved challenging, but enabled learning on campus to resume at limited capacity. We also had students’ complete skills on mannequin instead of on peers.

P5: Online clinical and virtual simulations meet the mandates for hands on learning. Minnesota Department of Health and the Minnesota Board of Nursing permitted virtual simulations, online clinical rotations removing the mandate of face-to-face learning. Permitting virtual simulations, online clinical rotations, and removing the mandate of face-to-face learning was reexamined.
P7: Supplemental activities became mandates during this period to meet the course objectives and learning outcomes removed from the direct patient care experience. Respecting the accreditation bodies’ willingness to replace face-to-face learning was paramount because programs would have been halted.

Question # 8: How have you redesigned lessons to accommodate online instruction?

P1: The removal of direct patient care that our practice is founded on. Removing simulation with mannequins and peer practice groups required Zoom breakout rooms and accessible items at home to replace the equipment and patients. Virtual learning, simulation and clinical were the biggest changes necessary for continue learning with mandates handed down from federal and local government. We were determined to keep our program running so students could enter the workforce.

P2: The approach we had to initiate with the online learning was using Zoom for instruction. Demonstrating skills over Zoom was necessary. We removed clinical rotation, lab simulation on campus and replaced it with virtual experiences. Replacing on campus study groups, practicing with peers, and relying on supplemental resources provided experiences students were lacking from halted face-to-face learning. This redesign was utterly different from the face-to-face method as no technology was incorporated in the program previously. We changed curricular content and focused on infection prevention, health promotion and pandemic responses. Removing the lab skills competency mandate and assigned projects ATI for learning opportunities for independent learning. Using our resources at hand were critical.

P7: We are accustomed to face-to-face learning so the most significant change was virtual learning. When we were granted permission to continue education without direct patient care it
enabled the use of alternative learning approaches not previously utilized. We rely on face to face instruction so moving online we had to take advantage of waivers from accreditation bodies or else learning would have stopped until face to face was permitted again.

Question # 9: Have you hanged grading practice or curricular content during the pandemic? If so, please explain the changes.

P1: Reducing the opportunity for hands on instruction required us to remove complex assignments and reducing the rigor and clinical/lab outcomes to provide the opportunity for students to complete the program on time.

P2: Changing curricular content during the pandemic did not transpire because it would have set students up for failure. For the clinical and laboratory aspects, our department did make adjustments. Because both establishments closed and we were forced to have, students complete the online learning to gain credit for this portion of the program.

P5: Now we are relying on resources devised by publishing companies to instruct future healthcare workers essential skills and communication techniques for working in the professional role so students can complete program requirements and enter the workforce.

P7: We relied on virtual learning and replaced that with the face-to-face opportunities. This never would have transpired outside of a global pandemic.

Question # 10: Describe what resources were most significant teaching during the pandemic. Please explain how you benefited from them.
P5: Zoom for instruction, online clinical and virtual simulations were most significant. Mandatory conversions to online learning removed time to deliberate the if component and we were forced to rely on one another to adapt to our new learning environment.

Question # 11: Discuss areas of curriculum that have been modified to accommodate the transition to remote instruction.

P2: There were no clinical sites available for training and learning because of the pandemic. In addition, the campus closing removes the option of laboratory practice for the skills of our program. We implemented online clinical experiences for our students. Clinical hours were conducted on site at the campus lab when face-to-face instruction resumed.

Question # 12: Describe how the global pandemic affected planning for future semesters with uncertainty.

P2: Sadly goggles, face shields, gloves, iso gowns truly impede learning. We are trying to enhance learning while respecting the CDC guidelines and those handed down from MDH too. We have a safety plan for the lab across the MN state college system. Smaller teams on campus together is required so that takes more times. Enhanced cleaning per campus removes instructional time. Revised course removing future clinical rotations and altered lab activities for small groups and minimal face-to-face interaction in compliance with the government agencies. It all tied back to the current rulings and lab safety protocols.

P5: Curricular change based on social distancing clinical availability is a major change to how we can meet outcomes. Plans moving forward entail full online, the hybrid format, so we are prepared to transition when necessary with minimal disruption in education.
Four participants engaged in individual interviews consisting of four questions. Insight from participants provide an additional layer of support for the study’s fourth emergent theme. Below direct narrative will be shared from the participants.

Question 1: What resources did you use transitioning from face to face learning to online?

P1: Online learning proved challenging …the transition from face to face to online; I incorporated group-learning activities. I created Kahoot games, Jeopardy games to assist with students remaining actively engaged. PowerPoints and using Zoom to provide guidance for students. Turning lessons more interactive with technology was the only option available to teach students….demonstrating the skills and techniques unable to be mastered online. Virtual clinical and simulations were paramount to continue learning online.

