DOES THE PHYSICAL ACTIVE LEARNING CLASSROOM MATTER? FACULTY
EXPERIENCES PRACTICING ACTIVE LEARNING DURING AN ERA OF RAPID
TRANSFORMATION IN HIGHER EDUCATION

by

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An applied dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Education in
Educational Leadership

Charlotte

2023

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ABSTRACT

JULIE A. KEITH-LE. Does the Physical Active Learning Classroom Matter? Faculty Experiences Practicing Active Learning During an era of Rapid Transformation in Higher Education. (Under the direction of DR. LISA R. MERRIWEATHER)

Student-centered active learning strategies have been found to have a positive impact on student learning outcomes when compared to courses using traditional lecture methods in higher education. The practice of active learning is strongly linked to physical active learning classrooms (ALCs). Comprehensive studies show ALCs outperform traditional classroom settings in student satisfaction and student learning outcomes. The COVID-19 pandemic forced faculty practicing active learning in physical spaces into virtual learning environments for an extended period of time and the impact on active learning practice was unknown. The purpose of this exploratory descriptive case study was to understand the experiences of faculty learning community (FLC) members practicing active learning strategies in virtual learning environments to discover how teaching in virtual spaces for an extended period impacted the use of active learning strategies in physical classrooms. Results of semi-structured interviews conducted with 10 faculty members from the case study institution revealed three overarching themes about practicing active learning strategies in virtual learning environments (VLEs) and subsequent changes that emerged when participants returned to physical classrooms: (1) Working the Room (2) It's Not in the Syllabus (3) Virtual In-Person Classrooms (VIPCs). Participants largely reported attempting to replicate what they were doing in physical ALCs in VLEs using digital tools. Participants described being in a constant cycle of learning about and trying out new digital tools that could help them practice active learning strategies online. Pressure from the institution to make supportive changes on-demand as needs were identified to "pivot" also led to

a constant repetitive change cycle. Increased student access to laptops, the use of online digital tools, and the ability to leverage equitable access to technology in any type of classroom after faculty and students returned from VLEs to in-person classrooms presented participants with new ways to practice active learning strategies. Findings from this study show that these changes have created a new type of learning environment, the virtual in-person classroom (VIPC). The VIPC is the best of both worlds, it leverages the strengths of digital tools, online methods of communication, and remote engagement strategies used in VLEs and situates them in a physical learning environment that is friendly to practicing active learning strategies.

Keywords: ALCs (active learning classrooms), FLC (faculty learning community), VIPC (virtual in-person classroom), VLEs (virtual learning environments), online learning.

DEDICATION

This dissertation is dedicated to my beloved daughter Stella.

Dearest bumble bee – I know it has been a long time that you have seen me working on this paper. I remember when you told me you thought I was getting paid to go to school at night and on the weekends and how astonished you were when you realized that I was doing this all for free. I know it seems to you that all I ever do is work. I feel that too. I have been working hard for a reason though, and that reason is for you. I want you to know that no matter where you are in your life, no matter what has come before, you can always choose a future that fulfills your dreams. I always dreamed of earning a doctoral degree, I dreamed of a career in academia, even when I was younger than you are now. Today, I have a new dream. One that uses this degree to open doors for you to fly as high as your dreams take you.

This is one of my favorite quotes and has inspired me countless times in life. I hope you find inspiration in it as well.

"It is never too late to be who you might have been."

George Eliot (AKA Mary Ann Evans)

PS. The everything bagel reference is for you.

ACKNOWLEDGEMENTS

I would like to acknowledge the following persons for your support throughout my dissertation journey.

My family, who has supported and believed in me and always assured me that my dream of achieving this educational milestone would come to fruition. Specifically, my husband, Ngoc Le (the love of my life and my go to "pun-master"), my daughter Stella Keith-Le, my son Chance Rowan, my parents Maurice and Ann Keith, and my best friend, intergalactic sister, and personal librarian Beth Auten.

My dissertation chair, Dr. Lisa Merriweather. Thank you for being the most supportive and caring chair I could have ever hoped would choose to work with me. Your guidance and motivation kept me going when I didn't believe that I could go on. You kept me on track. It is because of your mentorship that this dissertation reflects the artistic side of my research process. My committee members, Dr. Mark D'Amico, Dr. Beth Oyarzun, and Dr. Kim Buch. Thank you for serving on my committee and for being my biggest advocates. I am honored to have each of you supporting me on this journey.

Thank you to Dr. J. Garvey Pyke, Executive Director of the UNC Charlotte Center for Teaching (CTL), for supporting my research and this study. Thank you to my CTL colleagues and beyond for your time spent brainstorming with me on white boards and for inspiring and encouraging this study. Special thanks to Dr. Kiran Budhrani for your unwavering support and for always being there for me. To Dr. Heather McCullough, your steadfast belief in me was instrumental in finishing this degree. To Jessica Kapota, I am eternally grateful to have you in my life, your friendship and opinion has meant a great deal to me when I needed it the most.

My friends. I promise I can say "yes" now! I am ready to learn how to have fun again.

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LIST OF ABBREVIATIONS

A.I.	artificial intelligence
ALA	active learning academy
ALC	active learning classroom
CoP	community of practice
COVID-19	Coronavirus disease 2019
CV	curriculum vitae
FLC	faculty learning community
HyFlex	hybrid-flexible
ICAP	interactive, constructive, active, passive
LMS	learning management system
OLC	online learner collaboration
PAIR-up	partner, pedagogy, assess, integrate, innovatively, revisit
PST	pedagogy, space, technology
SARS-COV-2	severe acute respiratory syndrome coronavirus 2
SASS	student assistance and support services
SCALE-UP	student-centered activities for large enrollment university physics (2000)
SCALE-UP (2003)	student-centered activities for large enrollment undergraduate programs
SCALE-UP (2014)	student-centered active learning environment with upside-down pedagogies
SoTL	scholarship of teaching and learning
TEAL	technology-enabled active learning
TILE	transform, interact, learn, engage

UNC	University of North Carolina
UNICEF	United Nations Children's Fund
VIPC	virtual in-person classroom
VLE	virtual learning environment
VR	virtual reality
VR ALC	virtual reality active learning classroom

CHAPTER 1: INTRODUCTION

In one of the largest and most comprehensive studies conducted on undergraduate students in higher education, Freeman et al. (2014) empirically validated the use of active teaching and learning practice in the classroom and called into question the continued use of the traditional lecture. When used in higher education, student-centered active learning strategies have been found to have a positive impact on student learning outcomes when compared to courses using traditional lecture methods (Chickering & Gamson, 1987; Freeman et al., 2014; Michael, 2006; Prince, 2014). Active learning strategies have been embraced by higher education and support for faculty development focused on student-centered teaching in student-centered learning environments is commonly found at colleges and universities (Baepler et al., 2016; Birdwell & Uttamchandani, 2019; Callens et al., 2019; Eby & Lukes, 2017; Elliot et al., 2016; Levesque-Bristol et al., 2019).

Comprehensive studies show active learning classrooms (ALCs) outperform traditional classroom settings in student satisfaction and student learning outcomes (Baepler et al., 2014; Biechner et al., 2007; Brooks, 2010; Chiu & Cheng, 2016; Cotner et al., 2013). These student-centered physical learning environments, customized for the practice of active learning strategies, accounted for 76% of technology-enhanced learning environments at colleges and universities when EDUCAUSE released the 2019 Horizon Report for Higher Education (EDUCAUSE, 2019). In 2019, learning environment design was already experiencing a paradigm shift from physically embedded technology to flexible, technology enhanced spaces designed to support both the in-person and the virtual campus of the future. The lines between the physical and virtual classroom are blurred now more than ever.

Statement of the Problem

The practice of active learning is strongly linked to physical learning environments called active learning classrooms (ALCs) (Cattaneo et al., 2017; Temple, 2008). The COVID-19 pandemic forced faculty practicing active learning in physical spaces into virtual learning environments for an extended period of time, and the impact on active learning practice was unknown. Since Chickering and Gamson (1987, 1999) identified active learning principles as one of seven best practices for undergraduate education teaching and learning, academic institutions have provided resources and support for faculty professional development promoting teaching and learning pedagogies that favor active learning strategies. This has included construction of specialized physical learning environments, ALCs, to support these practices. Coinciding research on teaching and learning in higher education confirmed that the use of active learning strategies significantly contributed to improved student outcomes (Beichner et al., 2007; Braxton et al., 2000; Chi & Wylie, 2014; Freeman et al., 2014; McLean et al., 2016; Prince, 2014; Wilson et al., 2007). The documented shift in higher education teaching practices, from faculty-centered to student-centered, is illustrated in several active learning continuums (Bonwell & Sutherland, 1996; Keith-Le et al., 2020; Lord et al., 2011, O'Neal & Peter-Grover, n.d.).

Active learning strategies have developed over the years as more educators get on board with changing pedagogy. Aragon et al. (2018) found that an instructor's mindset about student learning–either fixed or growth–was crucial to their ability to adopt and successfully practice active learning strategies in their classrooms. Chi and Wylie (2014) examined student behaviors associated with traditional active learning strategies in physical ALCs and found that optimal cognitive engagement occurred when faculty used learning strategies that were interactive; interactive learning strategies successfully led to deeper learning when compared to constructive,

active, and passive learning strategies illustrating maturing active learning practices. Active learning was advancing and evolving, engaging more faculty and students, pushing the traditional lecture model out of the physical classroom across disciplines, when everything changed in ways outside everyone's experience.

In late 2019, the emergence of severe acute respiratory syndrome coronavirus-2, or SARS-CoV-2, led to the COVID-19 pandemic that forced most higher education institutions into online emergency remote teaching in March of 2020. At the time, the notion that almost every educator would deliver their courses fully online, all at the same time, seemed inconceivable (O'Keefe, 2020). Yet, within a matter of weeks, the rapidly-spreading viral illness forced almost every higher education institution to either close or move to remote instruction (O'Keefe, 2020).

The United Nations Children's Fund (UNICEF) surveyed educational institutions globally and found that 94% of countries represented, including the United States, implemented some type of remote learning when the COVID-19 global pandemic closed schools in the spring of 2020 (UNICEF, 2020). While this was the first time the majority of Americans had experienced a disruption of this magnitude to every aspect of their lives due to a pandemic, the event was not entirely unprecedented in educational history. During the 1918-1919 influenza pandemic, many schools stayed open by carefully watching the health of students and using quarantine as a tool to control the spread, while other schools closed entirely for 15 weeks or more (Foss, 2020). In 1937, radio broadcast technology was used during a polio epidemic to continue delivering lessons. The COVID-19 pandemic rapidly changed how higher education functioned and many faculty and students embraced blended learning environments and the flexibility that came along with virtual courses (EDUCAUSE, 2021). The quick pivot to virtual learning environments, dubbed "emergency remote learning," opened lines of communication

between faculty and students in a world that had been shut down to varying degrees (Hodges et al., 2020). The forced move to virtual learning experienced during the pandemic revised views of how and where higher education could be delivered and consumed and forever changed expectations of what the college classroom experience should be.

As the COVID-19 pandemic stretched into the spring of 2021, many college courses remained fully online, and faculty felt the pressure of student expectations for quality online college experiences (Jeong et al., 2019). An examination of reported plans for spring course delivery from approximately 3,000 institutions found 3% were fully online, 40% were primarily online, 2% were fully in person, 16% were primarily in person, 9% were hybrid, 25% were undetermined, and 5% reported "other" (College Crisis Initiative [C2i], 2021; Tracking colleges' spring-reopening plans, 2021). Regarding plans for the fall of 2021, institutions focused conversations on options that would allow for campuses to safely reopen (Thomason & O'Leary, 2021). At the site of this case study, the University of North Carolina at Charlotte (UNC Charlotte), this looked like face-to-face classes resuming at pre-pandemic levels, residence halls at full occupancy, university employees returning to their offices, all campus services being offered in person, all buildings and facilities reopened at regular capacity (including dining halls and recreational centers), and sporting events planned within the guidelines allowed by the county and the state (UNC Charlotte, 2021). UNC Charlotte (2021) planned to execute this reopening by requiring the wearing of face coverings and encouraging faculty, staff, and students to get vaccinated. The push to return to as close to pre-pandemic normalcy as possible was crucial to institutional health and in many ways a survival tactic. While UNC Charlotte had maintained student course completions and graduations in virtual environments between March

2020 and July 2021, the organizational changes required by all involved were expensive and exhaustive.

Barber et al. (2013) warned in *An Avalanche is Coming* that the model of higher education practiced over the past two decades was broken, antiquated, and at risk of total collapse due to the tradition of slow incremental change and adaptation. Higher education was compared to a snow-covered mountainside with diverse and fractured changes occurring beneath the surface that could trigger an avalanche, necessitating 30 years' worth of change occurring in a very short period if institutions were to survive. The COVID-19 pandemic triggered an avalanche for academia, and the extended time spent teaching in virtual learning environments revealed flexible and successful models of teaching and learning that had not been experimented with before in physical learning environments. Faculty at UNC Charlotte had just spent 17 months teaching primarily in virtual learning environments. The pivot from remote learning to in-person return-to-campus learning environments presented new challenges for instructors and administrators.

While research is emerging on the long-term impact of the pandemic on active teaching and learning (Moorhouse, 2020; Nepal & Rogerson, 2020; Ozadowicz, 2020; Venton & Pompano, 2021; Yannier et al., 2021), implications for the future of active learning strategies have not been analyzed from the perspective of a faculty learning community at an institution firmly invested in practicing active learning in physical active learning classrooms. Charlotte was an intriguing case study site to explore this phenomenon as there is a commitment from leadership to stop constructing new lecture halls and renovate existing classrooms to be ALCs; as of 2019 there were 20 ALCs in use or in the process of being renovated, with plans to focus on new large-scale ALCs going forward (Keith-Le et al., 2020). In addition, the university's Center

for Teaching and Learning facilitates a large faculty learning community that focuses on professional development activities supporting the practice of active learning strategies in ALCs and boasts diverse faculty participation from all colleges across campus (Keith-Le et al., 2020).

Purpose of Exploratory Descriptive Case Study

The purpose of this exploratory descriptive case study was to understand the experiences of faculty learning community (FLC) members practicing active learning strategies in virtual learning environments to discover how teaching in virtual spaces for an extended period of time impacted the use of active learning strategies in physical classrooms.

Research Questions

This study was guided by two research questions:

1. How did faculty learning community members practice active learning strategies in virtual learning environments?

2. How did the experience of practicing active learning strategies in virtual learning environments for an extended period of time influence how active learning strategies are practiced in physical classrooms?

Overview of Research Methodology

A qualitative, exploratory and descriptive case study design was used in the context of the COVID-19 pandemic. The phenomena of the whole of higher education having to move into a virtual environment for an extended period of time due to a pandemic is novel. As there is no prior research found on this phenomenon, an exploratory design was employed (Yin, 2018). An exploratory design is also used because the problem is not clearly defined; the research explored in what ways it changed teaching and learning practices, with a focus on describing the use of active learning strategies. The research was retrospective in nature, as data collection looked

back at participants' memories of experiences that occurred during the pandemic. The research findings are descriptive since they present a rarely encountered situation that has not been accessible to researchers in the past (Yin, 2014).

The researcher in this exploratory descriptive case study gathered data from faculty participants of the Active Learning Academy (ALA), a faculty learning community focused on using active learning strategy in active learning classrooms at the University of North Carolina at Charlotte, a large, metropolitan public university in the Southeastern United States. Purposeful sampling using specific criteria applied to FLC members willing to participate in the study was the basis for the study population. Access to secondary data about FLC participation was used to help identify the faculty recruited. The ideal population for this study were instructors deeply engaged in active learning strategies, teaching in ALCs, and participating in the Active Learning Academy FLC. Ensuring that the faculty recruited had also taught in traditional classrooms helped with the trustworthiness and validity of the data and was used to triangulate the lived experiences examined during the data analysis.

Semi-structured interviews with study participants were conducted using web-based recording software and an interview protocol including a guide. Verbatim transcriptions of the recordings were ordered from a transcription service. Member checks, or respondent validation, was used to ensure trustworthiness and validity of the data collected (Barbour, 2001). Data from the member-checked qualitative interviews were analyzed using the process of open, axial, and selective coding to discover emerging themes from faculty experiences (Strauss & Corbin, 1990).

Theoretical and Conceptual Frameworks

This research explored and described the unique phenomena experienced by study participants through the lenses of a theoretical framework of change management and a conceptual framework for designers and users of learning environments. These frameworks support both research questions that guided this study.

Lewin's 'Changing as Three Steps'

While many theories of change exist, Lewin's (1947) 'changing as three steps' model (see Figure 1) is simple and powerful, and best suited the novel scenario experienced by the participants of this study.

Figure 1

Lewin's Changing as Three Steps (CATS) Model

Note. Frozen is an organization's natural state until an intervention comes along and disturbs this, causing the organization to unfreeze and change. Refreezing change(s) creates a new natural state for the organization (Cummings et al., 2016).

Lewin is considered the source change management theory, and the model 'changing as three steps' (unfreezing > changing > refreezing) is regarded as the foundational model for which all change management models of human systems are originally derived (Cummings et al., 2016; Schein, 2010). The broad application of Lewin's model provides a solid basis for explaining change management (Cummings et al., 2016). Lewin (1947) explained that successful and permanent change includes three aspects described as moving through levels. Unfreezing occurs at level 1 (L1), then change occurs at level 2 (L2), then refreezing of the organizational

life occurs at level 3 (L3) (Lewin, 1947). An organization's force field must be altered under extreme psychological conditions for changes to stick, because change for the sake of change, or change due to a shock to the system, is unlikely to result in permanent behavioral changes and typically result in a push for an immediate return to previous behaviors and maintenance of the group norm as soon as possible (Schein, 1996). Permanency of change is determined by the level's force field and how secure it is against additional changes (Lewin, 1947).

Schein (1996), in writing about Lewin's model of change, pointed out that change must be tied to something that individuals within the organization care deeply about, something that will trigger survival instincts and feelings of anxiety, whereby if the change does not occur, individuals will feel they have failed to meet organizational goals and may experience survivor guilt. This psychological impact on individuals within an organization is what allows for the change that is occurring to become permanent.

Lewin's (1947) 'changing as three steps' model provided a framework to explore the experiences of the sample population studied at UNC Charlotte during the COVID-19 pandemic. The university's initial state (FLC members practicing active learning strategies in ALCs) when the pandemic began represents Lewin's (1947) level 1 natural state of the organization that was unfrozen, while level 2 encompasses all the changes that occurred during the move to virtual learning environments and then the return to campus 17 months later. The new normal represents the changes that have stuck (refrozen) and are now part of the organization's new natural state.

Radcliffe's Pedagogy-Space-Technology (PST) Framework

Radcliffe's (2009) Pedagogy-Space-Technology (PST) framework (see Figure 2) is an iterative tool for designers and users of learning spaces to reflect on how each element influences the others.

Figure 2

Radcliffe's Pedagogy-Space-Technology (PST) Framework
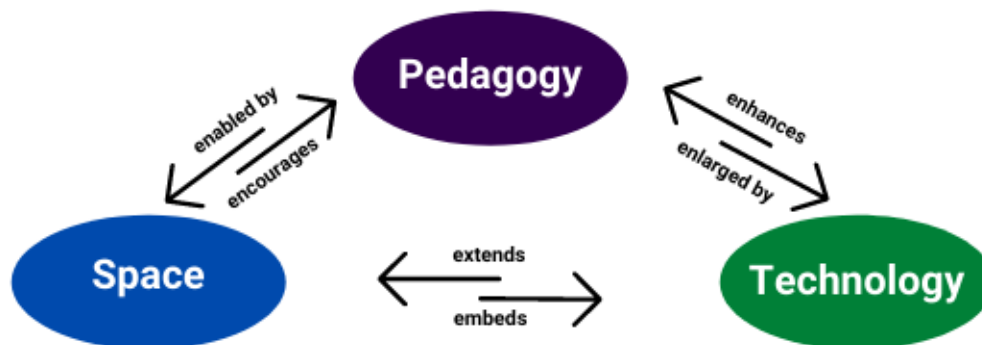
Note. Radcliffe (2009) presents this framework as a way of assisting diverse stakeholders in the creation, operation, and evaluation of physical learning environments.

Factors such as evolving social patterns, generational expectations, changing fiscal landscapes, ubiquitous emerging technologies, and a shift to student-centered teaching and learning have resulted in the construction of learning environments that consider technology and pedagogy in their design (Radcliffe, 2009). By considering the space as well–for example, the environment, furniture, and other fittings–classrooms of the future are optimized for the use of active learning strategy, not just filled with the latest technologies.

The PST framework is broad enough to be tailored to meet the needs of specific institutions' use cases (Radcliffe, 2009). Trends in active and collaborative learning are creating new types of learning spaces that are not focused on hard-wired technologies alone, but also on social interaction and strategies that reach outside of the classroom and encompass the entire campus as an interactive learning platform (Oblinger, 2005). For this reason, the PST framework was ideal to consider in the study of UNC Charlotte's faculty who were teaching in physical active learning classrooms, then abruptly moved to virtual learning environments for 17 months

before returning to the specialized ALCs. This study leveraged the PST framework as a lens to explore and describe the relationships between ALC user experiences at UNC Charlotte, specifically changes that may have occurred to active learning strategies (pedagogies) in both virtual learning environments and ALCs (spaces) because of the tools leveraged during the extended period teaching fully online (technologies).

Lewin's (1947) 'changing as three steps' model frames the organizational experience UNC Charlotte's faculty, the study's participants, were operating within during the time being studied, while Radcliffe's (2009) PST framework provided a lens to situate the experiences of practicing active learning strategies in virtual and physical learning environments throughout a pandemic. These two theoretical and conceptual frameworks came together and provided a groundwork for exploring and describing a novel phenomenon.

Significance of the Study

This was the first time that higher education had faced a pandemic with the technologies at hand to continue to facilitate learning from a distance and replicate the experiences of faculty and students being together in a classroom. This study explored and described uncharted territory and sought to address four significant areas of impact.

- First, the study informs scholarly knowledge in teaching and learning by adding to the literature about the practice of active learning strategies implemented in physical learning environments and in virtual learning environments at an institution of higher education in the United States.

- Second, this study highlights the diverse ways in which strategies are used in both virtual and physical learning environments by faculty practicing active learning strategies, with specific focus placed on practice in ALCs.

- Third, this study is specifically significant to the case study institution and to elements currently being implemented to promote the scaling-up use of active learning among their faculty. Findings addressing professional development for faculty (the Active Learning Academy), learning environment design and construction of future ALCs, and active learning strategy use in virtual learning environments emerged and are discussed in Chapter 5.

- Fourth, this study is significant to all institutions of higher education that use student-centered teaching and learning practices like active learning strategies and active learning classrooms by contributing to the body of research on emerging changes to teaching practices in learning spaces brought about by the COVID-19 pandemic.

Overall, this study is significant in that it springboards off a growing body of research calling for change throughout higher education as it explored a specific novel event that catapulted higher education into rapid change out of a need to sustain its existence. This study sought to explore and describe how the increased use of virtual learning environments during the extended time spent in VLEs due to the COVID-19 pandemic may have informed the use of active learning strategies in physical classrooms going forward, thus highlighting emerging practices in teaching and learning.

<div align="center">**Limitations, Delimitations, and Assumptions**</div>

The study arose from an intense curiosity about the lived experiences of FLC members teaching in specialized physical active learning classrooms during the change in course delivery format due to the COVID-19 pandemic. A limitation of this study was that it was based on faculty perceived memories of what occurred during a stressful period that stretched over years. Findings will be limited by each participant's style of practicing active learning strategies and/or

what type of ALC they taught/teach in, how they use the learning environments, and other pressures out of the researcher's control.

A delimitation of this study is that it was a case study, conducted at one public university, in one geographical region of the United States, and was thus subject to the norms and practices of the place in which it was situated. As the study was a case study, it cannot be assumed that the findings could be replicated at other colleges and/or universities. However, this study should be replicable to the extent possible at other institutions of higher education, public and private, small, and large, within the US and outside the US, who embrace active learning strategies and build and use active learning classrooms, to determine if there is a pattern in the findings that inform the practice of active teaching and learning and the use of ALCs going forward. The study is also delimited by the population interviewed. The sample of faculty selected was not random; they were purposefully selected based on predetermined selection criteria and the prior knowledge of the researcher. There is a risk this could have skewed the results, which is addressed specifically in the research methods.

Assumptions include that this researcher did everything possible to not influence the participants responses to interview questions and that the participants shared honest and truthful recollections of their lived experiences.

Definitions of Terms

Several terms were used throughout the preparation of the findings of this research study.

Active learning. For the purposes of this study, "Anything that involves students in doing things and thinking about the things they are doing" (Bonwell & Eison, 1991, p. 2) is active learning. The opposite of a traditional lecture where students passively listen to the faculty member lecture.

Active learning classroom (ALC). For the purposes of this study, learning environments that have been customized to support active learning strategies are referred to as active learning classrooms (ALCs).

Active learning strategy/strategies. For the purposes of this study, the practice of teaching and learning previously defined as active learning and referred to in the literature as active learning pedagogy, active learning practice, active learning methodology, and active learning methods are referred to as active learning strategy or strategies. Examples of popular active learning strategies include flipped classroom, team-based learning, project-based learning, problem-based learning, group discussion, debate, role play, simulations, games, peer teaching, in-class writing, and pair and share.

Faculty learning communities (FLCs). For the purposes of this study, faculty learning communities are defined as learning communities that faculty join for professional development that are issue-focused, with the issue in this study specifically being the practice of active learning strategies.

Learning environments. For the purposes of this study, learning environments are used to describe the spaces where students are interacting with the faculty and their peers. This definition includes in-person classrooms (traditional lecture halls, row seating, labs, and active learning classrooms) and virtual learning environments (web conferencing software, learning management systems, and cloud-based tools).

Traditional classrooms. For the purposes of this study, learning environments that are contrasted with active learning classrooms are defined as traditional classrooms. Examples of traditional classrooms include theater-style lecture halls; large and medium lecture halls with fixed seating (with or without articulated-arm writing spaces); lecture halls and classrooms

where tables and chairs are fixed in place and orient toward the front of the classroom only; and classrooms where furniture, while mobile, is so heavy or unwieldy that reconfiguring it for each class is not feasible.

Virtual learning environments. For the purposes of this study, virtual learning environments (VLEs) are used to describe online spaces that faculty and students use to communicate and engage with each other to learn about a defined topic or subject through a planned academic course. This definition will include asynchronous, synchronous, bicnronous, and HyFlex courses, where all learning is delivered remotely using web conferencing software, learning management systems, cloud-based tools, and third-party software and systems.

Organization of the Study

Years of reinforced findings on the use of active learning strategies and their positive impact on student outcomes, and on courses located in specialized active learning classrooms and their positive impact on student success, thoroughly permeated institutions of higher education. UNC Charlotte is a good example of an institution that embraced the use of active learning strategies and active learning classrooms across the organization, with top-down leadership support, strategic renovation of existing classrooms, and a large faculty learning community supporting and promoting active learning strategies. Understanding how the rapid changes brought on by the COVID-19 pandemic and increased use of virtual learning environments have influenced this institution's use of active learning strategies in virtual learning environments and ALCs can help clarify how active learning strategies and the use of active learning classrooms are evolving.

Going forward, this study is organized into four chapters.

- Chapter 2 is a literature review integral to understanding the historical, theoretical, and conceptual context of this study. This chapter will review scholarly literature on active learning, active learning strategies in higher education institutions, learning environments including specialized physical active learning classrooms and virtual spaces, faculty learning communities and their role in supporting the implementation and use of active teaching and learning strategies and demonstration of how to best use active learning classrooms, and emerging research on the impact of the COVID-19 pandemic on active learning.

- Chapter 3 covers the framework for the study design, with details about the methods and this researcher's personal connection to the work, including how the researcher maintained objectivity and ensured the validity of the study.

- Major findings from the inductive data analysis and the themes that emerged through the interviews with faculty will be presented in Chapter 4.

- Chapter 5 will summarize and discuss the findings of the research through the lens of the research questions, theoretical and conceptual frameworks, and literature reviewed. This chapter will conclude the study by identifying limitations and implications for the practice of active learning strategies in active learning classrooms in higher education and suggest research to further the study's impact. Findings may speak to active learning strategies in virtual learning environments as well.

CHAPTER 2: LITERATURE REVIEW

The purpose of this exploratory descriptive case study was to understand the experiences of faculty learning community (FLC) members practicing active learning strategies in virtual learning environments to discover how teaching in virtual spaces for an extended period of time impacted the use of active learning strategies in physical classrooms.

Scholarly research on the practice of active learning strategies and research on teaching outcomes in specialized active learning classrooms (ALCs) have become deeply intertwined in the literature (Cattaneo et al., 2017). Faculty learning communities (FLCs) promoting the practice of active learning strategies in ALCs have become common faculty development programs at higher educational institutions (Birdwell & Uttamchandani, 2019; Callens et al., 2019; Cook-Sather, 2011; Eby & Lukes, 2017; Elliot et al., 2016; Gibbs & Coffey, 2004; Levesque-Bristol et al., 2019, O'Meara, 2005, 2007).

The purpose of this literature review is to examine the intersection of learning spaces in higher education with the practice of active learning strategies and faculty development surrounding active learning in order to provide a basic context for exploring and describing the lived experiences of the faculty learning community members interviewed in this exploratory descriptive case study.

Learning Spaces in Higher Education

The transformation of learning spaces is steeped in history: traditional spaces for learning began with ancient Greek theaters (theater-style lecture halls), then transformed to separate lab spaces that supported science lectures, and most recently have developed into specialized classrooms that combine the benefits of all these types of spaces into one, active learning classrooms (Beichner, 2014). Early virtual classrooms took the form of distance education,

defined by the Office of Educational Research and Improvement–part of the U.S. Department of Education–as "the application of telecommunications and electronic devices which enable students and learners to receive instruction from some distant location" (Casey, 1989, p. 45).

While a basic understanding of the history of traditional classrooms and distance education programs in higher education is necessary, it was not the focus of this study. Rather they are key parts of the story, and context must be provided to inform the focus of the study on the use of active learning strategies in active learning classrooms, virtual learning environments, and all types of physical classrooms.

Traditional Classrooms and Distance Education Programs

Despite a great deal of progress in connectivity (the Internet, instantaneous access to information, integration of Web 2.0 technologies) on higher education campuses over the past 20 years, lecture halls and other forms of traditional classrooms are still in use (Beichner, 2014; Jamieson et al., 2000; Van Horne et al., 2012). Traditional classrooms can be defined as lecture halls, or similar classrooms with fixed seating that orients toward the front of the classroom, where students come to attend a lecture given by an expert in a discipline as means of learning a subject (Baepler et al., 2016, Beichner et al., 2007). The willingness of instructors to use active learning strategies has been found to be related to the size of the class, as larger, lecture-sized enrollments make it difficult to employ active learning strategies in traditional classrooms (Braxton et al., 2000). Hill and Epps (2010) found that when institutions upgraded traditional classrooms' seating, lighting, and computer access, student's satisfaction with the space and their instructors increased. However, their academic performance did not improve along with these changes in the physical learning environment alone.

Distance education has become mainstream in the United States due recent innovations in technology and software that make it easier and more affordable to use (Simonson et al., 2019). Yet learners face a conflicting pressure, they prefer to learn in-person in classrooms but demand the flexibility of being permitted to also learn from a distance. Distance education's focus has been on developing courses to deliver instruction to off-campus learners. Data from the 2006-2007 academic year indicated that 61% of higher education institutions in the US were offering online courses (Parsad & Lewis, 2008). In 2008, data indicated that 4.6 million students in US higher education institutions were taking at least one online course; that is over a quarter of the entire higher education population (Allen & Seaman, 2010). While distance education programs are popular due to flexibility, these same structures can lead to feelings of isolation, problems with time management and self-direction, and decreased motivation (Jeong et al., 2019).

Over the past few years, the demographic profile of online learners has changed to include not only those who could not join the "traditional" face-to-face college model, but to also include culturally diverse students of all ages, gender identities, abilities, and education levels, from all disciplines (Rizvi et al., 2019). In a large and comprehensive meta-analysis, Means et al. (2013) found that students in online learning environments performed modestly better than those in face-to-face learning environments. Significant performance improvements were found when comparing a blended approach of online and face-to-face learning environments against face-to-face instruction alone.

Studies on distance education increasingly find implementing active learning strategies in online course design provides learners opportunities to engage with content. These findings support that leveraging students' personal experiences and real-life examples with the course content deepens learning (Berge & Mrozowski, 2001; Lister, 2014; Sahin, 2017). Research-

based rubrics for distance education course design, primarily based on two main rubrics, the *Quality Matters Framework,* or California State University's, *Rubric for Online Instruction,* all require active learning strategies to be included to ensure quality programs that practice teaching methods that lead to student success (Baldwin et al, 2018; Kelly, 2019). However, the research covered between 2001 and 2018 also all noted that there was a lack of inquiry about the operational side of managing distance education programs; guidelines and policies on equity, accessibility, inclusion, and documented support for faculty development was found to be missing from the literature (Berge & Mrozowski, 2001; Martin et al., 2020; Tallent-Runnels et al., 2006). Active learning was found to be one of the top factors that increased student satisfaction and learning outcomes in distance education programs using Web 2.0 technologies and virtual learning environments that provided social engagement between faculty and students (Annasingh, 2019; Gedera, 2014; Jeong et al., 2019; Lister, 2014; Sahin, 2017; Wang et al., 2013). Despite the positive impact of active learning on distance education course design, some students are still not ready for completely independent work and need the physical presence and assistance of the instructor to be successful (Kireev et al., 2019).

While the majority of institutions of higher education have traditional classrooms and distance education programs, the COVID-19 global pandemic was the first time that most faculty members had taught in fully virtual learning environments for an extended time. The pandemic triggered extraordinary change in the organization of teaching and learning over a short period of time; particularly the emergency introduction to distance education for all faculty (Ozadowicz, 2020). However, the experience of practicing emergency remote teaching accomplished during the COVID-19 pandemic is not to be confused with planned and strategically constructed distance education programs and courses (Hodges et al., 2020; Inside Higher Education, 2022).

Active Learning Classrooms

The first question to ask when planning to construct a new learning space is: "What is it about the learning that must happen in this space that compels us to build a brick-and-mortar learning space, rather than rely on a virtual one?" (Bennett, 2007, p. 15). Some reasons to choose a physical space could have to do with the active learning methods being used; social engagement, immersive learning, collaborative learning, and performance-based techniques may be more effective in a physical space (Bennett, 2007). The definition of active learning classrooms (ALCs) and active learning practices are varied throughout the literature, contributing to complications reviewing the research on the two subjects when looking for comparisons. The physical active learning classroom and active learning teaching strategies practiced within them are inextricably linked throughout existing literature, making it difficult to isolate findings on the ALC space separate from active learning strategies (Cattaneo et al., 2017; Temple, 2008).

Beginning in the 1990s, an effort was made to combine the lecture portion of class with the lab experience, this became known as the "studio approach," and included redesigning the course experience to include a redesign of the facilities (Wilson, 1994; Wilson & Jennings, 2000). These early redesigns of the classroom space led to the creation of what is now known as the active learning classroom (ALC). Examples of these early ALCs include North Carolina State University's SCALE-UP (Student-Centered Activities for Large Enrollment University Physics) classrooms, University of Iowa's TILE (Transform, Interact, Learn, Engage) classrooms, Massachusetts Institute of Technology's TEAL (Technology Enabled Active Learning) classrooms, and the University of Minnesota's PAIR-up classrooms (Beichner et al., 2000; Breslow, 2010; Van Horne et al., 2012; Whiteside et al., 2010).

These specialized learning spaces first emerged in STEM departments, the first disciplines to embrace practicing active learning strategies in classrooms that were specially designed to support student and instructor engagement (Beichner, 2014). The most widely-used design for building ALCs is the SCALE-UP model. More than 200 institutions globally are associated with North Carolina State University's SCALE-UP website and share classroom designs, instructional materials, and research on teaching with active learning strategies in active learning classrooms (North Carolina State University, 2011). Hallmarks of SCALE-UP-style ALCs include table-pods for promoting small group interaction; connections to technology and infrastructure; and additional low-tech learning technologies such as movable and reconfigurable furniture, fixed and mobile white boards, and audio-visual equipment integrated throughout the room to promote the physical manifestation of social networking in a classroom (Beichner, 2014; Breslow, 2010; Van Horne et al., 2012; Whiteside et al., 2010).

As the success rates for students being taught in active learning classes continued to be reflected in the research, higher education institutions built more ALCs, of all sizes and types, to support active learning practice by faculty (Baepler et al., 2014; Beichner, 2014). Significant findings about the impact of ALCs on college campuses included:

- students in ALCs perform better than those in traditional classrooms,

- students in ALCs exceed personal grade expectations on standardized tests,

- when active learning strategies are used in conjunction with an ALC, student learning gains are higher than when lecture is used in the same space, and

- using the flipped classroom and blended learning models in an ALC can reduce the time needed for face-to-face classroom sessions (Baepler et al., 2014; Baepler et al.; 2016; Whiteside et al., 2010).

However, even when technology enriched ALCs are provided to faculty, many continue practicing outdated, teacher-centered methods–like lecturing–in these classrooms, defeating their purpose. For the reported successes of active learning strategies in ALCs to actuate at an institution, instructors must match pedagogical practice with the space (Beichner et al., 2007; Lasry et al., 2012; Lasry et al., 2014).

Research has made clear that students are more engaged and successful when instructors integrate hands-on activities into the course delivery; rigorous studies have resulted in a solid foundation of evidence that students in lectures did not learn as much as students who had interactive components included in their learning (Beichner et al. 2007; Brooks, 2010). Despite this evidence, instructors and institutions held tight to the traditional lecture model of teaching while acknowledging that interaction did improve student learning, and promoted a compromise, the use of the "enhanced lecture" (Beichner, 2014; Bonwell & Sutherland, 2016).

The success of ALCs is linked to the institution's ability to engage cross-campus, interdisciplinary partners in the planning, developing, and engagement of faculty in professional development focused on inquiry-driven, student centered, teaching and learning in these new spaces (Eby & Lukes, 2017). Long-term implementation and support by institutions is rare (Van Horne et al., 2012). Findings suggest that institutions should focus on scheduling instructors who are practicing active learning pedagogy in ALCs; this match of space and pedagogy is shown to lead to greater student success (Holec & Marynowski, 2020; Lasry et al., 2012; Lasry et al., 2014). ALCs are the venue for types of active learning strategies that are naturally difficult to replicate in the online environment, however virtual simulation is not an impossible task given the rapid innovations in technology (Baepler et al., 2016). In early 2020, higher education did not realize that popular ALCs were about to become empty rooms and the opportunity to explore

what could be done with active learning strategies in virtual learning environments was about to impose itself on faculty and administration.