P5: We relied heavily on virtual simulation and online clinical for students learning since the campus was closed and clinical agencies were shuttered. With no access to mannequins and laboratory equipment to demonstrate or practice on, we had to use household items, and they were less than ideal. …Removing the human element with campus and clinical facilities closed enabled our programs to remain in session as students prepared for completion. Zoom was a resource essential for transitioning to online from face to face learning.

P7: I relied on technology resources during the pandemic. Online clinical and simulations and interactive activities to enhance learning. I had to change some lessons that were better for instruction during the pandemic online. To promote teamwork and interaction I would place students in breakout room to complete activities. Pedagogical changes to online instruction were challenging for faculty and students alike.
Question 2: What resources were you lacking transitioning from face to face to online and accommodations required?

P2: Removing the human element for our program founded on direct patient care to learn skills, apply theory to providing care and establishing patient rapport and enhancing written and verbal communication through multidisciplinary teamwork was difficult. Changing instructional approaches online required implementing new strategies providing learning without the human element….Resources such as medical supplies for demonstration and practicing skills were difficult managing without.

Question 3: What techniques did you employ to instruct skills requiring hands on learning?

P1: The American Society of Radiology Technological provided a number of resources to replace the hands on component. We utilized videos and had students return demonstration and create group activities. We utilized videos and they allowed us to access and work through scenarios. Using the Zoom platform was difficult instructing skills but we made it work and students met the objectives.

P2: Our program is based upon skill competency so this was an obstacle in deciding how to deliver instruction for skills without the hands on learning environment. To instruct the hands on skills we used make shift labs at home. For example, the trained medication aide course would have empty pill bottles and candy to simulate medications.

P5: Teaching students remotely to auscultate a heartbeat, lung fields, or palpate body parts takes adapting when not in the lab or clinical environment. What served the students best during the pandemic was online videos. Relying on virtual learning was the only option. Now we are permitted back on campus in limited capacities. However, social distancing, facemasks, shields,
gloves are required. Adapting to a continually changing environment and mandates for hands on learning in the lab and clinical setting have forced me to reevaluate what is most important for students to be successful in practice.

Question 4: How did you assess student competency with remote learning and describe challenges posed?

P7: I had to be resourceful so learning was not jeopardized or halted. Creativity was paramount as students had to use props at home to simulate medical equipment and rely on family members or something they chose to replace a mannequin….Waivers were granted thankfully permitting students to complete this portion online without the direct patient care. Never has this been granted before, so we knew all parties involved were committed to seeing students through to completion of programs.

Summary of Theme 4

Removing the human element in Health Science programs was essential in pivoting to the online modality. Lack of time to prepare, regardless of prior faculty experience, mandated swift action. Closure of campus and clinical partners required faculty to rely on virtual learning opportunities replacing direct patient care experience. When face-to-face learning resumed to smaller capacities, learning needed additional redesign to comply with Center for Disease Control guidelines.

Summary

Findings of the study developed from data obtained through focus groups, individual interviews, and online questionnaires. Follow-up questions were not asked throughout the course of the research study because educators were overextended from teaching during the pandemic.
and juggling additional responses throughout this period. Respecting time constraints of
participants, the data collection process was kept to a minimal to ensure individuals would agree
to participate in the study. Four emergent themes devised from the study: (a) Lack of Pedagogy
Capacity to Deliver Remote Instruction (b) Shift from Didactic to Conceptual Contextual
Learning, (c) Shift in Assessment of Skills and Competency Chapter four encompassed the
findings of the research study (d) Faculty Creativity in Changing the State of Practice through
Course Redesign. Chapter five comprises a discussion of the findings, conclusions, implications
for practice and recommendations for future research.
CHAPTER V

DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The purpose of this qualitative study was to explore lived experiences of Health Science Education faculty navigating changes amid a global pandemic and reconstructing programs with the online modality. The researcher aimed to discover how faculty achieved accreditation body mandates with remote learning. Halted clinical sites and closed campuses removed the direct patient care required for program completion. Chapter I focused on Health Science Education during a global pandemic and altering instructional methodologies globally, nationally, statewide, and locally. Chapter II presented a historical context of the evolution of Health Science Education followed by changes imposed by the global COVID-19 and adaptations to instructional methods. Chapter III addressed research design and rationale for using qualitative methodology. Chapter IV restated the problem statement, research questions, reviewed participant requirements, provided descriptions of participants, discussed data collection and analysis, presents findings, and summarizes the chapter. Chapter V identifies the study themes and conclusions related to each of the research questions, discusses implications, and offers recommendations for practice and future research.

Overview

The setting for this study was a university in Southeast Minnesota encompassed in the Minnesota State Colleges and Universities (now Minnesota State) system. Health Science educators converting face-to-face instruction online during the pandemic were invited to participate in the research. The participants shared the lived experiences of curriculum
adaptations, challenges, and pedagogical strategies employed with the altered educational landscape due to the global pandemic. Detailed and rich descriptions of personal experiences were obtained through individual interviews, online questionnaires, and focus groups. Triangulation of data from the three data collection strategies contributed to the credibility and trustworthiness of the study (Patton, 2016).