Virtual Learning Environments

Learning environments in higher education tend to evoke the image of classrooms and physical spaces dedicated to face-to-face learning; the introduction of technology updates to face-to-face classrooms, and the opportunity to move learning into virtual spaces requires educators to reconsider what they think of when they imagine learning environments (Brown & Lippincott, 2003). The idea of virtual learning environments was first mentioned by Hitlz (1986) when posing questions about how virtual classrooms could be built for interactive engagement and learning within the framework of a computer system. Virtual learning environments (VLEs) can be synchronous or asynchronous, they can be spontaneous or rigorously planned, and students and instructors can be in multiple virtual learning environments at once (Brown & Lippincott, 2003).

Since the mid-2000s, educators at all levels had been developing online content for courses and were using online elements in face-to-face classes to encourage active learning (Kleinman, 2005; Wang et al., 2013). Astin (1993) found that the relationships built between students, their peers, and teachers is crucial to successful learning. As the business of learning is conducted virtually more frequently, and fully-online institutions emerge as viable options for students, face-to-face colleges and universities rightfully feel concerned, pressured even, to ensure that the types of relationships and interactions Astin (1993) cited are maintained both on the physical and virtual campus (Beichner, 2008, 2014). However, definitions of in-person active learning versus virtual active learning have not been distinguished; active learning strategies target physical classrooms, which may not seamlessly transition to virtual learning environments

and little research focuses on adapting approaches for ALCs to VLEs (Pilkington, 2018). Virtual learning environments were the clear option for higher education to ride the avalanche and maintain course delivery and instruction at campuses around the world during the COVID-19 pandemic. Online learning using digital web-based tools was already being used as a bridge to communicate and share resources between teachers and students (Singh & Thurman, 2019).

Active Learning

In active learning classrooms (ALCs), faculty are meant to practice active learning strategies. The following sections will cover the history of active learning, how it is defined and described in the academy, and why it is an important teaching practice for faculty today.

A Brief History of Active Learning

The first mention of active learning in theoretical literature occurred when Dewey (1916) used the word "active" forty times to describe people, places, and things related to the act of learning, which is defined as "something which the individual does" when they study, which is "an active, personally conducted affair" (Dewey, 1916, p. 335). Active learning is not a theory, rather it is a pedagogy or methodology, first written about extensively by Bonwell and Eison (1991) who were inspired by Dewey (1916). When instructors practice active learning, they facilitate their students moving from surface-level learning about "things" to deeper-level learning that taps into their prior knowledge (Bonwell & Eison, 1991).

Prior to Bonwell and Eison (1991), Chickering and Gamson (1987) reviewed fifty years of research on how educators teach, how students learn, how students work together, and how students interact with instructors. This research was distilled into best practices and highlighted in their widely-disseminated article, *Seven Principles for Good Practice in Undergraduate Education*. Number three on their list of best-practices was "uses active learning techniques,"

stating "students do not learn much just by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers" (p. 4). Higher education and scholarly research took note; a few years later, Chickering and Gamson revisited their 1987 article to focus on its impact and how many well-developed assessment and research instruments had been created using the seven principles as a rubric for what best teaching practice in higher education should look like (Chickering & Gamson, 1991). In the early nineties, higher education began to strongly encourage the use of active learning strategies throughout the curriculum and assess its use through evaluations based on the research of Chickering and Gamson.

In the same year that Chickering and Gamson (1991) revisited the article that had dramatically changed higher education benchmarks, Bonwell and Eison (1991) published a manual that would become the educator's playbook for practicing active learning; *Active Learning: Creating Excitement in the Classroom*. Bonwell and Eison covered everything from the definition of active learning, transitioning from lecture to active teaching practices, support for the classroom environment, strategies for promoting active learning, barriers to change in the classroom, and gaining the support of administration and leadership.

There is a diverse range–hundreds of strategies–of popular active learning strategies used in higher education active learning classrooms documented throughout the literature. Prince (2004), in reviewing the research on active learning, provided the following generally-accepted definitions highlighting the overarching vocabulary themes in active learning and created categories in which active learning strategies may fall. These four definitions can be found in Table 1.

Table 1

Prince (2004) Vocabulary of Active Learning

Vocabulary	Definition
Active Learning	"any instructional method that engages students in the learning process" and "active learning requires students to do meaningful learning activities and think about what they are doing."
Collaborative Learning	"any instructional method in which students work together in small groups toward a common goal."
Cooperative Learning	"a structured form of group work where students pursue common goals while being assessed individually."
Problem-Based Learning	"an instructional method where relevant problems are introduced at the beginning of the instruction cycle and used to provide the context and motivation for the learning that follows."

Note: All quotes taken from Prince, 2004, p. 223.

Definitions of Active Learning

A recurring issue that comes up when attempting to define active learning is that it lacks a clear definition, identifiable origin, or general agreement by educators and researchers on its meaning (Bonwell & Eison, 1991; Drew & Mackie, 2011). Cattaneo et al. (2017) found student-centered teaching to be the common goal of all active learning pedagogies; however, a "strong dissonance" exists between the "theoretical underpinnings" (p. 144) of the pedagogy and the reality of how it is practiced. The vague and hazy definitions of active learning can be leveraged by educators and policy makers as an opportunity to bridge the divide between theory and pedagogy and create new ways of learning. They can also be seen as problematic, as concepts that are meaningless, and appear to suggest that all other learning is passive and thus inferior (Drew & Mackie, 2011). Bonwell and Eison (1991) cited Dewey's explanation that it is something a student does personally and individually when actively studying, but then point out

that this is confusing because a student cannot be actively learning if they are doing so alone in what is perceived to be a passive fashion (Bonwell & Eison, 1991).

Ideal learning is collaborative and social, increases involvement, shares ideas and reactions, sharpens thinking, and leads to deep learning that is not achieved in an isolated learning space (Chickering & Gamson, 1987). Bonwell and Eison (1991) recognized there was no clear definition of active learning so they created a working definition for the purpose of their book; active learning is defined as "anything that involves students in doing things and thinking about the things they are doing" (p. 2). Prince (2004) defined active learning as "any instructional method that engages students in the learning process. In short, active learning requires students to do meaningful learning activities and think about what they are doing" (p. 223).

Bonwell and Sutherland (1996) developed a conceptual framework to guide instructors in purposefully implementing active learning methods regardless of the discipline, teaching style, or course objectives. The *continuum* focuses on taking students through a learning process where they move from inexperienced to experienced, focusing on acquisition of knowledge first and then acquisition of new skills and attitudes, beginning by using limited interaction in the classroom then moving to extensive interaction (Bonwell & Sutherland, 1996). Similar continuums exist in literature on active learning strategies where teachers and learners move from passive to active through a strategic process (Bonwell & Sutherland, 1996; Keith-Le et al., 2020; Lord et al., 2011, O'Neal & Peter-Grover, n.d.). An example of one such continuum is the *Richter Active Learning Continuum* (see Figure 3) which illustrates how faculty can transition from traditional lecture to full implementation of active learning strategies (Keith-Le et al., 2020).

Figure 3

Richter Active Learning Continuum
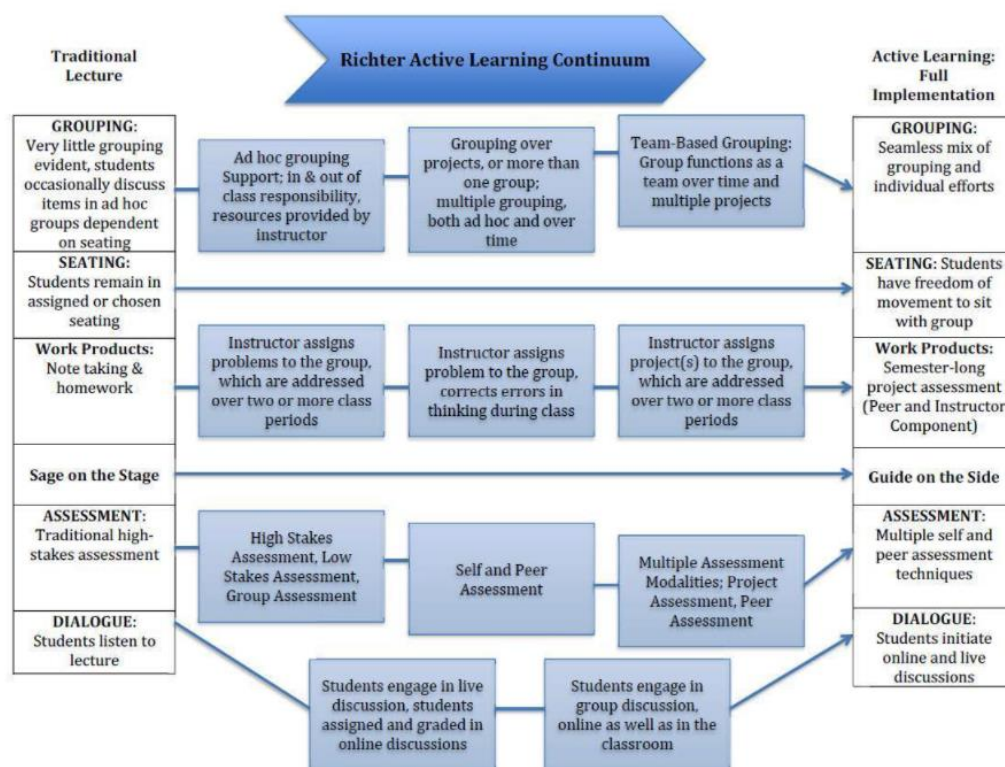
Note. The *Richter Active Learning Continuum* guides faculty from delivering traditional lectures to fully implementing active learning strategies (Keith-Le et al., 2020).

Definitions of active learning are similar in that the student is actively participating and reflecting on their participation. It is possible to understand what active learning is by defining what it is not; students sitting passively listening to a lecture that includes minimal interaction between the instructor and student or between students and other students.

Active Learning Improves Outcomes

Institutions of higher education have been clinging to traditional and outdated practices, such as delivering course content through lectures, that do not align with changes in

technological innovation, student expectations, and research showing that engaged learners experience deeper learning through active learning strategies that include rigorous reflection and discourse (Garrison, 2006; Garrison & Vaughan, 2008). University leaders and faculty are questioning what teaching and learning strategies are best now that research has made it clear that traditional lecture is obsolete and ineffective (Barber et al., 2013). Higher education policy across the globe is increasingly focused on engaging students through active learning strategies because it builds the skills and dispositions necessary to help students grow to become global citizens and flexible life-long learners who are able to thrive in an ever-changing economic landscape (Drew & Mackie, 2011).

Research finds that the students of instructors who practice active learning strategies attain better learning outcomes reflected in higher course grades (Braxton et al., 2000; Chickering & Gamson, 1987; Wilson et al., 2007). Specifically, problem-solving skills are heightened, conceptual understanding is enhanced, positive mindset increases, and failure rates are drastically reduced for all students–especially for women and minorities (Beichner et al. 2000, 2007; Beichner & Saul, 2003; Beichner, 2008, 2014; Kirby, 2020; Wilson et al., 2007). The students of faculty members who employ active learning strategies typically have higher overall GPAs, and active engagement in discussion has been directly linked to higher grades than for students who were less engaged (Wilson et al., 2007).

Braxton et al. (2000), in exploring how active learning strategies could suggest a revision to Tinto's (1997) "Model of Institutional Departure," found that use of active learning strategies was a predictable source of influence on student departure decisions and had a positive influence on student persistence. Both Tinto (1997) and Braxton et al. (2000) focused on the positive impact of cooperative learning, an active learning strategy that fulfills Tinto's (1997) need for

both social and academic systems that support student persistence. Freeman et al. (2014) conducted a study where the findings made one of the strongest cases for active learning yet; they completed a meta-analysis of 225 research studies that reported exam scores and failure rates in STEM courses based on the use of traditional lecture or active learning strategies. The findings were significant and showed that the students of faculty members practicing active learning strategies performed better on exams–by an average of half a letter grade–while faculty teaching students through traditional lectures had failure rates increased by 55%. Freeman et al.'s study was the largest and most comprehensive study to date that looked at data on student outcomes and the use of active learning strategies compared to traditional lecture; the findings raised serious questions about the future use of traditional lecture in teaching and learning.

Questions about why active learning is so successful have been raised in relation to how and why students pay attention in the classroom, a topic about which little is known (Keller et al., 2020). McLean et al. (2016) examined the success of the flipped classroom model of active learning practice, which had become very popular as blended and online modes of course delivery were accepted in traditional higher education classes. Faculty who leveraged the flipped classroom model had students who reported spending less time multitasking during lessons, were more comfortable asking their instructors questions about confusing materials, gained independent learning skills, and engaged in deeper learning as a result of the use of this active learning strategy (McLean et al., 2016; Keller et al., 2020).

Prince (2004) noted that faculty tend to view active learning in one of two ways: as an advocate, or as a skeptic viewing it as another educational fad. Seeking evidence to support the effectiveness of active learning, Prince (2004) approached active learning from the view of the skeptic and conducted an in-depth review of the research including supportive and contradictory

evidence in the most commonly cited existing literature. Prince ultimately found extensive empirical research that supported the use of a variety of active learning strategies and concluded that active learning does indeed "work." Significant results were shown by instructors incorporating active learning strategies into courses that were traditionally lecture-based and student attention span and engagement was found to increase. In the end, Prince found considerable support in favor of active learning strategies having a positive impact on student engagement when used in conjunction with lectures. Prince specifically highlighted problem-based learning (PBL), a form of active learning, as an approach that improved student attitudes, retention of knowledge, and stimulated deep learning in a way that traditional instruction did not. This key study resulted in findings that broadly supported the most common forms and elements of active learning strategy currently examined in educational literature.

More recently, evidence-based frameworks that support faculty in implementing active learning strategies in their courses have been developed. The 5E Instructional Model (shown in Figure 4) is a learning cycle with levels that build upon each other as faculty implement active learning strategies (Bybee et al., 2006).

Figure 4

5E Instructional Model

	Engage	Explore	Explain	Elaborate	Evaluate
Definition	Activate prior knowledge and experiences, address preconceptions, note current understanding of key concepts.	New information presented as a standard base, aim for understanding, organizing, and connecting concepts.	Teach-back (self-peers-instructor), identify and clarify misconceptions, dissect, question, analyze, discuss	Apply/transfer concepts in controlled real-world situations, allow for mistakes to deepen learning	Metacognition, feedback (receive and give), self-monitoring
Examples	● Question ● Idea ● Initial reactions ● Guess ● Current understanding ● Stories ● Course-related surveys	● Guided Questions ● Analogies ● Concept maps ● Frameworks/ organizers (templates) ● Discussion Forums ● Lecture (mini) ● Use Case	● What ● Why ● How come ● How do you know.. ● What made you sure? ● What evidence can you share? ● How does it work?	● What if..when.. ● How about if… ● What happens when ● What would you do…	● Self-assessment ● Rubrics ● Course-related surveys ● Concept maps ● Reflections ● Journals

Note. Bybee et al. (2006) created the 5E Instructional Model learning cycle framework to help instructors navigate incorporating different levels of active learning into their course design.

Another evidence-based framework that has helped faculty think differently about the use of active learning strategies and student engagement, beyond just on-task and off-task, is Chi and Wylie's (2014) interactive-constructive-active-passive (ICAP) framework, which categorizes student engagement behaviors and suggests some strategies are better for deeper learning than others. The hypothesis behind the ICAP framework can be found in Figure 5 and is the most recent example of how empirical research has expanded how active learning strategies are implemented in classrooms (American Educational Research Association, 2016; Chi, 2009; Chi & Wylie, 2014).

Figure 5

The ICAP Hypothesis

Four Modes of On-Task Engagement Behaviors			
Receiving	Manipulating	Creating	Collaborating
Passive	**Active**	**Constructive**	**Interactive**
Store	Activate	Activate	Activate
	Integrate	Integrate	Integrate
		Infer	Infer
			+ Partner/ Co-Creation

← Shallow Learning   Deep Learning →

Note. The ICAP hypothesis supports that Interactive > Collaborative > Active > Passive and interactive strategies produce deeper learning outcomes (American Educational Research Association, 2016).

Frameworks like the 5E Instructional Model (Bybee et al., 2006) and the ICAP Framework (Chi, 2009; Chi & Wylie, 2014) have helped faculty practicing active learning strategies in higher education classrooms become the rule rather than the exception.

Active Learning in the Time of COVID-19

The model most used by faculty to actively engage students in virtual learning environments during the COVID-19 pandemic was one that strived to retain the original course learning objectives delivered through communal online cloud-based technologies. The model incorporated condensing course content for online consumption, creating opportunities for collaboration through breakout rooms and other web conferencing tools, and leveraging online polling software to maintain real-time student participation (Thibaut & Schroeder, 2020; Christianson, 2020).The instructor served as the facilitator for these teaching strategies by joining breakout rooms, answering questions, clarifying directions, and monitoring chats and emails (Thibaut & Schroeder, 2020).

Instructors who chose a purely asynchronous approach to the COVID-19 pandemic found they needed to supplement with optional synchronous sessions to provide flexibility and support for the vastly different experiences of displaced students (Christianson, 2020; Guo, 2020). However, in most cases, faculty found that students did not attend or did not engage with the synchronous sessions (a 30%-to-50% reduction from face-to-face classes) (Christianson, 2020). Students able to attend the synchronous sessions inadvertently experienced the online version of the popular active learning method, the flipped classroom, with asynchronous content delivered

one day and synchronous engagement amongst the class occurring another day (Guo, 2020). Analysis of emerging and limited data showed that all students saw a reduction in their overall grade, but students who attended the optional synchronous sessions saw a smaller reduction overall, a smaller drop in exam scores, and reported spending less time on coursework (Guo, 2020).

During the time in emergency online teaching, Kirby (2000) found faculty desperate to find ways for students to share with each other verbally or work in groups, but they did not necessarily consider the situation the pandemic may have put previously disadvantaged students into. Students who were introverted or who have disabilities, different cultural norms, or different learning styles, were disadvantaged even more by the move to fully online learning environments during the pandemic. Adding the complex layer of learning and manipulating new technologies with navigating daily changing unknowns contributed to unintended complications, confusion, and feelings of isolation for some students. Conversely, students with disabilities received additional and unique support during the ongoing emergency through the exploration and use of online platforms being tried for the first time to continue education; educators developed creative and innovative ways to overcome the limitations of the virtual learning environment that provided new opportunities for teaching and learning experiences that broke the boundaries of the normal classroom setting (Pokhrel & Chhetri, 2021).

Moorhouse (2020) found instructors used a combination of synchronous and asynchronous modes of delivery, employing the flipped classroom virtually, with asynchronous portions covering readings, course materials, and slide or slide-and-voice-over presentations group activities converted to individual activities; and instructor support provided on demand. Synchronous sessions were initially optional and were unorganized open discussions about the

content; however, instructors found they had to require synchronous sessions when it was noted that attendance and student participation declined. After switching to required sessions, instructors implemented a more structured course design, using breakout rooms and discussion prompts based on the materials covered in the asynchronous part of class. Smaller-scale discussions in the breakout rooms led to large group discussions including the entire class and provided an opportunity for questions and feedback. These sessions were recorded and made available through the LMS for students who needed flexibility. Moorhouse found that this blended, flipped model increased attendance, improved student engagement and participation, and held encouraging implications for future virtual course delivery, but noted that further data is necessary to measure its success.

As countries around the globe faced COVID-19 lockdowns and educators were forced to pivot from face-to-face to online overnight (Tan et al., 2020), an accelerated paradigm shift from passive learning to active learning presented opportunities for higher education to transform teaching and learning in a way that does not require a physical campus (Nepal & Rogerson, 2020). The hasty adoption of pandemic-triggered emergency remote teaching brought with it a rapid introduction to a multitude of learning technologies that led to new and creative solutions for faculty to engage students through digital tools. Instructors were adapting to the new normal, using new software, digital content, alternative assessments, engagement technologies, and tools to practice active learning strategies were cautiously embraced by higher education (Ozadowicz, 2020; Tan et al., 2020). However, institutional leadership remained focused on maintaining (and returning to) the traditional on-campus student experience and traditional modes of student engagement, hindering a larger-scale movement furthering the normalization of virtual learning environment experiences (Nepal & Rogerson, 2020).

Active learning strategy espouses disruption as a way to accelerate growth and change; the COVID-19 pandemic has acted as a disruptor in higher education, presenting a rare opportunity to boldly redefine colleges and universities and reimagine teaching and learning practices (Tan et al., 2020). Bonk (2020) called for lessons learned from teaching through the COVID-19 pandemic to be used by educational researchers and higher education administrators to transform the "brave new world of teaching and learning" (p. 596) by allocating more resources to non-traditional strategies of teaching and learning.

Hasnine et al. (2020) created a model from their findings on institutions in Asia, Europe, and the United States and how they connected active learning strategies with technologies as seen in Figure 6. This is the first model to be published of its kind.

Figure 6

Hasnine et al.'s (2020) Active Learning (Connecting Strategies with Technologies)
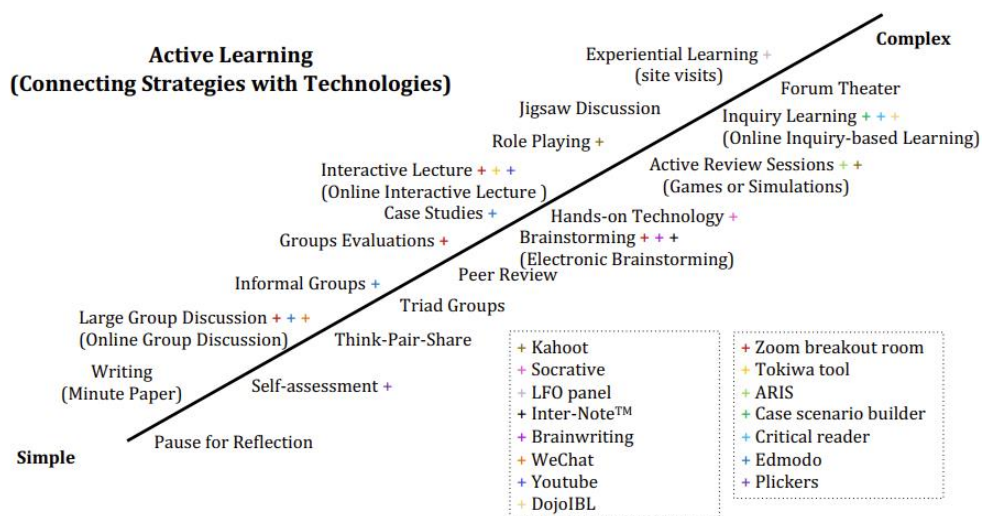
Note. Hasnine et al.'s (2020) model connecting active learning strategies with digital technologies used during the time in VLEs and for use in a post-pandemic future.

The pandemic created the perfect environment for alternative learning environments to be

showcased, but it is yet to be seen if this revolution (or evolution) will drive the future of faculty teaching practices (Ozadowicz, 2020).

Faculty Development

Chickering and Gamson (1987) asked "Whose responsibility is it?" (p. 5) in reference to improving higher education teaching and learning practices. Among their recommendations were provision of adequate resources and support for faculty professional development and placing a value on participation in development that results in an impact on hiring and promotion practices across institutions. Braxton et al. (2000) recommended that those responsible for faculty professional development activities at colleges and universities should develop workshops, seminars, and discussion forums to help faculty members acquire the knowledge, skills, and abilities that are necessary to successfully incorporate active learning strategies in the classes they teach.

Gibbs and Coffey (2004) conducted an international study examining the effectiveness of professional development for university instructors across 22 universities and eight countries. Two groups of instructors were examined; one group received training, the other did not, and at the end of a year they were assessed and compared based on several standardized assessment tools, self-report, and student evaluations. Findings included that the group of instructors who received training took a student-focused approach in their teaching methods resulting in higher student engagement and deeper learning; instructors who did not receive training moved away from a student-focused approach and comparable positive changes were not noted in the data analysis. Centers for teaching and learning have traditionally provided faculty a varied selection of professional development opportunities–informal and formal, deliberative and reactive–that include training, consultations, and faculty learning communities (Smith, 2019).

Faculty Learning Communities

The faculty learning community (FLC) began to be used in higher education for professional development in the mid-1990s, but the concept was not new and was a natural extension of the teaching fellow programs that had emerged in the mid-1970s (Cox, 2001). A type of community of practice (CoP), an FLC is defined as a "cross-disciplinary faculty group of 8–14 members engaged in a year-long program with a curriculum about enhancing teaching and learning with frequent seminars and activities that provide learning, development, and community building" (p. 71). In later definitions, Cox (2013) added that FLCs are voluntary and focus on engaging in Scholarship of Teaching and Learning (SoTL) projects. Cox (1999) categorized FLCs into two groups: cohort-focused, intended for developing faculty in general, or issue-focused, where the faculty focus on development around a specific issue. Unlike other faculty groups, FLCs are intensive and organized in a way that promotes faculty engagement in the continuous process of learning and reflection about teaching (Cox, 2002). The need for faculty development programs identified in the 1970s led to the Lilly Endowment's Teaching Fellows Program emerging as the leading model, beginning in 1974, at most major universities in the United States (Austin, 1992). O'Meara (2005, 2007) attributed the Lilly Endowment as being the first example of the modern-day FLC. Another example, the Miami Teaching Scholars program, was established in 1978 and won the Hesburgh Award in 1994; this award is given to a faculty development program which is judged to significantly impact undergraduate student outcomes (Cox, 1995; 2003).

Findings show the use of FLCs to be successful because they leveraged community members as resources and their collective knowledge served as the program's biggest asset (Sirum et al., 2009). Participation in an FLC empowered members to experiment in a safe space,

where they could share ideas and challenges with colleagues while not being under pressure to deliver instant successful results. Participation in the FLC itself is recognized as a positive indicator that the member cares about developing new teaching and learning skills (Sirum et al., 2009). Cox (2016) identified FLCs as one of the most important collaborative structures in higher education, and yet research finds leadership does not appear to pay much attention to them. Austin (1992) pointed out that leadership has traditionally viewed engagement in scholarship narrowly, as research productivity, rather than engagement with professional development or service to the university. This narrow perspective is changing at institutions, and there is a focus on encouraging and expecting that faculty will engage with both going forward.

Active Learning Faculty Learning Communities

Faculty new to practicing active learning methods and new to the technology in active learning classrooms require training and professional development. Universities have responded to these needs with faculty learning communities focused on student-centered teaching in student-centered spaces (Birdwell & Uttamchandani, 2019; Callens et al., 2019; Cook-Sather, 2011; Eby & Lukes, 2017; Elliot et al., 2016; Levesque-Bristol et al., 2019; O'Meara, 2005, 2007).

O'Meara (2005) conducted a key mixed-methods study to determine if a cross-institutional and multi-disciplinary faculty learning community, centered on the goal of increasing the use of active learning strategies, was successful. Findings from the data showed three themes emerged: the impact of the program on teaching careers, the impact of the program on participants' understanding of how students learn, and the impact of the program on participants' understanding and use of assessment. The program was successful in meeting its goal; participants increased their understanding of student learning, used effective assessment

methods, developed professionally, and acquired the knowledge and skills to begin using active learning strategies.

O'Meara (2007) conducted a second key mixed-methods study to assess the impact of a cross-institutional FLC on STEM faculty fellows' knowledge and use of active learning strategies and course design. The FLC followed the same model as the one O'Meara studied in 2005; faculty met bi-weekly for dinner seminars and worked collaboratively on a course redesign project (O'Meara, 2007). Data collection and analysis was also conducted similarly, using three surveys (a before, mid-point, and after), observations of the dinner seminars, interviews with participants, and focus groups with participants. Findings from the data showed positive impacts on participants' familiarity with and use of active learning strategies, and on course redesign. The incentives encouraging faculty to participate and engage with the FLC in O'Meara's (2007) study are noteworthy; they were offered stipends, dinners, and support to ensure their success. This model is recommended by O'Meara (2007) as a way of using FLCs to strengthen teaching and learning practices in higher education. Institutions are building active learning classrooms, adopting new technologies, and encouraging faculty to practice active learning; these major changes to teaching and learning practices have been the ideal circumstances to develop FLCs.

Faculty development delivered through FLCs that use individual consultations, practice in classrooms, workshops, and online resources have been found to be successful in promoting the use of active learning strategies in active learning classrooms (Birdwell & Uttamchandani, 2019). Explanations of how active learning strategy works and leads to deeper learning and success is not just for faculty members, but for students too; everyone in the classroom can benefit from understanding how the opportunity to engage in active learning is beneficial (Cook-Sather, 2011).

Cook-Sather (2011) described a professional learning program for faculty at Bryn Mawr College called the Teaching and Learning Institute (TLI) that focused on five evidence-based pedagogical practices that promote active learning strategies for students and faculty:

- reflection on practice,

- development of meta-cognitive awareness,

- modeling and explaining,

- engagement in pedagogical transparency, and

- encouragement of students to practice reflection and dialogue.

Cook-Sather recommended that faculty carefully consider what, when, how, and why prior to implementing active learning strategies; this can help keep their learning objectives, their students, and the nature of the class in alignment.

Elliot et al. (2016) described how Iowa State University (ISU) presented an FLC as the solution to challenges presented when incorporating active learning strategies in large-enrollment introductory courses. Starting with a large-enrollment biology course, they worked to transform the course design from lecture-based to active learning using an FLC. The FLC created a space for instructors to collaborate on new teaching strategies, adapt course materials to incorporate active learning strategies, work through challenges, share progress, critique and revise strategies, and share resources among the instructors transforming their courses. Participants were surveyed and the findings indicated that the FLC was helpful in supporting the implementation of active learning strategies in courses, that participants in the FLC found value in the sharing of resources, and that participants in the FLC were interested in the student learning gains they observed and wanted to continue using active learning strategies in their classes. The ISU model leveraged instructors and an FLC to enact course reform, and the university has created iterative

versions of the FLC to assist other disciplines in making similar transformations to using active learning strategies. The ISU model of FLC deployment is unique and has transformed to include pairing of ALC designs with faculty development support; the TILE Institute Seminar is an FLC that is required for any faculty members that will be teaching in new ALCs (Baepler et al., 2016). The goal of this mandatory FLC was to connect the construction of the new ALCs with course registration, opening the spaces to disciplines across the campus community.

Eby and Lukes (2017) examined the need for institutional leadership to recognize FLCs and their associated activities to encourage more faculty to engage with them. Support for FLC workshops, resource sharing, strategic course scheduling, and the opportunity for live practice sessions where instructors get to engage with the ALCs are all elements of George Mason University's FLC on active learning strategies. Leadership at GMU collaborates with the provost's office and the campus planning and facilities office to design and construct flexible and varied ALC styles. Four recommendations from their experiences are:

- the importance of training faculty to teach in ALCs through a FLC,

- leveraging the FLC to share online and crowdsourced resources with faculty so they can obtain ideas from other practitioners of active learning strategies,

- ensuring that faculty members are scheduled for multiple semesters to teach in an ALC so they have time to experiment and see what works, and

- the importance of a commitment to institutional and departmental recognition for instructors engaging in these programs and innovative teaching practices.

Eby and Lukes (2017) reinforced the reality that engaging in new teaching strategies and changing your course design comes with risks. Student success rates may initially drop as experimentation occurs; lower evaluation scores can come with trying something new; and all

these risks come with implications for annual reviews, reappointments, and promotion and tenure. Eby and Lukes suggested leadership should show support for the risks taken to implement innovation with a letter to a faculty member's department explaining how the important work they are engaging in is contributing to future student success by promoting inquiry-driven, student-centered, teaching practices.

Levesque-Bristol et al. (2019) described Purdue West Lafayette's FLC, IMPACT, which has been offered annually since 2011, with over 321 faculty participants. The goal of the IMPACT FLC is to support student-centered learning environments and promote best practices in teaching and learning–including active learning strategies. Data collected on the IMPACT FLC was gathered from faculty interviews and focus groups; findings show that faculty members value the IMPACT FLC and agreed that it has a positive impact on their teaching practices and student outcomes.

Callens et al. (2019) examined the results of North Dakota State University's Gateways-ND FLC, which is a five-year National Science Foundation-funded program focused on transitioning instructors away from traditional lecture-based instruction toward active learning-based instructional strategies. Using the Gateways-ND FLC, the institution targeted instructors teaching entry-level "gateway" courses with high DWF rates (meaning students received a grade of D, F, W, or I). Within the first year of participation in the FLC, DWF rates markedly decreased in various disciplines, including history, biology, psychology, and chemistry; student retention levels also rose. The FLC reported additional positive changes in instructor teaching and improved attitudes toward learning from students.

Birdwell and Uttamchandani (2019) described Indiana University's Mosaic Fellows Program, which is essentially a constantly-evolving FLC. Similar to the communities described

by Eby and Lukes (2017) and Elliot et al. (2016), the FLC was created to support faculty active

teaching and learning strategies in newly created ALCs (Birdwell & Uttamchandani, 2019). Four

design principles guide the FLC's mission:

- fellows are provided an opportunity to explore teaching in a variety of classroom

  layouts,

- fellows personal teaching interests and goals are supported,

- fellows are provided space to collaborate with other fellows and share their learning

  experiences, and

- fellows' experiences are shared with university leadership and their departments to

  promote the work of the FLC.

Feedback collected from fellows indicated that they valued the opportunity to reflect deeply on

how their teaching approaches and learning goals will look different based on what type of

learning space they are teaching in (Birdwell & Uttamchandani, 2019).

UNC Charlotte's Active Learning Academy (ALA) faculty learning community (FLC) is

similar to other FLCs that support the use of active learning strategies in ALCs. During the

COVID-19 pandemic, the ALA continued to meet in virtual learning environments and faculty

supported each other as they persisted in delivering their courses. Exploring and describing UNC

Charlotte's FLC members' lived experiences practicing active learning strategies before, during,

and after the time spent in entirely virtual learning environments may aid in understanding

emerging trends in how active learning strategies are being used in physical active learning

classrooms beyond the existing faculty development surrounding active learning.

Many universities across the United States support faculty professional development

using FLCs. The FLC is one of the most frequently used developmental tools that universities

leverage to promote the spread of active teaching and learning strategies by faculty and to assist faculty in learning to teach in newly-constructed ALCs. Faculty who participate in FLCs support each other with teaching strategies and resources, peer collaborations, and evaluative support. They provide a unifying initiative that leadership can use to rally new faculty recruits. In these communities, experimentation and exploration of new and innovative teaching strategies are implemented over time.

Summary

Years of empirical research have validated the use of active teaching and learning strategies. Using the findings to guide practice leads to deeper learning and positive educational outcomes. Research on active learning practices, and similar research on teaching in active learning classrooms, are intertwined in the scholarly literature. Despite the breadth of studies on these topics, active learning and active learning classrooms are not defined well and definitions of active learning in-person and online have not been clearly developed. Active learning strategies are typically designed with the physical classroom in mind and often do not have planned translations for use in virtual learning environments. This presented a gap in knowledge and practice when faculty moved to emergency remote online teaching for an extended period during the COVID-19 pandemic. Professional development for faculty engaging in active teaching and learning practices and the use of active learning classrooms commonly take the form of faculty learning communities in higher education. Faculty engaged in learning communities committed to practicing active learning strategies in physical active learning classrooms are best situated to have a unique perspective on the abrupt move to, and extended time spent in, virtual learning environments. They can describe how active learning strategies

were impacted in the time spent online, and their experiences may reveal emerging trends as campuses have moved back to physical in-person courses.

CHAPTER 3: METHODS

The purpose of this exploratory descriptive case study was to understand the experiences of faculty learning community (FLC) members practicing active learning strategies in virtual learning environments to discover how teaching in virtual spaces for an extended period of time impacted the use of active learning strategies in physical classrooms. Faculty interviewed in this study experienced an abrupt and forced transition from active learning classrooms (ALCs) to fully virtual learning environments (VLEs) in March 2020 and continued teaching virtually until August 2021. The impact of the extended time delivering courses in virtual learning environments on active learning practice in physical classrooms was unknown. The researcher in this study explored and describes how faculty used active learning strategies in virtual learning environments and subsequently in the physical active learning classrooms when classes resumed in person at full capacity.

Overview and Research Questions

This chapter outlines the methodological framework and practices used to address the research questions that guided the study:

1. How did faculty learning community members practice active learning strategies in virtual learning environments?

2. How did the experience of practicing active learning strategies in virtual learning environments for an extended period of time influence how active learning strategies are practiced in physical classrooms?

Methodology

The dynamic and interactive nature of qualitative methodology is best suited to examining the impact of a specific event on a group of individuals with the goal of understanding

their shared experiences (Ravitch & Carl, 2016). In the constructivist tradition, qualitative

investigation allows the participants to construct reality and shared understanding from their

specific viewpoints within the context of social and historical circumstances (Creswell &

Creswell, 2018, Mertens, 2015, Yin, 2018). In addition, qualitative inquiry is appropriate for

exploring the experiences of individuals and groups facing a problem (Creswell & Creswell,

2018). Stake (2010) explained that qualitative research relies on human perception and

understanding that comes from examining personal experiences and intuition to understand how

"things work" in particular situations. Qualitative research carefully delineates a relationship

between the researcher and the participants, with particular attention given to maintaining trust

through a thoughtful research process (Ravitch & Carl, 2016). Traditional qualitative research

criteria work to minimize bias and support the validity of the data through rigorous processes,

use of triangulation, reliability of coding analysis, connecting data findings to external validity,

and contributing to theory (Patton, 2002). The specific methodology used in this study was

intrinsic case study (Crowe et al., 2011, Stake, 1995).

Case Study Methodology

Case study methodology is used to investigate contemporary phenomena situated in a

real-world context and seeks to answer questions about "how" and "why" using a research

design that leverages data triangulation to draw out meaning and reach generalized conclusions

(Yin, 2014, 2018). The most common theme among case study researchers is the notion that a

case study is an in-depth exploration of a system with definable boundaries (Creswell, 2006,

2013; Merriam, 1998; Miles & Huberman, 1994; Stake, 2010; Yin, 2018). Common

misunderstandings about case study research suggest that theoretical knowledge is superior to

practical knowledge and that generalizations that lead to theory cannot be the product of a single

case (Flyvbjerg, 2006). Different researchers take different approaches to case study. Intrinsic case studies are one approach that typically investigates unique phenomena (Crowe et al., 2011).