The seven participants consisted of female and female, displaying diversity including Caucasian, Native American and African American. Years of experience and employment ranged significantly among participants. The oldest participant was employed for 53 years, and the least was seven years. The emergent themes derived from the study encompassed: (a) Lack of Pedagogy Capacity to Deliver Remote Instruction (b) Shift from Didactic to Conceptual Contextual Learning, (c) Shift in Assessment of Skills and Competency Chapter four encompassed the findings of the research study (d) Faculty Creativity in Changing the State of Practice through Course Redesign. Chapter four contained the findings presented in the research study. Chapter five encompasses a dialogue of the findings, conclusions, implications for practice, and research recommendations.

**Theoretical Connections**

Three theories comprise the theoretical framework supporting the study. E-Learning theory, Theory of Reasoned Action and Transformative Theory. The application of E-Learning Theory in the study was relevant and enabled the researcher to deeper understand the significance of online courses' careful construction to enhance student performance and avoid overload from distractors. E-Learning Theory by Mayer (2003) centers on remote learning and faculty delivering robust lessons removing distractions so students can solely focus on content. Sweller (2005) argues mental exertion encompasses three aspects; germane, intrinsic, and extraneous.
Germane relates to remembering material (Sweller, 2005). Intrinsic is the complexity for students to recall the material and execution the assignment the instructor has requested (Low and Sweller, 2005). Extraneous cognitive load discusses how difficult the instructor makes the content to grasp based upon how the presentation (Sweller, 2005). E-Learning theory focuses on minimizing extraneous cognitive load and managing intrinsic loads at levels best suited for the learning (Mayer and Moreno, 2003). Reducing the mental effort required to complete the task and managing the intellectual exertion required to perform the task enhances learning (Sweller, 2005).

Faculty were forced to abruptly transition to online education and providing manageable loads of learning for students. With the onset of the pandemic, faculty reassessed what assignments and lessons were essential and what content could be eliminated to ensure students focused on the most critical material since thoughts were on the pandemic and not focused solely on academics. Participant 4 mentioned challenges teaching online and assessing if students were actively engaged or comprehending the material taught. Distributing fair workloads for students during the pandemic to avoid overburdening students was critical, and participant 4 mentioned struggles with the concept. Emergent theme one: Lack of Pedagogy Capacity to Deliver Remote Instruction and emergent theme three: Shift in Assessment of Skills and Competency support the E-Learning theory.

Theory of Reasoned Action (Fishbein and Azjen, 2011) helped the researcher understand how influential outsiders are promoting change, and the faculty's intent to change to required mandates is paramount. Attitudes exhibited towards outcomes are motivating factors for Health Science faculty to alter instructional methods influencing the intent to conform to the virtual educational landscape. Faculty's belief in the outcome of virtual simulation and clinical sufficing
for educational purposes is evidenced by applying the Theory of Reasoned Action. Motivation to comply with online learning was evidenced by participants praising virtual simulation and excellent learning experiences for students. Participant 2 observed others throughout the pandemic and changed instructional practices instrumental in leading change with practice. Participant 2 mentioned barriers with technology skills, but the motivation to comply with belief in the desired outcome and intent to change produced the desired results. Emergent theme four: Faculty Appreciation of Changing the State of Practice through Course Redesign supports the Theory of Reasoned Action.

Transformative Learning Theory (Mezirow 1991) provided a lens through which the researcher examined the Health Science Faculty's instructional adaptations during the global pandemic. Disorienting dilemmas, such as global pandemics, required faculty members to reexamine current practices and revert to online teaching. Mezirow (1991) argues that making mental and behavioral shifts in practice was critical to learning online education and overcoming obstacles from a lack of resources. The Transformative Learning Theory helped with the faculty's rapidly adapting instructional methods and pivoting to online instruction. Mezirow (1991) posits ten phases transpire essentially to change behavior and mental processes. Faculty contended with a disorienting dilemma, the global pandemic that altered educational landscapes across the world. Self-reflection of anxiety and fear of the unknown with the rapid transition to online learning from face-to-face instruction contributed to the renewed assessment of expectations from the national, state, and local level and accreditation bodies overseeing the programs in Health Science Education. Dissatisfaction from the transformation to online learning modality contributed to changed practices and pedagogies. Mezirow (1991) posits investigation for new experiences contributes to changed behaviors; a prime example was the lack of time to
deliberate and plan new experiences that forced educators to utilize readily available teaching tools. Faculty debated between letter grades or pass-fail options and what components of the curriculum were essential and temporarily suspending distractors so the focus could remain on actual content. Gaining information to fulfill desired goals proved challenging for faculty to determine the program's goals and semester, but persistence and motivation were the essential components. Establishing proficiency and self-assurance in new associations and ultimately assimilating into the changed practices necessary to continue educating during the pandemic were paramount for faculty. Overall, participants mentioned challenges posed from the global pandemic, and the Transformative Learning Theory has direct application to Health Science Faculty experiences in the study. Participant 2 made mention of "Everything kind of had to move in a hurry, and time was lacking. I had to teach online without adequate technology skills and make do with a pretend laboratory setting at home." Overall, participants discussed challenges posed from online instruction from the pandemic and dissatisfaction with the altered landscape but altering mental processes and behavioral changes to accommodate the mandated changes. Emergent theme two: Shift from Didactic to Conceptual Contextual Learning supports the Transformative Learning Theory.