Qualitative intrinsic case study was used as this study focused on a contemporary phenomenon triggered by events that the researcher and the participants had little to no control over (Yin, 2014). Based on the novel events the study participants experienced, qualitative case study was appropriate to examine the uniqueness and complexity of the case framed by the researcher, who determined what to ultimately include and how the story would be told (Patton, 2002, Stake, 1995, Yin, 2014). In this unique intrinsic case study, the research methodology was used to search for commonalities between participant experiences to create meaning (Stake, 1995).

Case study was also chosen for this study because the research questions focus on a specific time- and place-bound situation with the goal of obtaining a complete and detail-rich, picture of what occurred from the perspective of the study participants (Jones et al., 2014; Yin, 2014, 2018). Yin (2003) suggested using a case study method "because you deliberately wanted to cover contextual conditions - believing that they might be highly pertinent to your phenomenon of study" (p. 13). This study does this through exploring the contextual experiences of faculty teaching throughout an extended time in virtual learning environments due to the COVID-19 pandemic.

Exploratory Descriptive Case Study

An exploratory and descriptive intrinsic case study design was used in the context of faculty teaching in VLEs throughout the COVID-19 pandemic to better understand the use of active learning strategies in learning spaces. Intrinsic case study was a good match for both exploratory and descriptive case study designs due to the unique phenomenon of participants

having the technological capabilities to continue to teach higher education courses in VLEs for an extended period of time due to a global pandemic for the first time in history.

As a researcher, Yin (2018) linked theory and practice in the use of case study. Exploratory case study was used because there were no stated study propositions, but there was a clear purpose for exploration of the subject (Yin, 2014). Descriptive case study was used because the purpose was to describe the phenomenon of the case in its real-world context. The case represented the singular experiences of a small group of instructors at a single institution of higher education, who were practicing active learning strategies in learning spaces that had been designed for their use, under organizational conditions dictated by their institution during a once-in-a-lifetime global emergency. Exploratory and descriptive case studies support linear-analytic, comparative, and chronological compositional structures, and exploratory case studies support theory building (Yin, 2014). The nature of the case following a timeline of events, and the comparison of the experiences of the participants to uncover emerging findings, made exploratory descriptive case study a good structural fit for the methodology. The "what" and "how" format of research questions, within the context of the case study, thus lent themselves to both exploratory and descriptive research (Yin, 2014, 2018).

The specific research questions framing this study were exploratory in nature because there was no prior information available about teaching virtually during a pandemic. Research was only beginning to emerge as this study was being conducted. The desire to understand the big picture and to explore an idea with the possibility of making new discoveries led to an exploratory research design for this study (Stebbins, 2001). The resulting findings from this case study are descriptive since they present a rarely-encountered situation that has not been accessible to researchers in the past (Yin, 2014).

Role of the Researcher

In qualitative research, the role of the researcher is focused on adhering to ethical practices, inclusion, authenticity, and the development of rapport and trust between the researcher and researched (Mertens, 2015). The researcher conducts all aspects of the study, including design, participant selection, data collection, transcription, analysis, and delivery. Because the researcher is so intimately involved in the study, their beliefs, values, biases, and judgements must be clearly stated and observed throughout the process so as not to markedly reduce the trustworthiness of the findings (Creswell, 1994). The case study approach uses narrative to capture and analyze the experiences of the people being studied, and the role of the researcher is to represent their stories in a valid, reliable, and trustworthy manner (Merriam, & Tisdell, 2016). Including this researcher's story, motivation, and reasons for choosing to conduct this study, the rationale behind this study design provides transparency and clear processes that this researcher followed to ensure the credibility of the study and findings.

Researcher Subjectivity

This study was born out of my work coordinating an FLC focused on practicing active learning strategies in specialized ALCs. My interest in promoting active learning, and my role, placed me in a key position of power to have knowledge of the faculty who were keenly dedicated to the FLC and to the practice of active learning strategies in ALCs. I observed FLC members' experiences navigating the phenomena of losing access to their specialized physical learning environments due to the COVID-19 pandemic and moving to VLEs. As a scholar and practitioner of teaching and learning, employed in academia, I found myself in the position to modify the FLC to support an online-only environment, while also giving virtual space to the participants for them to share the challenges they faced teaching in VLEs and the solutions they

were implementing to try to continue actively engaging their students. As the time our institution spent teaching in virtual learning environments grew longer, I began to wonder what effect the teaching modifications and new strategies faculty were employing would have when they were able to return to physical spaces. Seventeen months later, the institution in this case study returned faculty and students to in-person classrooms at full capacity, providing a unique opportunity to study any changes to active teaching and learning strategies that may have occurred.

In full disclosure of this researcher's beliefs, values, biases, and judgements, it is my belief that the extended period of time spent in VLEs, combined with the overwhelming exposure to online digital tools, would inherently change teaching and learning pedagogy going forward. I specifically thought this would be true for practitioners of active learning, who I view as being more open to experimentation with new teaching and learning strategies. Because of these pre-existing biases, it was important to me to follow a structured format for data collection and use multiple methods of triangulation to ensure trustworthiness in this study's findings.

Researcher Positionality

I am perceived as a middle-aged, cisgender, European American, able-bodied, woman. I have over 20 years of experience working in education, both in the private and public sectors. I have a total of 12 years of service working in public higher education institutions after completion of a terminal master's degree program. I have served as a faculty member, a staff member, and an administrator in higher education. The last nine years of my career have been at the institution where I conducted this exploratory descriptive case study, the University of North Carolina Charlotte (UNC Charlotte). Over four of those years have been spent working with the

institution's Center for Teaching and Learning; first as an instructional designer and technology specialist, and then in my current role as a faculty development specialist.

Since joining the Center for Teaching and Learning at UNC Charlotte, I have served as the program manager for a faculty learning community called the Active Learning Academy (ALA). I have worked to coordinate the annual cohorts, modify the programming to meet new demands, and strengthen program collaborations by focusing on active learning strategies that align with the work of the Learning Spaces Team who builds new active learning classrooms (ALCs.) The FLC trains faculty on active learning teaching strategies that can be used in ALCs. I have been involved in the planning and design of new ALCs in partnership with the Learning Spaces Team. I am the co-editor, and a contributing author, of a book published with FLC members on faculty experiences practicing active learning at the case study institution. I am the author of a grant that successfully awarded the institution with a new ALC from a well-known vendor of learning environment furnishings and technologies. In conjunction with this grant, I am the primary investigator in an ongoing research study at the case study institution examining the effect of the classroom environment on student mindset. During the move to virtual learning environments because of the COVID-19 pandemic, I changed the delivery of the ALA to be completely virtual and to focus on supporting faculty in the community in their efforts to implement active learning strategies despite the loss of their physical ALCs.

My position as a researcher in this study is that of an insider. I maintain a trusted relationship with the faculty who were interviewed and the leaders who approved the release of any data I needed for this study. I intentionally aligned this dissertation research with my current employment responsibilities and research interests to deepen my understanding of faculty experiences with learning communities, active learning strategies, and ALCs. I am deeply

curious about the lived experiences of the FLC members as they transitioned to virtual learning environments and then back to the physical ALCs. To protect this study's trustworthiness, my dissertation committee does not include anyone tied to my employment who could have influenced the way I conducted my research. My desire as a researcher was to be able to identify and report on any changes to the practice of active learning strategies in ALCs as higher education emerges from the impact of the COVID-19 pandemic. My insider role had advantages, including the power of access, and disadvantages, including the need to ensure that my positionality does not create a power imbalance and negatively impact the validity of my study or the ability for the faculty interviewed to speak openly and honestly about their experiences. I clearly disclosed that participation in this study was entirely voluntary, and that the decision not to participate would not impact faculty members' standing with UNC Charlotte, the Center for Teaching and Learning, the Active Learning Academy faculty learning community, or their access to schedule their courses in active learning classrooms.

<center>**Research Site and Participants**</center>

The University of North Carolina Charlotte (UNC Charlotte) is a large metropolitan public university in the Southeastern United States and the site of this exploratory descriptive case study. UNC Charlotte is the second largest public university in North Carolina and part of the UNC System, enrolling over 30,000 students (UNC Charlotte, n.d.a.). The institution employs 1,160 faculty members, with 85% of full-time faculty holding terminal degrees in their disciplines (UNC Charlotte, n.d.a.). This institution was purposefully chosen for this case study because of its commitment to promoting the use of active learning practices among faculty and its commitment to constructing (and upfitting) new active learning classrooms (Keith-Le et al.,

2020). UNC Charlotte posed a unique case with which to explore the research questions and was easily accessible to the researcher.

UNC Charlotte Response to COVID-19

UNC Charlotte was also chosen for this case study because of the extended period of time that it moved nearly all courses fully online during the COVID-19 pandemic. The university's response is publicly documented and archived by date on a webpage called NinerNotices (UNC Charlotte, n.d.f.). The university's response to COVID-19 began before spring break with the decision to cancel study abroad programs to China, South Korea, Japan, and Northern Italy and to recall all students studying abroad. In examining this timeline, the following dates and events stand out in relation to the institution's response that impacted the physical campus and the ability of faculty to teach face-to-face in ALCs.

- On March 10, 2020, North Carolina's Governor declared a state of emergency and local news stations reported that some classes at UNC Charlotte had been moved online but there had been no official announcement yet.

- On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic, and on March 12, UNC Charlotte's Chancellor notified the campus community they were preparing to move fully online if necessary.

- On March 16, based on guidance from the University of North Carolina System Office, UNC Charlotte moved the majority of courses fully online. A small number of lab courses that were required to meet in person due to licensure requirements remained on campus, leveraging large classrooms, physical distancing, masking, and increased sanitizing measures to continue meeting with precautions.

- The majority of courses remained in virtual learning environments until August 23, 2021, when the campus fully opened back up at full capacity with pre-March 2020-level face-to-face course delivery.

Active Learning Academy

This study gathered data from participants of a large faculty learning community (FLC) focused on using active learning strategies in active learning classrooms (ALCs) at UNC Charlotte. The name of the FLC is the Active Learning Academy (ALA). The ALA has been admitting annual cohorts since 2014 and during this time there have been a total of 278 members, with 59% of members joining multiple cohorts (UNC Charlotte, n.d.b.). The ALA is open to all faculty, instructional staff, and graduate students interested in practicing active learning strategies and, to date, there has been participation from all colleges and schools across the university (UNC Charlotte, n.d.b.) At the time of publication of this study, there had been eight total cohorts of the ALA at UNC Charlotte.

The ALA groups members into teams, then teams are led through activities, research on active learning strategies, and ALC use by the Center for Teaching and Learning and a peer facilitator who receives a stipend for their service (UNC Charlotte, n.d.c.). Each academic year the ALA focuses on learning about the latest in active learning strategies while also focusing on a relevant theme that is current in teaching and learning practice and research. During the 2021-2022 academic year cohort, the ALA focused on the theme of *"Reimagining teaching & learning - Building on the remote learning experience"* and developed and delivered virtual workshops on the topic for the campus at-large as well as brought in guest speakers and hosted an annual "Spring Expo" that provided ALA members an opportunity to disseminate their research and scholarly knowledge (UNC Charlotte, n.d.c.).

Members of the ALA have been responsible for a large body of research, publications, symposia, and conference presentations on active learning teaching strategies and ALCs (UNC Charlotte, n.d.d.). For example, 24 faculty members and administrators who are, or were, members of the ALA wrote a book about practicing active learning strategies that was published in 2020, *Faculty Experiences in Active Learning: A Collection of Strategies for Implementing Active Learning Across Disciplines*, of which this researcher is an editor and contributing author (UNC Charlotte, n.d.e.).

For all these reasons, members of the ALA were an ideal group of academics to describe the experience of rapidly moving to virtual learning environments and then back to physical ALCs. Prior to the move to virtual learning environments in March 2020, the ALA had been proceeding with its normal format of face-to-face scholarly meetings on the use of active learning strategies in diverse disciplines, teaching in ALCs and traditional classrooms, and retrofitting existing classrooms to function as ALCs. The transition of these faculty's use of active learning strategies in ALCs, then in VLEs for an extended period, and then in all types of physical classrooms (ALCs, lecture halls, theater-style classrooms, labs, conference rooms, and traditional classrooms) when classes resumed in-person during the COVID-19 pandemic presented a compelling case to study potential change or evolution of active learning strategies.

Participant Selection

To ensure protection of human subjects, this study was submitted to the institutional review board (IRB) at the researcher's institution for approval before any processes of data collection began. This study followed an informed consent process. Purposeful sampling was used. Access to secondary data about FLC membership and participation provided by the institution's Center for Teaching and Learning, and data about faculty classroom assignments

accessed from the Office of the Registrar produced a list of participants who met the recruitment criteria to be interviewed. Participants were required to have:

- participated in the ALA for a minimum of two cohorts,

- taught classes designated as face-to-face instruction in one of the university's ALCs for a minimum of two semesters prior to the move to emergency remote teaching in March 2020,

- returned to teaching classes designated as face-to-face instruction in a physical classroom during or after fall 2021, and

- taught in a traditional classroom for a minimum of one semester at some point in their career at UNC Charlotte.

The goal of the above criteria was to identify faculty who had been deeply engaged in active learning strategy, teaching in ALCs, and participating in a FLC focused on teaching using active learning strategies. Ensuring that these faculty had also taught in traditional classrooms helped with the trustworthiness and validity of the data and was used to triangulate shared experiences examined during the data analysis.

Participant Recruitment

Participants were provided with informed consent documentation about this study. Because of the pre-existing working relationship between the researcher and the participants, the informed consent clearly stated the perceived power dynamic as well as ensured that participants, or those who chose not to participate, would not be impacted with regard to their access to Center for Teaching and Learning services and programs, as well as ALA benefits and membership. This statement in the consent documentation and recruitment email was meant to assuage any concerns over participant coercion.

A recruitment email (see Appendix A) was sent to all the ALA participants who met the recruitment criteria, and provided them with the purpose of the study and the opportunity to respond via a Qualtrics survey (see Appendix B) if they were willing to participate in the study. The target sample size was 8-10 ALA members to interview. The recruitment survey yielded 13 eligible participants. Those with the longest history of teaching in UNC Charlotte's ALCs were given preference, by the length of their tenure with the ALA, to schedule interviews until the sample size was achieved. Participants who agreed to take part in the research study received an email notification (see Appendix C) confirming their acceptance and outlining next steps. Participants not selected received an email notification (see Appendix D) that they were not selected for the initial participant group, but that they could be contacted to participate if additional data were needed. It was unnecessary to contact any participants from the secondary group, as 10 eligible participants were identified and scheduled for interviews within a six-week period.

In this study, the researcher interviewed 10 faculty at UNC Charlotte who have been deeply engaged in practicing active learning strategies, teaching in ALCs, and repeatedly participated in an FLC focused on active learning. All participants selected to be interviewed in this study exceeded the minimum 2-year-engagement with the ALA cohort requirement as reported in Table 2.

Table 2

Overview of Case Study Participants Demographics

Name	Age	Race	Gender	Faculty Rank/Title	#years ALA
Abdul Taheri	55 - 64	White-Persian	Male	Full Teaching Professor	5
Didier Levy	55 - 64	White/European American	Female	Senior Lecturer	3

Name	Age	Race	Gender	Faculty Rank/Title	#years ALA
Gilbert Parker	45 - 54	White/European American	Male	Associate Professor	5
Karla Saaranen	35 - 44	White/European American	Female	Lecturer	4
Kavita Singh	35 - 44	Asian or Pacific Islander	Female	Teaching Professor	8
Lettie Mackenzie	45 - 54	White/European American	Female	Senior Lecturer	8
Lindsay Ford	45 - 54	White/European American	Female	Senior Lecturer	7
Lisa Carter	55 - 64	White/European American	Female	Associate Professor	3
Penelope DeSouza	35 - 44	White/European American	Female	Assistant Teaching Professor	5
Sebastian Modena	45 - 54	White/European American	Female	Teaching Professor	7

Note: This table reports the demographic data collected on participants when they agreed to take part in this research study and self-reported information through an online demographic survey.

Participants were assigned pseudonyms and transcript titles were renamed with the pseudonym. A master list linking pseudonyms to original participants was kept in a secure and encrypted location that only the researcher had access to for reference during analysis. To further protect participant anonymity, any mention of personal identifiable data (PID) or site-specific data that could be used to identify the participants (colleges, departments, building names, classroom names/numbers, course names, software names, other personnel names, etc.) were deleted or assigned larger aggregate categorization names appropriate to the study results as they were cited or quoted in these findings.

Semi-Structured Interviews

The goal of interviewing in qualitative research is to obtain unique information or interpretations of a thing that the researcher is unable to observe themselves (Stake, 2010). This qualitative case study situated interviews between study participants and the researcher as the primary instrument used to capture, describe, and analyze their specific experiences. The majority of the data in this study were collected through semi-structured interviews. The researcher was responsible for the quality of the data collected, as they were responsible for strategically planning and executing all elements of the interview process (Clandinin & Connelly, 2000).

Kvale and Brinkmann (2007) described research interviewing as taking one of two metaphorical approaches: the "miner" or the "traveler." The "miner" is most closely aligned with the highly structured modern social science research process, while the "traveler" is focused on conversations and accounts provided by the interviewees. This researcher approached the interview as both a "miner" and a "traveler." Since this researcher is not a faculty member teaching in the classroom, the accounts and stories of the lived experiences provided by the participants were of the utmost interest, and what the study analyzed. In this sense the researcher is the "traveler." However, because of the researcher's close working relationship with the interviewees, taking the "miner" approach to the development and execution of the interview protocol provided additional validity and trustworthiness to the interview process.

The instrument used to collect data from the participants is a semi-structured interview protocol (see Appendix E). Case study is aligned with qualitative research methods where interviews of persons directly involved in the contemporary events being studied, and collection of descriptions and interpretations from those who have observed some phenomena, are a

preferred source of evidence (Stake, 1995, Yin, 2018). An interview protocol including a set of predetermined open-ended questions that link to the two main research questions guiding this study was used. Interviews were 90 minutes in length in order to give participants a set timeframe in which to reconstruct their experiences based on the interview protocol (Seidman, 1998). In addition, the protocol included a demographic survey that captured data relevant to the participant inclusion criteria, and sections about the participant's:

- experience practicing active learning,

- teaching in traditional and active learning classrooms,

- teaching in a virtual learning environment during COVID-19, and

- teaching in physical classrooms after the return to face-to-face instruction.

Questions chronologically targeted the participant's experiences using active learning practices in physical learning environments, virtual learning environments, and then in physical learning environments again. Questions sought to identify what, if any, changes occurred during the time in virtual environments, and whether changes then transferred to physical environments. This structured case study protocol ensured reliability (Yin, 2018). Follow-up questions were asked at the discretion of the researcher and related to the purpose of the study.

Data Collection

Each participant completed a 90-minute semi-structured interview with the researcher online using web conferencing software. Participants received a copy of the interview agenda and interview guide for review 48-hours prior to their interview (see Appendix E). Interviews were scheduled with participants via email and phone and were documented using a Google calendar and meeting invitation. Participants were sent an email (see Appendix F) outlining the interview agenda and given an opportunity to ask questions and receive answers prior to the

interview date and time. At the beginning of the interview, the study purpose, consent process, protection for human subjects, and interview agenda were reviewed again, and time was provided for the participant to ask any outstanding questions. Participants were able to stop or start participation in the interview at any time as needed.

Permission to record the interview using the web conferencing application was requested before proceeding with the interview. Participants were informed that the video portion of the interview would be deleted immediately following the interview and only the audio file would be retained for transcription and analysis. After the interview was complete, the video portion of the interview was deleted, and the audio portion was stored in a secure location. Audio files were sent for transcription using a transcription service. After the interview, participants received an email thanking them for their time and outlining next steps (see Appendix G).

After transcription, the researcher listened to the interview recordings again and checked the transcripts for accuracy, noting the time stamps for each question asked. Participants were informed after their interviews had been transcribed and participant validation was requested (see Appendix H). Transcripts were verified first by the researcher, and then using respondent validation to ensure trustworthiness and validity of the data collected (Barbour, 2001). Transcripts were shared individually with each participant via a secure and encrypted cloud-based folder. Interviewees had the ability to make any changes they saw necessary to the transcripts to convey their meaning prior to data analysis. Interviewees were given three weeks to take part in respondent validation. Once the respondent validation period was over, participant access to the folders was removed and the deidentification process began.

Data Analysis

Each qualitative research study is unique and the choice of how to code the data should remain open until after the transcripts have been reviewed (Saldana, 2013). This researcher used an inductive method of coding, where the data from the respondent validation qualitative interviews were analyzed using the process of open, axial, and selective coding to discover emerging themes based on the participants' experiences (Strauss & Corbin, 1990). If the process of coding did not yield substantive findings during the first analysis, the researcher reserved the option to change how the data were coded, coding the data multiple times, using multiple methods of coding as was necessary (Saldana, 2013).

Coding and analysis of each participant's interview was conducted individually.

- First, the interview recordings were transcribed by a transcription service.

- Next, the researcher listened to each interview while reading the transcription, making any necessary corrections for accuracy, and noting time stamps where questions were asked.

- Following this, the interview transcripts were sent to each participant with a request for respondent validation, also called member checking, as a way of validating the data thus far (Barbour, 2001; Saldana, 2013).

- Participants were given three weeks to make edits, additions, or clarifications to the transcripts. Edits to the transcripts were noted. If participants did not return edited versions, the transcript was analyzed as is.

- The researcher then read the transcripts again, this time making notes directly on the transcripts where possible topics and categories may have begun to emerge (Seidman, 1998).

- The researcher read the transcripts again, considered the notes, and began the process of open coding.

- Once coding began, the researcher used the process of reflective journaling and memo writing to capture code notes and details including the researcher's thoughts on topics, categories, hypotheses, and general questions in order to have supporting documentation for a well-developed analysis (Corbin & Strauss, 1990; Saldana, 2013).

- Transcribed interviews were broken into discrete parts, first using color coded sticky notes and Taguette, a free and open source qualitative data analysis tool, and assigned initial codes. Any direct quotations that might have been used in the study were highlighted and assigned codes.

- During axial coding, all coded transcript parts were read over again, organized by topics that crossed participant experiences, and structured into categories aligned to a particular research question (Stake, 2010).

- Finally, the researcher moved to selective coding where the coded and categorized results were formatted into a series of themes that told the story of the interviewees' experiences as they related to the research study's questions (Saldana, 2013).

Final analysis and recommendations can be found in Chapters 4 and 5 respectively.

Trustworthiness

Qualitative data obtained from this exploratory descriptive case study are in the form of audio interviews, transcribed, and member checked by the participants. When qualitative data is being used to construct knowledge, multiple methods of triangulation can support that the understood meanings are valid (Stake, 1995, 2010). Member checking, also called respondent

validation, was one triangulation protocol used in this study. Participants were asked to review drafts of their transcripts and validate that the words captured reflected their intended meaning as a strategy for trustworthiness (Saldana, 2013; Stake 1995). Giving the participants an opportunity to review and edit their transcripts prior to analysis helped to ensure that the data collected in interviews have construct validity (Yin, 2018). In addition, as analysis was being conducted, the researcher used data triangulation while comparing interview transcripts to participant invitation survey responses to ensure that reported demographics and experiences were accurately represented in the findings (Stake, 1995, 2010). Findings in Chapter 4 were written using rich, thick descriptions meant to share the participants' experiences in such a way that the reader can clearly understand their perspective and feelings; this method added yet another layer of validity to the findings in the study (Creswell & Creswell, 2018).

Limitations and Delimitations

A delimitation of this exploratory descriptive case study is that the interviews conducted represent a small sub-group of instructors practicing active learning strategies at one public university in the United States. Findings cannot be generalized across all higher education institutions. However, the rigorous attention paid to the data quality yield rich descriptions of the faculty experiences that can transfer to other institutions of higher education. Additional limitations that occurred during the study are reported in Chapter 5.

Summary and Transition

This qualitative exploratory descriptive case study presents the researcher and readers with a unique opportunity to reflect on the evolution of active learning strategies within a novel scenario; a time when rapid change occurred in teaching practices out of necessity. This was the first time that higher education had faced a pandemic with the technologies at hand to continue to

facilitate learning from a distance and replicate the experience of being together in a classroom in a virtual environment. The extended period that courses were online at the research site, combined with the abrupt return to face-to-face classes at full capacity, presented changed skill sets and expectations from both faculty and students. This study explored how active learning strategies evolved during the time in virtual learning environments and describes teaching practices and examples of the ways active learning strategies in physical classrooms present going forward.

CHAPTER 4: RESULTS

This chapter presents the results of data collection from participant interviews in this exploratory descriptive case study with the purpose of understanding the experiences of faculty learning community (FLC) members practicing active learning strategies in virtual learning environments (VLEs). The goal was to discover how teaching in virtual spaces for an extended period of time impacted the use of active learning strategies in physical classrooms. Ten faculty at the case study institution participated in semi-structured interviews, guided by this purpose and the following two research questions:

1. How did faculty learning community members practice active learning strategies in virtual learning environments?

2. How did the experience of practicing active learning strategies in virtual learning environments for an extended period of time influence how active learning strategies are practiced in physical classrooms?

The chapter begins with a description of each participant interviewed and their historical involvement with UNC Charlotte's Active Learning Academy (ALA) community. This chapter concludes with a summary of the data analysis findings and discusses next steps.

Participant Summary

The following is a brief description of the 10 participants, along with a short summary about why they joined and rejoined the ALA faculty learning community. These data help to illustrate each participant's engagement with active learning practice and experience teaching in active learning classrooms (ALCs) at the case study institution. Summaries were informed by triangulation of data from the demographics survey and the interview protocol. Each participant's name has been changed to ensure confidentiality and protect the anonymity of their identity. In addition, any

mention of proprietary digital tools or technologies used by name in direct quotes that follow in

the below analysis has been substituted with deidentified synonyms, for example:

- all learning management systems (Blackboard, Canvas, D2L, Moodle, Sakai) are

  referred to as LMS,

- all web conferencing systems (Microsoft Teams, WebEx, Zoom) are referred to as

  web conferencing software,

- all discussion forums (Campuswire, Discord, GroupMe, Slack) are referred to as

  discussion boards/forums,

- all polling software (Kahoot!, Mentimeter, Poll Everywhere, Survey Monkey) are

  referred to as polling software,

- all online shared document tool software packages (Adobe Cloud, Google Apps,

  Microsoft Office Online) are referred to as online shared documents; and

- all online shared white boards (Jamboard, Miro, Whiteboard.fi) are referred to as

  digital whiteboards.

The broad deidentification of specific digital tools cited by study participants to practice active

learning strategies in VLEs will help to ensure that their identities remain unknown.

Abdul Taheri – Participant #1

Abdul Taheri is a White/Persian male between the ages of 55 – 64 holding the rank of

Full Teaching Professor. Taheri disclosed that they had taught at UNC Charlotte for eight years

when this interview was conducted. Taheri started out as a teaching associate professor and was

promoted to full teaching professor. Taheri teaches courses in a STEM field.

Taheri joined UNC Charlotte after teaching at a smaller school where they practiced

active learning on a "smaller scale." with class sizes averaging around 30 students. At UNC

Charlotte, Taheri was assigned to teach large classes with sections of 200 students each in lecture halls. This led Taheri to begin to seek active learning spaces for their classes to meet. Taheri's teaching philosophy is rooted in learning cycles and iterations, and they practice cooperative and experiential learning. Taheri joined the ALA to exchange ideas and information with a larger group of likeminded scholars outside their department and to gain access to teach in the specialized large active learning classrooms that were part of the FLC member benefits.

Didier Levy – Participant #2

Didier Levy is a White/European American female between the ages of 55 – 64 holding the rank of Senior Lecturer. Levy taught at UNC Charlotte for seven years as an adjunct prior to becoming a full-time lecturer in 2007. Levy had a total of 22 years of experience teaching at UNC Charlotte when this interview was conducted. Levy teaches courses in the humanities and held an administrative role in their department for five years as well.

Levy's main motivation for joining the ALA was to collaborate with other people, from outside their discipline, on professional development that could enhance their teaching practice. Levy is constantly looking at how they are teaching and asking if there are better methods or practices and believes that the best way to accomplish this type of learning is through a community of practice. Levy also considers themselves to be on a "secret mission" so see how others are incorporating their discipline into other courses across campus, and to have influence on that if possible. Levy calls this a "departmental self-serving mission" that is part of their participation in the FLC as well.

Gilbert Parker – Participant #3

Gilbert Parker is a White/European American male between the ages of 45 – 54 holding the rank of Associate Professor. Parker had taught at UNC Charlotte for eight years at the time of

this interview. Parker teaches courses in the humanities and has taught for two different colleges over the years.

Parker was persuaded to join the ALA by one of the FLC leads facilitating the program through UNC Charlotte's Center for Teaching and Learning (CTL). As part of the promotion of the first ALA in 2014, the CTL visited different departments to share information about the FLC and recruit faculty to join. The words "active learning" are rooted deeply in Parker's personal teaching philosophy and the learning community felt like a "natural fit" to join. Parker was also an Assistant Professor at that time, and the professional development aspect of joining the ALA seemed to be a wise choice. Parker also stated the value of forming professional relationships with colleagues outside of their field that the ALA makes possible. As a result of their participation, Parker partnered with two other members of the ALA (all from different disciplines) and received a two-year grant to conduct scholarly research.

Karla Saaranen – Participant #4

Karla Saaranen is a White/European American female between the ages of 35 – 44 holding the rank of Lecturer. Saaranen had taught at UNC Charlotte for seven years at the time of this interview. Saaranen was a part-time adjunct faculty member for three years before moving to a full-time lecturing position in 2018. Saaranen teaches courses in a STEM field.

Saaranen had practiced active learning strategies, like the flipped classroom model, at the academic institution they worked for before joining UNC Charlotte. Their desire to continue engaging in active learning practice, and a recommendation from a colleague in their department, led to them joining the ALA faculty learning community. The colleague shared benefits of joining the ALA, including: a community of like-minded people from their department also participated and created an informal departmental learning community, participation led to

collaborations with seasoned colleagues, assistance with learning how to practice active learning in large classes could be gained (Saaranen had previously taught classes of 25 students and now was being asked to teach 200 student lectures), and there were chances for professional growth like leadership experience and publication opportunities offered through the FLC. Saaranen expressed that the first year they took part in the ALA, they felt they didn't "maximize the benefits" of the program, and were focused on other professional development, so they joined again. The second year they participated, they really felt they had a positive experience working in a cross-disciplinary team and they partnered with other members and received a grant to conduct scholarly research. They continued with the FLC and served as a facilitator the following year.

Kavita Singh – Participant #5

Kavita Singh is an Asian or Pacific Islander female between the ages of 35 – 44 holding the rank of Teaching Professor. Singh had taught at UNC Charlotte for eight years at the time of this interview. Singh started out as a teaching associate professor and was then promoted to full teaching professor. Singh teaches courses in a STEM field.

Singh's motivation for joining the ALA was to learn about how others practice active learning in their classes. Singh intended to join for just one year but ended up participating every year after. Singh's goals in engaging with the ALA were to learn from other's experiences and to share their own experiences with active learning. Singh was also interested in how different disciplines practice active learning and gained new ideas from interacting with diverse colleagues through the FLC.

Lettie Mackenzie – Participant #6

Mackenzie is a White/European American female between the ages of 45 – 54 holding the rank of Senior Lecturer. Mackenzie had taught at UNC Charlotte for 20 years at the time of this interview. Mackenzie joined UNC Charlotte as an assistant professor then chose to move into a lecturer position. Over the years they were promoted to senior lecturer. Mackenzie teaches courses in a STEM field.

Mackenzie had been working with active learning practice and strategies during their graduate studies in collaboration with their mentor, a seasoned teaching and learning professional. Mackenzie said active learning strategies were something they were always using, and when the opportunity to join a learning community that would focus exclusively on active learning practice came up, they knew it made sense to join. Their first motivation for joining was the connection with other people across campus who also wanted to practice active learning, their second motivation was to gain access to teach in the active learning classrooms. Members of the ALA had priority scheduling for two ALCs at UNC Charlotte. Mackenzie also stated that they had a collegial friendship with one of the CTL leads facilitating the program and that this was "a bonus."

Lindsay Ford – Participant #7

Ford is a White/European American female between the ages of 45 – 54 holding the rank of Senior Lecturer. Ford had taught at UNC Charlotte for 11 years at the time of this interview. Ford joined UNC Charlotte as a lecturer and was promoted to senior lecturer in 2016. Ford teaches courses in a STEM field.

Ford joined the ALA on the recommendation of a colleague who suggested it would be good to get involved with CTL projects and academies. Motivating factors included: the ability

to work with people outside your department and discipline and form collaborations and conduct studies with them, have a community of peers to bounce ideas off of, and priority access to teach in the active learning classrooms.

Lisa Carter – Participant #8

Carter is a White/European American female between the ages of 55 – 64 holding the rank of Associate Professor. Carter had taught at UNC Charlotte for 23 years at the time of this interview. Carter joined UNC Charlotte as an assistant professor and was promoted to associate professor in 2006. Carter teaches courses in a STEM field.

For the first 10 years of Carter's career at UNC Charlotte they were focused on research and grants and lectured during their classes. Then, due to a change in personal circumstances, Carter found they had time to focus more on their teaching practice and began seeking alternatives to lectures that would engage their students. Carter and another colleague began practicing an active learning approach that involved the use of groups and customized lesson workbooks. The timing of Carter's pedagogical change coincided with the beginning of the ALA and Carter joined. Carter's main motivation for joining the ALA was to gain access to teach in the active learning classrooms. Carter has rejoined the FLC for the community. Carter expressed that it can feel very lonely and siloed in your discipline's department, and that the ALA provides a valuable opportunity to learn different tools and strategies with other faculty that you might not otherwise have a chance to interact with.

Penelope De Souza – Participant #9

De Souza is a White/European American female between the ages of 35 – 44 holding the rank of Assistant Teaching Professor. De Souza had taught at UNC Charlotte for six years at the

time of this interview. De Souza joined UNC Charlotte in 2016. De Souza teaches courses in a STEM field.

De Souza joined the ALA with the goal of learning how to teach and to gain training on how to be an educator. De Souza acknowledged that as a junior faculty member, and as a specialist in their discipline, any opportunity for professional development about teaching strategies was a benefit and a reason to participate in the FLC. Other colleagues recommended the ALA to De Souza. De Souza has continued to join the ALA because they felt that each year they learned and discovered new things, there were advantages and opportunities provided through the FLC, and that collaborations with faculty from other disciplines were valuable in interacting with students who were not majors in their department.

Sebastian Modena – Participant #10

Modena is a White/European American female between the ages of 45 – 54 holding the rank of Teaching Professor. Modena had taught at UNC Charlotte for 15 years at the time of this interview. In addition to teaching, Modena also held an administrative role in their department for 11 years. Modena teaches courses in a STEM field.

Modena had been transitioning from lecturing to implementing student-centered active learning strategies into their classes for five years when the ALA was formed. Modena thought this would be an excellent opportunity to collaborate with colleagues across campus and those within their department. Modena was specifically interested in the opportunity to take part in professional development in an active learning classroom, so that they could learn more about how to use the specialized technology while gaining practice with the layout of the space using active learning strategies with groups. Modena had heard about a popular active learning approach that other participants were using and hoped to learn more about it through

participation with the FLC. Modena was also motivated to join the ALA because of the priority access to teach in the active learning classrooms that members were granted.

<div align="center">**Themes**</div>

The 10 participants exceeded the criteria for inclusion in this study and their individual experiences teaching in VLEs were intriguing cases to analyze. They openly shared about their engagement with the ALA and about their experiences practicing active learning strategies in ALCs and in traditional learning environments at UNC Charlotte. They spoke frankly about the events that occurred when they quickly moved their courses online in March of 2020 due to the COVID-19 pandemic and shared rich details about what followed, both from their lived perspective and from the perceived experiences of their students. In addition to the spring 2020 semester, the participants shared what it was like to try and practice active learning strategies in VLEs for a full academic year (fall 2020 – spring 2021) before returning to in-person learning environments in fall 2021. Based on the data analysis from these in-depth interviews, three overarching themes emerged: (1) "Working the Room;" (2) "It's Not in the Syllabus;" and (3) "Virtual In-Person Classrooms (VIPCs): The Best of Both Worlds."

Theme 1: Working the Room

Prior to the pandemic, participants were teaching in physical ALCs using a customized course design with specialized active learning strategies. Each participant "worked the room" in a different way, with the goal of practicing student-centered pedagogy that engaged students in deep learning in the ALC. In the physical ALC, the space and reconfigurable tables and chairs could form pods that provided the ability for students to work together in groups, a hallmark feature of ALCs that supported active learning strategies. Participants described how they engaged with the space and the students. For some participants this meant the ability move

quickly between student groups "like a shark" (Levy) listening to group discussions and interjecting useful feedback, while for other participants it meant being able to sit in the middle of the physical space and observe and listen to student groups working at the same time, absorbing learner engagement at a micro and macro level (Taheri). In the physical ALC, faculty were challenged by how the table pods were organized and how access to electricity was distributed throughout the classroom space. Students did not have storage space other than the floor (Taheri), or students with laptops needed to be close to an electrical outlet and there were cords all over the floor (Levy). These issues sometimes made it hard for faculty members to move freely and engage with students as they practiced active learning strategies. In spite of this, ALCs were popular and frequently booked to capacity.

Engagement in ALCs was also supported by the use of ALC technologies, like digital displays, whiteboards, microphones, speakers, projectors, and document cameras. These embedded technologies made facilitation of active learning strategies and exercises easier for student collaboration (Ford). A popular strategy of having students report on course content, or present projects to the whole class, was accessible to all students because of the placement of digital displays and microphones at each table pod and whiteboards strategically placed around the classroom (Parker).