Conclusions

Findings of the study enabled the researcher to ascertain answers to the research questions. Conclusions are presented in this section.

RQ 1: How do Health Science faculty describe challenges emerging from the transition to online delivery of curriculum?

Abruptly pivoting to virtual learning amidst a global pandemic presented challenges with technology and lack of resources preparing students in Health Science programs. Responses
from focus group questions, individual interviews and online questionnaires provided narratives exemplifying trials endured. Relying on virtual platforms for previously face-to-face instruction health science programs are founded on required flexibility and persistence of faculty and students. Responses describing challenges posed transitioning to online instruction follow below in the narrative. P4 identified technology barriers, bandwidth, and obtaining devices for continued learning. Transferring learning online was challenging because we lost critical learning time moving content online. P6: recognized they were ill prepared to convert theory and skills online. P2: No access to clinical settings or the laboratories proved difficult to ensure skilled students were entering the workforce….no learning equipment for practicing skills. Supplies on campus were inventoried for local hospitals to assist with the anticipated surge of patients. P1: No medical supplies because the global pandemic had everything on backorder. All participants referenced removing the direct patient care and human element from learning which impeded developing multidisciplinary teamwork and establishing rapports. Challenges presented with assessing competency and demonstrating effectively with makeshift household items replacing the human element. Lack of access to clinical sites, the campus laboratory and learning materials during the pandemic forced educators to employ creativity and flexibility with grading practices and curriculum. Dewart et al (2020), asserts challenges in health science education demanded ethical consideration removing students from direct patient care experiences to protect the students professionally and personally. Pressures were mounting to continue learning without the human element and medical supplies, so planning for immediate needs and the future was paramount to produce skilled professionals into the critical shortages of workers. A majority of respondents identified employing creativity with instruction, grace in evaluation of students and persistence to assist students matriculating through programs towards program completion.
Responses demonstrate Health Science faculty were dedicated to student success and willing to navigate uncharted scenarios during unprecedented times in spite of challenges presented.

**RQ 2: What pedagogical strategies do Health Science faculty use to transition from face-to-face to online instruction?**

Didactic shift to conceptual contextual learning promoting content mastery was revealed from data obtained by participants in the study. Transitioning from face-to-face to virtual learning was a new approach for Health Science faculty participants. In fact, governing bodies of all participants never permitted removal of the human element historically, so waivers of prior mandates needed extended to continue learning. Without variances and alternative options for direct patient care removing the human element, learning would have halted. Removing the teacher-centered approach and switching to the student-centered approach was necessary for educators. Faculty members stated online instruction platforms with breakout rooms provided the only strategy available for continuity of learning. Serving more as a mentor was necessary throughout the pandemic and having students engage in learning activities outside of the classroom time was important.

Faculty members described strategies essential for virtual learning. Relying on pre-recorded lectures for students to view independently served all parties well. Synchronous online sessions were devoted to clarification of content not mastered and group activities for educators to assess content mastery and comprehension. Removal of clinical opportunities and learning on campus in the laboratory was an additional element needing addressed. Participants all asserted changing strategies of teaching hands-on skills within individual programs. P5: stated Pre-recorded skill videos from publishing companies were critical for learning so students were able to view anatomically correct hand placement, body positioning, and equipment necessary for
procedures. P2: Asking students to rely on household items when stay-at-home orders were implemented was the only option for practicing. Faculty asked students to record skills on family members or baby dolls so assessment could transpire to some degree. P7: A valuable asset critical for learning was virtual simulations and clinical opportunities. This was a continual theme identified by participants enabling students to learn prioritization, clinical reasoning and clinical judgment skills. Not optimal from any standpoint, but governing and accreditation bodies granted waivers to enable students the ability for program completion. Flipping the classroom was a strategy several participants mentioned to assist with student engagement, socialization and a means for continual assessment. Group activities in breakout rooms replaced classroom small group sessions. Kahoot games, Jeopardy games via Zoom were additional strategies beneficial for online learning.

Reducing rigor and assignments focusing on core content paramountl for student success were strategies identified by participants. Upon resuming face-to-face instruction, social distancing, masks, face shields, goggles and smaller class sizes were mandatory. This presented an additional element of creativity and strategic planning for Health Science faculty to instruct hands-on skills. Kanneganti et al (2020) argues post pandemic pedagogy in medical education will entail continued virtual learning with curricular changes focusing on PPE, hand hygiene and public health concerns. Responses by participants coupled with consultation with the literature exemplify technology resources and assuming the student-centered approach was the most significant strategy for continued education in Health Science programs.

**RQ. 3: How has the transition to online instruction changed the Health Science faculty approach to adapting instruction in laboratory and clinical settings?**
Transitioning to the online modality required virtual clinical and virtual simulation experiences for students to learn what historically was taught in long-term and acute care settings. The pandemic shuttered educational facilities and opportunities for clinical rotations, and alternative learning modalities needed consideration. Accreditation and governing bodies of Health Science programs were reluctant to adopt alternative learning experiences without direct patient care. A year into the pandemic with experience implementing virtual learning opportunities provided positive feedback of the experiences. Faculty indicated online learning opportunities provide enhanced experience for students even without direct patient care experience. Students remain actively engaged in learning and are able to advance at individual paces, providing customized learning. Students possess the ability to revise and review learning and make sound clinical judgments in a no-harm situation. Respecting the benefits from the virtual clinical and laboratory opportunities, Health Science programs should entertain keeping the learning resources in curriculum even after returning to full face-to-face atmospheres. Resuming on-site clinical rotations and laboratory experience is able to be enhanced by having students complete virtual learning prior to the hands-on learning. Deeper understanding of patient prioritization, clinical judgment, medication administration and best practice from virtual learning may enhance student performance when face-to-face. Rather than assuming an either-or approach, faculty are able to incorporate both opportunities to enhance programs and student comprehension and performance.

**Implications**

This research investigation produced findings that have implications for practice. A discussion of these implications is presented below.
Lack of pedagogy capacity

It is noteworthy that faculty learn from adversities employing virtual learning in Health Science disciplines during the global pandemic. Faculty and students thrust into the technological arena without time to prepare posed learning curves. Faculty reported leaving the profession and high attrition rates exemplify overwhelming challenges contended with amid the pandemic. A year later, dialogues are transpiring sharing best practices and success tips transitioning to virtual learning, especially in disciplines founded on face-to-face, hands-on learning. Extensive technology training was lacking for faculty and moving forward to ensure they are adept with technology and resources critical for successful programs. Faculty need strong support systems to ensure continued guidance is available when needed. Students also should be afforded support early in academic careers to prepare them for potential pivoting to virtual learning. Adequate computer supplies and access to bandwidth must be readily available to mitigate disruptions in learning. Alternative learning plans accessible for future disruptions in education are essential based upon what proved successful within the past year supported by research.

Didactic to Conceptual Contextual Learning

Health Science faculty transitioned from traditional pedagogy to delivery of content with virtual learning during the pandemic. Removal of direct patient care experience and the hands-on approach required innovation for student mastery of content. Virtual learning activities actively engaging students was employed replacing what historically transpired face-to-face inside the classroom, lab and clinical settings.
Shift in Assessment of Skills and Competency

Health Science faculty utilized virtual landscapes during the pandemic to evaluate student proficiency and ability to meet program objectives. Demonstration with recording skills and employing creativity with resources readily available at home were necessary for continued learning. Faculty in Health Science departments realized it was more challenging to assess student competency with virtual learning, but it permitted continued learning. Removing face-to-face interaction was challenging for instructor demonstration and student evaluation. Faculty struggled identifying comprehension levels and deliberated if students were obtaining knowledge necessary for successful program completion and national exams to enter the workforce.

Changing State of Practice and Course Redesign

The global pandemic prompted redesign of health science courses. Removing the human element was a common theme demanding innovation to provide robust learning experiences for students with the online platform not compromising education formally taught face-to-face. Replacing direct patient care experiences with virtual simulations and clinicals and relying on pre-recorded skill videos for demonstration were relied upon heavily. Faculty remained cognizant of the importance of adequately preparing students for matriculation through courses to enter the workforce as skilled individuals. The pandemic illuminated content areas needing readdressed that were most relevant for society today. Faculty across disciplines asserted significant changes in curriculum, assignments, and content delivery were mandatory during the pandemic, all foreign to instructors. Virtual learning is not optimal for health science education, but benefits were discovered from the virtual learning that will prove beneficial moving forward in the curriculum.


**Recommendations for Future Research**

The following recommendations are offered for related research in Health Science Faculty transitioning to remote learning from face-to-face and adaptations to instructional delivery.

1. Conducting a quantitative study on the subject to obtain a larger, more diverse population of participants in ethnicity and specialty areas.