When participants quickly moved their courses online due to the COVID-19 pandemic, they lost these physical rooms and gained a virtual room that they needed to learn how to "work" in new and different ways. The theme of "Working the Room" was derived from participants' shared stories of how they translated their experiences teaching in ALCs and added the use of virtual tools that replicated physical classroom elements to help them practice active learning strategies in VLEs. Questions from the semi-structured interview guide that informed this theme

were: (1) How did you modify your courses that were being taught in ALCs for virtual delivery? 2) What active learning strategies did you use in the virtual learning environment? 3) How did the active learning strategies change from how they were being used in the ALC? 4) What challenges did you face practicing active learning strategies in virtual learning environments?

To clarify this theme the researcher organized findings into categories of experiences and actions shared by participants during their interviews. The categories that make up this theme include: impact of course design on transition, the virtual reality ALC (VR ALC), and inactive classrooms.

Impact of Course Design on Transition

The first category in the "Working the Room" theme is impact of course design on transition. Participants interviewed shared personal feelings and practical experiences with the transition to VLEs and how their existing active learning strategies translated (or didn't translate). Two participants, Modena and Ford, did not find the transition to be easy and shared stories of reverting to pedagogical practices they were comfortable with. Modena shared:

> *When we were forced to leave campus, I am not proud of this... we are going to be frank here, I just went back to what I knew how to do (laughter) and so I had made a lot of videos for the course that I was teaching.*

Similarly, Ford also made videos and noted that it reduced their use of active learning strategies:

> *When I transitioned that course online, I made recorded videos for the students to watch and it definitely diminished. I didn't use polling software, or polling questions during the videos because I really just made videos. I did keep a few exercises that the students*

would normally do, but instead of making them collaborative at that point I didn't. I

preferred to make them individual.

However, four other participants, Taheri, Carter, Singh, and De Souza, had the opposite experience, and they cited their use of active learning strategies as the reason for an easier transition. For example, Singh's use of the flipped classroom active learning approach meant everything was already set-up in the online learning management system (LMS): videos, pre-class lecture content, quizzes, in-class activities. This was a time saver for Singh and meant less worry about the transition to VLEs. Similarly, DeSouza was able to easily transition their existing active learning approach to the web conferencing software using other digital tools and reported they felt not much had changed other than they were practicing the active learning strategies online. Taheri's existing active learning strategies using groups translated well:

So, when we went virtual in March of 2020 I had no problem because I already built the

active learning groups, I already worked with them. My course was very manageable.

That transition was not difficult for us at all.

Carter shared that the transition was not that hard because practicing active learning strategies had set them up for success in VLEs, though they were actively seeking tools to replicate their physical classroom:

So, in the spring of 2020, I have to say I was so grateful that I'd been teaching active

learning since 2014. My teaching did not change that much when we went from in person

to online. So much new technology… and the hardest part was learning how; not just

learning how to use the new technology, it was almost like I was looking for the

embedded technologies that I had in the classroom, the equivalent, you know virtual

technologies.

Participants had no choice but to quickly move from ALCs to VLEs in March 2020 due to the COVID-19 pandemic. Participants were open and vulnerable in sharing their experiences with this move. The participants are faculty known for practicing active learning strategies, and the criteria for selection ensured they were seasoned active learning practitioners. The fact that some participants shared that they did not know what to do in the new learning environment and responded by lecturing or just showing videos is straightforward and forthright. Participants who did not struggle with the transition explained how the design and organization of their course, choice of active learning strategies, and even their learning management system content, contributed to an easier move to VLEs. As Modena shared, getting students to "buy-in" to active learning strategies had a lot to do with the learning environment supporting student-centered engagement. How participants responded to taking the VLE and making it convey that message to students during such a quick and unexpected move was both personal and practical, based on the current state of their active learning practice and their willingness and readiness to transition their active learning strategies to VLEs.

The Virtual Reality Active Learning Classroom (VR ALC)

The second category in the "Working the Room" theme is virtual reality active learning classrooms (VR ALCs). All participants attempted to create VR ALCs to keep students engaged and to continue practicing their chosen active learning strategies when the move to VLEs occurred. As Carter stated earlier, they were looking for equivalent digital tools that would replicate the technologies they had in the ALCs. Digital tools participants used to replicate features and functions of ALCs fell into five major categories: 1) learning management system (LMS) tools, 2) web conferencing software tools, 3) online shared document tool, 4) third-party software, and 4) hardware. Appendix K represents a description of the types of digital tools

participants reported using and their purpose/goal. Significant findings show how participants engaged with these digital tools in ways they had not tried before for the purpose of continuing to practice active learning strategies in VLEs. The effort required to attempt these pedagogical changes cannot be understated. The following explores and describes examples of participants' experiences with specific types of digital tools in VR ALCs, the positive outcomes and challenges, expressed candidly during interviews.

Use of the institution's learning management system (LMS) was a non-negotiable digital access tool during the time spent in VLEs. If participants had not previously organized their course content in the institution's LMS, the move to VLEs required this change. All participants in the study mentioned that they were already using the LMS site to store their content or that they made changes to the site during the time in VLEs. Carter stated: "My LMS page actually got better because I was more organized."

Participants used the LMS built-in engagement tools to provide online solutions that could help replicate features of the ALC and support practicing active learning strategies in VLEs. Ford, Modena, and Saaranen uploaded recorded videos to the LMS to replace their physical presence in the classroom. Modena and Singh had a practice of giving quizzes in ALCs where students were encouraged to collaborate with each other before submitting the final answers. This practice carried over into the VLE using the online quiz builder and online group communication tools provided by the LMS. Ford and Saaranen used discussion boards to capture student personal preferences for working in groups, then formed groups that would (theoretically) work well together. While many participants were able to "work the room" in the VLE with the LMS, some faced challenges. Carter and Taheri both tried to use the LMS discussion board, but students chose to use a third-party tool for discussions that instructors did

not have access to, which made monitoring discussions difficult. Despite successes and challenges reported, a major outcome for all participants was that they all became familiar with the institutional LMS and attempted to "work the room" in VLEs to practice active learning strategies and experimented with its capabilities in a way that they had not prior to the move online. This was a significant finding for all participants.

Use of the institution's web conferencing software was the other non-negotiable digital access tool participants needed to teach during the time spent in VLEs. Other than the LMS, the main delivery method of online courses in VLEs was web conferencing software. Participants at UNC Charlotte started with one web conferencing software system in spring 2020, then transitioned to a different web conferencing software system over the summer of 2020. The pressure to learn both platforms and to "pivot" was stressful. Participants had to quickly learn how to use the built-in engagement tools in VLEs to replicate the ALC and support practicing active learning strategies at the same time.

Most participants in the study adjusted to the change quickly, however several made comments about how transitioning to the tool was not easy. Carter specifically stated that if the university wanted faculty to successfully teach using web conferencing software they should pair them with a "technology specialist" to support their classes. De Souza started out their course using the web conferencing software provided by the institution, but once their students were acclimated to the course, they chose to switch to an entirely different third-party software that was not supported by the institution's Office of OneIT because it supported their active learning strategies and student engagement better. Six web conferencing tools reported by some participants as being popular for replicating active learning strategies also caused frustration for

other participants attempting to "work the room" in VLEs: 1) chat feature, 2) web cameras, 3) break out rooms, 4) emoticons and reaction symbols, and 6) screen sharing.

Parker, Levy, and Singh successfully used the "*chat*" formally and informally to share resources with students and to gather feedback while practicing active learning strategies in VLEs. However, Carter reported having a difficult time getting students to engage with the chat in general.

Despite university policy not requiring students to turn on their "*web cameras,*", one participant, Levy, required students to have cameras turned on as a course policy and worked to protect student privacy by teaching them how to use digital backgrounds. Levy told students the required camera use was in support of classroom community and engagement as well as preparation for what they would experience in the real world. In juxtaposition to this, participant Mackenzie did not require cameras, sharing their own personal experiences with "crappy WIFI" that was unstable, inconsistent, and could not provide dependable connectivity needed for camera use.

All participants did use "*breakout rooms*" in the web conferencing software to replicate the small breakout groups they used in ALCs. Saaranen successfully used breakout rooms by reserving the entire synchronous time block for students to work in their assigned groups through using a flipped classroom model active learning strategy. In contrast, Singh, Carter, and Mackenzie struggled with breakout rooms, sharing that they had trouble managing time moving between breakout rooms, answering questions for each group equitably, and getting students to engage with one another. When talking about trying to move between rooms and support students, Carter stated: "It took away my ability to listen to my students effectively." In an attempt to "hear" students, Parker used emoticons in the web conferencing software as a tool for

understanding student reactions during icebreaker activities, while Levy used them as a way to "read the room" when many cameras were turned off, and Singh used them for reactions to questions.

In support of the LMS and the web conferencing software, UNC Charlotte had an enterprise license for a cloud based *"online shared documents"* software package that included: text editing documents, spreadsheets, presentations, digital whiteboards, forms, and other similar tools. Online shared documents were being used before the pandemic, but once participants moved to VLEs they realized how indispensable the tools were for replicating group collaboration on assignments and coursework similar to what they would have facilitated in ALCs with physical course materials.. Ford, Modena, Levy, Singh, and De Souza used online shared documents for group work and collaborations among students in VLEs. Levy also used online shared documents to collect feedback from students so they could make changes to how the course was managed to support student success.

One specific *"online shared document"* that was repeatedly mentioned by participants was the *"digital whiteboard,"* an online tool that replaced physical white boards from the ALC and provided a place for students to collaborate and brainstorm ideas. Ford, Modena, Carter, and De Souza used digital white boards. Levy created prepopulated slides as backdrops for the digital white boards for students to work on. Singh used digital white boards to replace paper assignments. Mackenzie used digital white boards to replicate writing that happened on the walls in their ALC. Saaranen used digital white boards to replace in-class white board work, but shared they felt that the tool was inferior to the physical equivalent.

Additional online shared documents included *"online forms"* used to capture information, feedback, and surveys from students. Ford, Saaranen. Parker, De Souza, and

Makenzie used online forms for reflections, check-ins, questions, general feedback, and requests for help. However, not everyone was sold on online shared documents. Carter stated: "I hate online documents, I don't understand it." The majority of participants interviewed embraced online shared documents as a tool for "working the room" in VLEs, noting that it was one way they were able to continue engaging students with active learning strategies and replicating some of the pedagogical practices they used in ALCs.

The use of a popular *"online polling software"* was supported by the institution at the enterprise level as a way of engaging students with question prompts and had been used in ALCs prior to the move to VLEs. Participants also had access to a polling software tool within the web conferencing software that they could use to ask questions of the class synchronously. Levy, Singh, Saaranen, Carter, Mackenzie, and De Souza all used polling software to practice active learning strategies in VLEs by modifying existing strategies like "think-pair-shares," employing a low stakes quiz, or gamifying an activity.

Three participants reported turning to vendor *"adaptive learning courseware packages."* These third-party courseware packages included: content, videos, assignments, projects, quizzes, tests, assessments, remediation, homework, and resources with active learning strategies built into the course design that typically ran through the institution's LMS or a stand-alone website. Modena, Carter, and Mackenzie all reported using one of these tools. Carter explained they used one of these courseware packages because it "just gave me a breather." The consensus among participants who used these tools was that they had solid course design elements in place, employed active learning strategies, and took the pressure off participants to have to analyze, design, develop, implement, and evaluate their teaching and learning methods, pivoting with

every new development, during a highly stressful time in higher education. These tools allowed participants to work smarter, not harder.

Another enterprise supported third-party tool some participants engaged with allowed for *"online submission and grading of alternative assessments."* This tool allowed students to submit paper and three-dimensional assignments that could then be viewed, notated, and graded online by instructors, through the institution's LMS. Carter used this tool during the pandemic and has continued to use it even after the return to physical classrooms.

While UNC Charlotte's Office of OneIT department made it clear that they could not support third-party software, the ability of these digital tools to engage students in active learning strategies and replicate ALC conditions was strong enough for participants' natural curiosity and love of learning new things to lead to experimentation and use of these tools. Some of these tools even went through the official process for adoption by the institution and are now supported at departmental and enterprise levels.

The software participants used to "work the room" in VLEs could not run without *"hardware."* Hardware discussed in this section is specific to tools that were necessary for students to practice active learning strategies in the VR ALC based on participants' shared experiences. *"Cell phones and smartphones" played* a crucial role in practicing active learning strategies in VLEs. One of the easiest ways for a student to submit an assignment if they did not have access to a computer was with their cell phone/smartphone camera. The camera was used to document (photograph) and submit assignments, either through the phone itself (the LMS had an app) or through a connection to a computer and to the LMS. Ford would have students take photos of physical assignments and upload the image to the LMS for assessment and grading.

Students in Saaranen's asynchronous courses exchanged phone numbers and emails with their active learning teams and texted/messaged as a way of communicating about coursework.

Participants used digital tools to replicate the active learning classroom, striving for a VR ALC as a way of practicing active learning strategies. The goal was to keep students engaged by "working the room" in the VLE using these tools. While varying results were reported by participants, the digital tools that were experimented with by participants over this extended period of time mark a watershed moment for faculty in higher education.

Inactive Classrooms

The final sub-category that makes up the "working the room" theme is that of inactive classrooms. Inactive classrooms are learning environments where students are not engaged. Traditional classrooms and lectures presented by a sage-on-the-stage have been shown to not engage students as successfully as classrooms with faculty practicing active learning strategies. VR ALCs presented their own challenges. Once participants were fully immersed in VLEs, using digital tools to attempt to replicate the active learning strategies used in the physical ALCs, participants found they faced challenges that required adjustments to their pedagogy in an attempt to keep students engaged and collaborating with each other. Singh could be speaking for all participants when they simply stated: "My biggest challenge was student engagement."

Course design impacted student engagement. Parker shared about their personal challenges reimagining how to create collaboration in the VLE, as half of their assignments from the ALC were collaborative in nature. Modena, who was teaching asynchronously, reverted to having students work individually when their classes were virtual, because trying to get them to collaborate was too challenging. Knowing if the students were actually participating and engaging was too hard to capture. This recurring theme among the participants of assessing

group interaction and collaboration is articulated by Ford as the inability to be able to interact with students in the moment due to asynchronous work assignments. In synchronous situations, breakout rooms also presented limitations; Levy shared challenges with group engagement and communication that occurred in synchronous web conferencing sessions and breakout rooms:

> *I could be in the entire break out room at one time, but I couldn't even know when I went to a small break out room if they were pretending to be on task because I was there. Was it just for me? I am ok not having all this control in the classroom, but it was like the next level of not having control, because they did not want to talk as a full class hardly ever. In the end I think it's a community thing, because in a real classroom they'll talk, but they were not having it in the online class. So that was hard...*

Similarly, Carter faced challenges with synchronous breakout rooms, pointing out the inability to listen to the entire class working in their groups at once, something that web conferencing software and breakout rooms could not replicate from physical classrooms:

> *I think until I figured out break out rooms, and even after I figured out break out rooms, it was still hard to monitor the breakout rooms. You know because one of the things you need is to be able to sit in the middle of the room and listen to what you hear. And with break out rooms, I had to interrupt them in order to get there, and the way I've been learning to teach is to listen for... to listen for someone, I can't even explain what I listen for, but it took away my ability to listen to my students effectively.*

Lack of familiarity with peers led to lack of engagement for students in VLEs. If participants were teaching synchronously using breakout rooms, they had to manage the large class web conference session while navigating moving in and out of the breakout rooms. When they did try the navigation, they found many students were simply checked out. Taheri shared

their experience trying to engage students in breakout rooms and how it ultimately led them to use less active learning strategies:

> *When we went fully virtual in 2021 that was not good, because these students, particularly freshmen, didn't know each other at all, did not have any time to socialize. I had activities that pretty much didn't work online, and because I was not seeing them anymore I was switching through… how many groups can you go through in 10 minutes? I was going to maybe four groups, if I was lucky five groups, I was going there and asking: 'Why are you guys quiet? We just introduced each other. So, did you guys have anything to talk about? Football team you like? What do you do?' Nothing was coming up... it was quiet... whereas in the active learning classroom you would see these people who have the energy to talk and then you spend 2-3 minutes sometimes trying to get them to be quiet and listen. Now, they get bored... It was a lot of work and I started using less active learning.*

Mackenzie and Saaranen also ran into issues with students working independently with their camera's off instead of being actively engaged in the assignment they have been given to work on as a group.

Despite all the effort on behalf of the study participants, all the digital tools leveraged, the VLEs were in many cases "inactive classrooms." Theme 2: It's Not in the Syllabus, explores participants' experiences in relation to issues like student apathy, the impact on practicing active learning strategies in VLEs, and the effect it has on how active learning strategies are now practiced in physical classrooms.

Theme 2: It's Not in the Syllabus

The theme of "It's Not in the Syllabus" was derived from participants' experiences practicing active learning strategies in VLEs for an extended period of time due to the COVID-19 pandemic and the unique teaching and learning practices that occurred as a result. The syllabus is traditionally a document that provides structure and predictability to an academic course for both students and faculty. Faculty are known to both jokingly, and in all seriousness, tout "It's in the syllabus" to any question a student may pose about a process, procedure, or standard guiding an academic course or any situation that may arise affecting the student or faculty member during said course.

However, the word "pivot" became attached to almost everything the administration did to support the continuation of learning in higher education due to the COVID-19 pandemic. Listening and responding to student needs and providing flexibility was stressed by institutional leadership. Faculty became flexible in ways that were unheard of prior to the pandemic and broke with traditional syllabus standards surrounding attendance, deadlines, and communication guidelines. Pivoting meant the syllabus was constantly changing based on data gathered in the moment about student needs. Recognition that learning had to continue despite the continuing health crisis the world was facing led to extraordinary measures being taken to provide safe learning spaces to bring students back onto campus and into physical classrooms. The focus of all decisions was on what will engage the students, what will keep them enrolled, what will make them return to campus. Syllabus policies about physical distancing and mask wearing were short lived and only seriously implemented for a semester. Lack of faculty recognition led to decline in morale. Faculty worked a large amount of unpaid overtime to ensure student success throughout a global crisis while experiencing the same events as their students.

Questions from the semi-structured interview guide that informed this theme were: (1) What challenges did you face practicing active learning strategies in virtual learning environments? 2) What was different about teaching in a physical classroom since the last time you had taught in an ALC? 3) How did the design and/or layout of the classroom affect your choice of active learning strategies? 4) Did your experience teaching in virtual learning environments influence how you now practiced active learning strategies in the physical classroom? 5) Is there anything else you would like me to know about?

To understand this theme fully, it has been organized into the following categories: student voice, proximity safety, flexible arrangements, and inconvenient hardships. These categories provide a rich description of what participants shared and directly speak to how the extended period of time teaching in VLEs impacted faculty and their students in unpredictable ways that did not conform to any schedule, framework, or structure that could be counted upon for stability.

Student Voice

The first category is student voice. Student voice is a combination of two codes: student choice and student feedback. Student voice was used by the participants interviewed to help students understand how to engage in group work in VLEs, a space that was challenging for group and teamwork in general. Group or team-based interaction is a foundational element for the majority of active learning strategies. Saaranen and Ford used a survey based on student choices to form groups as a way of helping students feel more comfortable with group dynamics. After the first semester of purposefully forming groups, they moved to letting students view the answers to the questions in the discussion board and then self-select their groups:

So, I had them all post in the discussion forum where they had to answer questions about themselves. What's your major? How do you prefer to work? Are you a morning person, are you a night person? Are you a procrastinator? Do you freak out if stuff doesn't get turned in early? And then I went through, and I grouped them based on those things.