2. The study was conducted during the global pandemic, and faculty were reluctant to devote time participating because of overwhelming conditions. A study on the topic in less pressing times could enhance participation and elicit more in-depth responses.

3. Conducting a comparative study of individual disciplines in Health Science Education departments to determine which area of study endured the most significant challenges and adaptations from the global pandemic.

4. Conducting a comparative study with veteran and novice educators to determine if the pandemic posed more significant challenges to one population or equally to both populations.

5. Conduct a longitudinal research study establishing financial impacts on Health Science programs during the pandemic and effects on tuition and students.

**Summary**

This study offered a qualitative perspective on the vital phenomenon of Health Science Faculty during a global pandemic and adaptations critical for continuing education without access to resources paramount for learning. Purposeful and snowball sampling of Health Science Faculty transitioning from face-to-face learning to the online modality during the global
pandemic shared lived experiences. The study's findings exposed pedagogic recontextualization
Health Science faculty employed to continue education when face-to-face learning and access to
resources are not readily available during a global pandemic. In summary, it is imperative to
ruminate the value Health Science Faculty provide to emerging professionals, especially in a
time of critical shortages of staff during a global pandemic.
References


Doi:http://dx.doi.org/10.1097/01.NEP.0000000000000187


Hew, K. (2019). Where is the “theory” within the field of educational technology research? https://doi.org/10.1111/bjet.12770


official journal of the National Organization for Associate Degree Nursing.

10.1016/j.teln.2020.07.005. Advance online publication.

https://doi.org/10.1016/j.teln.2020.07.005


Learning, A. (2017, September 17th). E learning (theory) - ELearning


McNarry, Jacquelyn Allen-Collinson & Adam B Evans (2019) Reflexivity and bracketing in sociological phenomenological research: researching the competitive swimming


Littler Mendelson P.C. https://www.littler.com/


doi:10.1177/074171369204200309


doi:10.1177/074171367802800202


Nowak, Marian K.; Speakman, Elizabeth; Sayers, Patricia Evaluating PowerPoint Presentations, Nursing Education Perspectives: January/February 2016 - Volume 37 - Issue 1 - p 28-31 doi: 10.5480/14-1418


Parsons, S. E. (1922). *History of the Massachusetts General hospital training school for nurses.*


*Pearson Vue.* (n.d.). Computer Based Test (CBT) development and delivery :: Pearson VUE. https://home.pearsonvue.com/


Woodham-Smith Cecil AJN, American Journal of Nursing: May 1951 - Volume 51 - Issue 5 - p 354


APPENDICES

APPENDIX A

Research Study Letter of Invitation

Dear Faculty Member:

My name is Kara De La Fosse, and I am a doctoral candidate in the Doctor of Education Program at Winona State University. I would like to invite you to participate in a research study I am conducting for my dissertation.

The purpose of this study is to explore how Health Science Faculty navigated learning during the global pandemic altering practices and pedagogies. I invite you to participate because you are currently serving as a faculty member in a Health Science program during the global pandemic.

Your participation will involve a 10-15 minute online questionnaire, an individual interview via Zoom, and a focus group session with all participants via Zoom.

Participation is voluntary, and you may withdraw from the study at any time without consequences. You may answer as little or as many questions as you desire. Clicking on the survey link serves as your consent to participate. Your original consent form will be placed under lock and key, separate from your reported responses to protect anonymity. Feedback and responses will remain confidential to the fullest extent permitted by law.

Thank you for your willingness to participate in this research study. If you have any questions or concerns, please feel free to email me at wyatt100@hotmail.com or call me at (330) 518-2447. The faculty sponsor of this study is Dr. Barbara D. Holmes. Email bholmes@winona.edu

Respectfully yours,

Kara De La Fosse

Doctoral Candidate

Winona State University
APPENDIX B

Consent Form:
Pedagogic Recontextualization in Health Science Education During a Global Pandemic: Faculty Perspectives on Instructional Adaptations

What is this research study about?
You are invited to participate in a research study designed to explore the experiences of Health Education faculty perspectives on instructional adaptations during a global pandemic. We hope to learn instructional modalities the relevance utilized during the pandemic.

What activities will this study involve?
If you decide to participate, you will be asked to participate in an individual interview, focus group, and complete an online questionnaire. The individual online interview will last approximately 45 minutes. The online focus group will be scheduled for 60 minutes, and the online questionnaire will take approximately 10 minutes.

How much time will this take?
The study will begin on November 1st and end on November 15th. Individual interviews will be scheduled via Zoom based upon participant’s availability. Online questionnaires will be completed when the timing works best for participants over the two-week period. The Focus group will be scheduled for the last mid-November. We estimate participating in the study will require 2 hours of your time.

What will be done with the data collected during this study?
The only individuals that will have access to the data are the researcher, dissertation chair, and advisory committee. The Family Educational Rights and Privacy Act (FERPA) requires the confidentiality of your information with this study and will be adhered to. Your identity will remain protected and confidential, and ethical standards will be adhered to. The signed consent will become part of the research documents. You may request a copy of this consent at any time.

Each participant will be assigned a code to protect anonymity. When participants log on Zoom, they will have the code listed as their identity and not their name. Participants will be asked to have their cameras off to further protect identity. The computer utilized for data collection has password protected and has anti-virus software.

All information collected will be stored in a locked cabinet in the researcher’s home. When the study is completed, data will remain in a locked cabinet for five years and then professionally shredded.

Are there any risks for participating?
There are no appreciable risks from participating in this study to health and safety. The only risk posed is Zoom having access and rights to the video recordings.

Are there any benefits to participating?
The benefit of the study is to add to the body of literature providing guidance to future educators.

What are my rights as a participant?
Participation in this study is voluntary, and you may stop at any time. You may decide not to participate or to discontinue participation at any time without penalty.

**Who can I contact if I have questions or concerns about this study?**
The main researcher conducting this study is Kara De La Fosse, a student at Winona State University. Dr. Holmes is the faculty advisor for this study. Dr. Holmes may be reached at bholmes@winona.edu or (507) 457-5651. You may ask any questions you have about the study and your participation now or later during the study.

**Who can I contact if I have questions about my rights as a participant?**
If you have questions or concerns about your participation in the study, contact the Human Protections Administrator Brett Ayers at 507-457-5519 or bayers@winona.edu. This project has been reviewed by the Winona State University Institutional Review Board for the protection of human subjects.

You will be given a copy of this form to keep for your records.

**Agreement to Participate**
Participation in this study is voluntary. You may withdraw at any time without any consequences. Your signature indicates that the study has been explained, you have had an opportunity to ask questions, and you have decided to participate.

Your signature: ___________________________________________ Date _______

Your name (printed): ________________________________

Signature of person obtaining consent: __________________________ Date ___________

Name of person obtaining consent (printed): __________________________
APPENDIX C

Online Questionnaire Protocol

Welcome, and thank you for your participation in this research study interview. My name is Kara De La Fosse, and I am a doctoral candidate in the Doctor of Education program at Winona State University, Winona, Minnesota. I am conducting research for my dissertation study. The purpose of this study is to explore the experiences of Health Science faculty navigating learning amid a global pandemic and identifying changes within the program necessary to meet outcomes and learning objectives.

This questionnaire will take approximately ten minutes and includes questions about your experience as a faculty member in Health Science during the global pandemic. Identities will remain anonymous, and a code will be assigned to each participant. No collection of IP addresses will be collected. You may opt to discontinue the questionnaire at any point during the interview. Responses will remain confidential at all times during. Your contribution to the study may provide insight into best-practice strategies of Health Science faculty with altered educational landscapes promoting student success.

You are granting consent by clicking on the survey link. The original copy of the informed consent will be placed under lock and key, separate from your reported responses.

Participation is completely voluntary, and you may withdraw your participation at any point without consequences.

Questionnaire questions

1. What is your age?
2. What is your gender?

3. What is your ethnicity?

4. What is your area of specialty in Health Science Education?

5. How many years have you served in the profession?

6. What has been your most significant challenge instructing during the pandemic?

7. How did you meet accreditation body mandates for face-to-face instruction?

8. How have you redesigned lessons to accommodate online instruction?

9. Have you changed grading practice or curricular content during the pandemic?

10. What resources were most significant teaching during the pandemic?

11. What areas of curriculum have been modified to accommodate the transition to remote instruction?

12. Describe how the global pandemic affected planning moving forward.

Thank you for your participation in this study.
APPENDIX D

Individual Interview Protocol

Welcome and thank you for your participation in this individual interview. My name is Kara De La Fosse and I am a doctoral candidate in the Doctor of Education program at Winona State University, Winona, Minnesota. I am conducting research for my dissertation study. The purpose of this study is to explore how Health Science faculty transitioned learning online and changes in practice and pedagogy.

This individual interview will take approximately 45 minutes and includes information about your lived experiences as a faculty member during the global pandemic. For the purpose of this study, and to maintain your anonymity, a code will be assigned to protect your identity. Our session will be recorded via Zoom, and I would like your permission to enhance the accuracy of documentation of the data obtained. Please note that Zoom has a disclaimer they own recordings. If at any point in the interview, you desire to stop the recording or the interview, please let me know immediately. Your responses will remain confidential. Your contribution to the study may provide guidance on ways to deliver optimal instruction online in the future.

At this time, I would like to remind you of your written consent to participate in this study. You will receive a signed copy of the informed consent, too. The original signed copy of the informed consent will be placed under lock and key, separate from your reported responses.

Your participation in this individual interview is completely voluntary. If at any time you need to stop or take a break, please inform me. You may also withdraw your participation at any
time without consequence. Do you have any questions or concerns before we begin? With your permission, we will begin the interview.

Demographic Questions:

1. What is your current position?
2. How many years have you served in this position?
3. What is your gender?
4. What is your ethnicity?
5. What is your age?

Interview Questions:

1. What resources did you use transitioning from face-to-face learning to online?
2. What resources were you lacking transitioning from face-to-face to online?
3. What techniques did you employ to instruct skills requiring hands-on learning?
4. How did you assess student competency with remote learning?

Thank you for your participation in this study.
Welcome, and thank you for your participation in this research study focus group. My name is Kara De La Fosse, and I am a doctoral candidate in the Doctor of Education program at Winona State University, Winona, Minnesota. I am conducting research for my dissertation study. The purpose of this study is to explore Health Science faculty during a global pandemic pivoting to remote learning and perceptions of practice and pedagogy.

This focus group will take approximately 60 minutes and include questions about your experiences as a faculty member in Health Science programs during the pandemic. For the purpose of this study, and to maintain your anonymity, a code will be assigned to protect your identity. No IP addresses will be collected. If at any time during the focus group you wish to discontinue, you may do so. Your responses are and will remain confidential. Your contribution to the study may provide insight on strategies to enhance online learning in Health Science programs.

Participation in this focus group is voluntary, and you are free to answer as many or as little questions that you desire. The session will be audio-recorded to ensure that no data is missed in the report. Your camera will remain off, and your name will be a code. Please note that Zoom has a disclaimer they own rights to the recording.

The session will be structured so individuals can respond to each question in order of assignment based upon your identification code. Each question will be addressed in the same order to ensure each participant answers each question (round-robin). Upon completion of all
participants answering, additional time will be provided for all individuals to provide additional information, if desired.

Your participation in the focus group is voluntary, and you may withdraw your participation at any time without consequences.

**Focus Group Interview Questions**

1. What is your gender?
2. What is your ethnicity?
3. What is your age?
4. What is your current position?
5. How many years have you served in the position?
6. What teaching approaches did you find successful with teaching face-to-face?
7. What adjustments were necessary to effectively convey content with the online modality?
8. How did the pandemic alter instruction of skills taught face-to-face requiring return demonstration?
9. What alternative learning approaches were adopted during the pandemic in Health Science programs?
10. How helpful is your teaching experience in redesigning courses and lessons for the online modality?

Thank you for your participation in this study.
Resume

Kara R. De La Fosse, MSN, RN, BSN, PHN, BS. Ed
103 S. Dogwood Ave
New Richland, MN 56072
(330) 518-2447

Objective- My passion is education and helping others flourish to obtain their end goals. Meetings students on their individual level is important to me as I value their individuality and respect that we all learn from different methodologies.

Professional Experience-
Riverland Community College- Director of Nursing Assistant/Home Health Aide Program. (2016-Present)
I also teach in the Registered Nurse, Practical Nurse, TMA and MA programs.

Presentation College- Clinical Instructor adjunct RN, Critical Care Online Nursing Theory Instructor- 2017 to 2018. (The college closed near me).

Mayo Clinic Health Systems Albert Lea- Medical Surgical Floor and Intensive Care Unit
Registered Nurse May 2016- August 2017

Mayo Clinic Health Systems Austin- Intensive Care Unit
Registered Nurse November 2014- May 2016

Mapleton Community Home, Mapleton, MN
Registered Nurse June 2013- October 2014

Elm Homes, Waseca, MN
Residential Instructor for mentally and physically disabled individuals July 2007- 2012

New Richland Care Center, New Richland, MN
Certified Nursing Assistant June 2007 April 2009

Austintown Public School, Austintown, Oh
First grade school teacher 2002-2003

Education
Winona State University Doctorate of Education(Ed.D)
June 2019- May 2021

Walden University, MSN - Nurse Educator
June 2015- July 2016 completion.
Winona State University, BSN- Rochester, MN
Bachelor of Science in Nursing, RN 2014-2015
Public Health Nurse License 2015
Riverland Community College, Austin, MN
RN associate degree 2012-2014 3.7 GPA

Riverland Community College, Austin, MN
LPN 2012-2013 4.0 GPA

Youngstown State University, Youngstown, Oh
Bachelor Degree in Early Childhood Education (Pre k- 3rd grade)
4.0 GPA, Suma Cum Laude

Honors and Distinctions:
4.0 GPA Presidents list
Suma Cum Laude
The Trustee Emeritus Robert Erickson Scholarship
Elliot and Claire Dubinsky Scholarship
Kappa Delta Pi Member
Golden Key International Honour Society
Kappa Delta Pi ETA Xi Chapter
NAYEC Member