Both Saaranan and Ford used student choice in VLEs as a way of organizing space for group engagement to facilitate active learning strategies without a traditional physical space providing structure. This structure surrounding a space for groups to learn together was necessary for the active learning strategies being practiced to actuate. Another way of looking at student choice had to do with use of technology in VLEs and student comfort level with technology. Mackenzie found varying levels of skill with online tools and provided different choices for how students could complete and submit assignments to accommodate all students:

Learning how to provide choice for my students between analog and digital was another thing that I had to have more uniformity for. Expectations for what a product was going to be turned in like, in person. But given people's level of comfort with digital tools, or the kinds of tools they have available to them, I expanded a little bit so people could use sketching in some of my active learning assignments or activities and be able to do it on paper and take a picture of it if that was easier for some people than using a digital tool to do a digital sketch.

Saaranen, Ford, and Mackenzie recognized that the transition to VLEs was challenging for students on multiple levels and used student choice as a tool to help bridge the gap. The move to VLEs brought to light how many students were not prepared to use new and existing technologies, or did not have the access to the technologies, and faculty had to pivot to provide

alternate options. Student choice was necessary in order for there to be a level playing field for all students to be successful and to meet basic needs during the time in VLEs.

Student voice also included the solicitation of and response to student feedback. Student feedback was used by the participants interviewed to understand the student experience of learning in VLEs and again later returning to in-person classrooms during an ongoing pandemic after an extended time in VLEs. Participants discussed wanting student feedback so they could modify course delivery to provide a better online or classroom learning experience for students.

Ford made use of weekly reflection surveys through the LMS when courses moved online to gather feedback and try to hear things from students that they may not share with them otherwise, including if online group work was going smoothly:

> *The other modification was that we began collecting weekly reflection survey feedback from students as well. I asked: What is the most important thing you've learned? The students will talk about the important thing that they learned and about what questions that they have that weren't addressed somewhere else and didn't feel comfortable asking. It was like: Is there anything else you would like me to know, or you would like me to ask about? And I would also ask how the groups were working together: Did everyone show up in your designated meeting time? If not, did you check in with them? The reflections are a major way I can provide resources for my students.*

Ford also used polling software in VLEs to gather feedback from students and provide additional academic support:

> *I also added polling check in questions that I still use; maybe it's an image of how are you feeling today or something like that. The reflections were one way that I captured what was happening with my students. It was something that we decided to do after each*

week's topic was to check in: What did you learn? We ask questions like: How familiar

were you with data, accessing data, how are you doing? Is there anything else that you'd

like to know?

Parker shared how using a post group activity assessment during the time in VLE was so

beneficial they have continued to use it now that they have returned to in-person classes.

Levy, Ford, and Parker were all working with one goal in mind; gather student feedback

and improve student learning experiences by hearing and responding to student voices. The ways

each of them went about providing choices and collecting feedback varied and overlapped in

many ways. The act of providing feedback is a choice on the behalf of the student, and when an

instructor acts on it, they may provide students with new choices that address the needs they

have voiced. This type of pivoting of course policies and procedures based on student choices

and feedback is not typical of the traditional rigid predetermined syllabus standard used by

faculty before the pandemic.

Proximity Safety

The second category in "It's Not in the Syllabus" is response to proximity safety.

Proximity safety refers to students' basic need to feel safe on campus and in the classroom.

Findings suggest the extended time using digital tools in VLEs provided participants with

solutions to continue practicing active learning strategies while taking steps to intentionally

protect student health and safety and acknowledge the need for proximity safety in the

classroom, even if it was no longer stated specifically in the syllabus. During the time spent in

VLEs, syllabus statements were focused on letting students know they did not need to turn their

cameras on. When students returned to in-person classes, VLE syllabus statements were replaced

with statements on physical distancing and wearing masks inside academic buildings and

classrooms. Once students were back on campus there was a desire to return to business as usual, but that was not how things were playing out in classrooms.

Some of the most impactful comments from participants interviewed were about health and safety concerns related to physical learning spaces. Many participants talked about the experience of returning to a physical classroom after the extended time in VLEs where students and instructors were asked by the university policy to wear a mask and physically distance and how this impacted their ability to use the active learning strategies they had used before. Parker was considering alternative ways students could engage with the course and how digital tools could provide that flexibility, not knowing why students might need it, but acknowledging that it was a basic need of all students:

Well, proximity and space were always a concern of mine. I think it still is to be honest with you. Even though I know we are pretty much going face-to-face now and pretty much most of our campus is vaccinated. It's still one of those things that are always at the back of my mind because COVID is still very highly contagious. So, I want to be thoughtful for the students that are still wearing masks for example, and to be considerate of the reasons they may be doing that I won't know about, others don't know about, but that's... it could be somebody at home… who is someone important… so that's always now thinking through providing alternate options like texting or using an online doc. Some way to facilitate the active learning and the communication that is so much a part of my normal classroom, but to be able to use technology to facilitate that rather than speech.

Ford shared how this had an impact on how close students were willing to sit to each other:

I think the students were also not comfortable, maybe sitting near people when they first

came back, that was another thing that I sort of noticed whereas before when they would

come into the class, they might have sat down with people and would talk to them. They

were very quiet. That was all different.

Mackenzie had a similar experience to Ford with proximity safety issues in the classroom

and it affected their ability to have students work together in groups effectively because they

would not always work closely together and they felt tentative about asking them to. Levy also

shared a similar experience and how it impacted their ability to communicate with students and

"work the room" while practicing their normal active learning strategies.

Many participants talked about how they changed the way they handed out materials in

the physical classroom due to health safety concerns. An interesting finding here is that

participants used digital tools they had learned to use during their extended time practicing active

learning in VLEs to replace physical papers and manipulatives being passed in class and to

address the concerns around health and safety and space.

Ford shared how handing out of materials and submission of assignments changed:

The other thing that was different in the active learning classroom where I previously

taught was I was very comfortable handing out materials to students, like handing out

papers, deliverables, or things they would work on. Now returning back, I was much

more conscientious about what I was handing out or giving out to them. Previously I had

done things like, take up index cards about a point they were confused about. Now I try to

make sure to do it with polling software. If they did a submission, I would take up a piece

of paper and it would be graded, now I would have them snap a picture and upload it to

the LMS and I grade it there so there were fewer physical materials being passed

between students. We did a lot of things that were laminated, they would get a piece of paper that might be laminated and they would look at it. So now if there's a case study that we would normally hand out we would just put a copy of that onto the LMS. That was a change.

De Souza also became aware of sharing of physical things in the classroom and how this affected student's proximity safety needs and made modifications:

I think just being conscious about sharing physical things because of the pandemic, try to minimize that as much as possible, using digital as much as possible. Before I would have pieces of paper and each team would get one. I now have that pre-created digitally and I say: Team 1 here's the link to your document, Team 2 link to your document and the QR code, a lot of QR codes, that is something that has changed a lot. So, many times I want them to use an online form or an online doc. I just make a QR code and it's easier in the physical classrooms to share those links through the chat and send it that way to minimize physical sharing of things.

Modena discussed continuing to use online shared documents with in-person classes as a way of providing healthy proximity safety for students. Saaranan changed participation rules for their active learning strategies, allowing students to choose to work individually if they were not comfortable working in groups, to make sure students' need to feel safe in the physical learning environment were met.

Participants found that upon returning to in-person classrooms they could not just go back to the way they had been teaching in ALCs before the pandemic. Proximity safety was in the forefront of everyone's minds and affected everything they could do in the in-person learning environment. Policies affecting safety and learning spaces were changing by the semester, but

students' feelings did not change with the academic calendar. Syllabi statements from the time spent in VLEs were quickly outdated, and statements about physically distancing and mask wearing were phased out as the UNC system dropped the mask requirement in academic buildings and other rules loosened around COVID-19 exposures and infections.

Flexible Arrangements

The third category in the "It's Not in the Syllabus" theme is the need for flexible arrangements surrounding life's basic needs. These needs were always present for students in higher education. Students got sick, people they cared for got sick, emergencies happened, issues arose with jobs and work schedules, financial distress occurred, people experienced mental health crises, students needed accommodations and supports. While there were processes in place for dealing with these situations' pre-pandemic, with standardized syllabus statements on what department you should email and what documentation you needed to provide, the impact on both students and instructors after March, 2020 was unprecedented. The extended time teaching in VLEs due to the COVID-19 pandemic created a major shift in academia's reaction to these life events. These events were more frequent, more normalized, and suddenly the instructor's response to life's basic needs had to be more flexible. Flexible in a way that could not be prescribed ahead of time in the syllabus. Participants in this study described how practicing active learning strategies in VLEs for an extended period of time increased the need for flexible and open lines of communication between the instructor and the student. Students were struggling with participating in the VLE for differing reasons. Ford captured several of these reasons through student reflection surveys as a way of finding out what their students needed:

So many, I had emails from students, you know things that had been going on in their lives with either being sick themselves or taking care of people who had been sick or having to pick up another job… I heard about the student drop in hours. I talk to students. I had all kinds of indicators, you know, that there were a lot of factors besides learning that were influencing how the students were doing. The reflections were a way for me to communicate with my students. Sometimes if they didn't feel comfortable sharing, because it was live on web conferencing software, they could just write me a short note: "I am really stressed out this week because I had to pick up an extra shift.

Ford also changed how assignments were submitted, how students were allowed to work, and created resources in case students missed class:

One thing I really changed was being a little bit more flexible with my students. That changed after being online, because so many students would miss class you know, I had students who had to be quarantined or isolated. I needed to be a little flexible in what I was grading at the moment so I think that changed. I didn't grade things as we were doing them; I maybe gave them a little more flexibility in their active learning assignments. I allowed them to submit assignments after class and to also work alone if they preferred that. The other change was that I had the recorded videos that I had made when we were online. I had those as a supplement to my face-to-face courses so if students did have to miss class, or they did miss the lecture, they could go and watch the recorded videos. I had that as a resource that I didn't have before. And the students really appreciated being able to go and re-watch some of the lecture.

Singh and Saaranan also reported addressed flexible arrangements from the standpoint of accommodating students who need to be absent or who needed extra time or additional resources.

Mackenzie brought up learning loss related to technical skills. There was an assumption that all faculty and students were digital natives and that even if the transition to VLEs and using digital tools for learning may be a little bumpy, it should be easily managed. Mackenzie cautioned there was evidence of learning loss related to technical skills during the time spent in VLEs. Despite everything collectively learned as a result of time spent online due to the COVID-19 pandemic, MacKenzie cautioned that "we should not assume all students are 'digital natives'":

> *Situational prowess that our students have with digital tools is really significant - and the number of people that struggled with trying to do sort of a basic assignment that involved opening a spreadsheet - and these were seniors... these weren't freshmen. There's a lot of digital tools that I stopped using because it was too hard or I was too worried.*

Flexible arrangements like the ones experienced during the COVID-19 pandemic are not something that was able to be captured clearly in the syllabus. They are, by nature, unexpected and a strategic response is needed to pivot and meet the needs of the students and the instructors. The syllabus, traditionally thought of as a contract between the faculty member and the student, has little consideration for faculty in the syllabus, other than standards that govern how they may support and evaluate students in their courses. The time spent in VLEs practicing active learning strategies led to collective exhaustion and some inconvenient truths about what was not addressed in the syllabus for the participants interviewed.

Inconvenient Hardships

The final category in the "It's Not in the Syllabus" theme is inconvenient hardships. The inconvenient hardships participants experienced due to a lack of structure and predictability for faculty are relatable to "It's not in the Syllabus" and could be called "It's Not in the Contract" or "Other Duties as Assigned" but the context is the same. Just like their syllabi, participants interviewed experienced a lack of predictability and structure, which led to feeling they were not properly recognized for their extraordinary efforts teaching in VLEs and promoted frustration with administration and feelings of burnout.

Inconvenient hardships are defined as experiences shared by participants about challenges they experienced while trying to practice active learning strategies in VLEs where they received little to no structured or prescribed support from their departments or the institution. Many of the scenarios participants shared were isolated incidents that did not affect a large number of students and thus did not warrant a response from administration. Other scenarios were simply situations that could not be managed for political, financial, or other reasons.

"Not in the syllabus" was support for faculty learning how to practice active learning strategies in VLEs for the first time. Levy shared how hard they had been asked to work over the summer (unpaid) to prepare for teaching in VLEs in fall 2020, and their feelings about the university's response to that:

> *It felt frustrating to me that I felt like the university administrators were just like, 'oh, just move online.' It's like saying; 'let's just change your seat at the table.' So, the summer reading, and I was really resentful, I'll be honest, because I am on a 9 months' salary, and I resented that on my time off, and I am not being paid, I have to do this work for this*

university I mean, I don't have to but who is not going to do that if they are not good teachers, come on. So, I even wrote the chair and I said, here's what I am doing and I am not the only one. What kind of compensation will there be for us, as I have to show you my stuff? And you know, she was like, there's no compensation. And I am like, keep it real. This is a big problem for lecturers on 9-month contracts because stuff happens in the summer and you just do it and you don't get paid and you know how that goes.

Modena did not think that faculty or administration realized how much work went into preparing to practice quality active learning strategies in VLEs effectively:

Talk about the time aspect of developing virtual learning activities, it takes a lot of time, at least to do it well. I think a lot of faculty did synchronous online and continued to do what they did in class, but just do it online, but if you really want to teach online effectively, quality... the behind the scenes development is much more time consuming. I don't think that was necessarily... I don't think we necessarily realized that as faculty. I don't think it was accounted for by the administration.

Support for the mental well-being of faculty was also "not in the syllabus." Carter bluntly shared their feelings about returning to a physical classroom only to be placed in a lecture hall for the majority of their classes, losing their access to teach in an ALC despite the hard work they had put in before and during the time in VLEs:

I would say that I'm burned out, I am really burned out, and coming back and teaching in a lecture hall classroom again, and the reason shoot, I didn't realize I was sensitive about this... It just seems the more you want to do, the more they want to burden you.

The COVID-19 pandemic created an inequitable arrangement where flexibility and support were abundant for the majority of students who could keep up with the technology, and

the same was expected of faculty, but with little reward or recognition and at the price of their goodwill in some instances.

Theme 3: Virtual In-Person Classrooms (VIPCs)

The theme of Virtual In-Person Classrooms (VIPCs) came from participants' shared stories of returning to the in-person classroom after the extended time practicing active learning in VLEs and finding that the way they had practiced active learning strategies in ALCs and physical learning environments had changed. Student access to technology, combined with digital tools learned in VLEs, and in-classroom norms had transformed physical learning environments. VIPCs take the best of the ALC and the best of the VLE and create new learning spaces with more flexibility.

Questions from the semi-structured interview guide that informed this theme were: 1) How did your use of active learning strategies change from the last time you had used them in an ALC? 2) Did your experience teaching in virtual learning environments influence how you now practiced active learning strategies? 3) How did embedded technologies in the classroom play a role in your use of active learning strategies? 4)What active learning strategies did you use for the first time in virtual learning environments that you continued to use in physical face-to-face classrooms? 5) Is there anything else you would like me to know?

To understand this theme fully, it has been organized into categories of experiences and actions shared by participants during their interviews. The categories that make up this theme include: one-to-one laptops, online in the physical classroom, and all classrooms can be active. These categories provide a thick description of how the experience of practicing active learning strategies in a VLE for an extended period of time influenced how active learning strategies are practiced now.

One-to-One Laptops

The first category in the VIPCs theme is one-to-one laptops. All of the participants interviewed mentioned student access to laptops. Prior to the pandemic, a key feature of the first two ALCs at UNC Charlotte were the laptops that were embedded into the table pods. These leveled the playing field for student laptop access when working in these rooms and contributed to active learning strategies leveraged. Modena explained how they had groups work together sharing the laptops to do simulations pre-pandemic:

So definitely in the ALC with the students having access to laptops, I typically had students work in teams of three and so they would share one laptop per team. I would use the laptops to use simulations on our subject matter – just by nature what it is, it is often hard to visualize what we are talking about, so there's a lot of great simulations out there nowadays to help with that.

After the pandemic, participants reported that the majority of students had a laptop, or some other smart device in the classroom, and this made using digital tools easier. Saaranen shared:

Now everyone brings their computer, and so I can say: 'We are going to do this activity, step one is for you to turn around find a group of three people and create a digital whiteboard with this particular prompt.' And then after everyone does that, we can stop and get everyone in the classroom (which is a nice piece) and we can talk about it and we can do some "Think, Pair, Shares" and then we can say... instead of going around and looking at everyone's boards, we can hop back on that digital whiteboard and scroll over and see what people came up with for this particular piece. It does make the active learning and group work easier. Does that make sense? (Laughter)

Carter explained about the new normal of ubiquitous smart devices and laptops: "And then the smart phones and everybody seemed to have their own laptops, so that ended up kind of working better."

The extended time in virtual learning environments led to students needing to have laptops. Either they acquired them due to departmental requirements or through the laptop checkout program offered by the library. Several faculty including Levy and Singh noted that all students seemed to have laptops after returning to in-person classes. Mackenzie shared how students having laptops took pressure off them focusing on everyone having the right type of access to devices and allowed them to focus more on implementing active learning strategies and trying new digital tools:

It really... to my way of thinking, it really freed me, because I was so much less worried about: 'I really want to explore this digital tool, but if I do that then who has got laptops, who has got access to this, who can see it?' It could become a real strain, and that was way before we had laptop policies uniformly across campus. And even people who have laptops, some of them are behemoths, that you know, have to be plugged in all the time because they can't afford a new battery, you know, all that kind of stuff. So, it really freed me to be able to think about using digital tools and that influenced the kinds of things that I was doing, and not just for projects, but also for things like having students respond to you know, finding different ways to do responses for readings; trying to get people to read but not the same 'we are going to have a quiz on it' kind of thing....and then the modification is using student laptops to share digital products.

Singh also shared how students with laptops helped to facilitate active learning strategies in an ALC with digital displays:

Again, the fact that they were able to connect their laptops to the monitor at their local table was very helpful because I have a lot of activities where they are solving a problem and putting answers into a table or a chart of some sort.

Saaranan shared how an activity that a QR codes pre-pandemic was able to be modified to be supported by computers alone due to the one-to-one laptop ratio. Saaranan noted that, while not every student had a laptop, they did all have smartphones:

A lot of what we did, too, when we came back from the pandemic, used computers, so again previously not everyone brought a computer. So, like for example, that same activity I told you about when we did it before the pandemic, we had QR codes on that sheet of paper where they could use their phone, scan the QR code and it will bring up the graph. We removed those, because coming back everyone brought the computer with them. It was kind of pointless to have the QR code when they can just type in the address in their computer. With that in mind we did design more activities where they would be using data repositories on the internet for example. There were a lot more skills based on treasure hunting like 'can you find this data on this website?' Are you comfortable navigating the dataset to look up statistics about a particular subject that we are learning about. So that was actually a benefit just because we could incorporate new types of activities that were different from before.

Modena said, "Certainly, students have laptops, definitely now more so..." The experience of practicing active learning strategies in VLEs for an extended period of time influenced students' access to laptops upon return to physical classrooms and this in turn broadened faculty options for how active learning strategies could be practiced in-person, which leads to the next category; online in the physical classroom.

Online in the Physical Classroom

The second category in the VIPCs theme is online in the physical classroom. Participants returning to physical classrooms, ALCs or other, brought with them the experience of teaching in VLEs using digital tools for an extended period of time. It makes sense that many of those tools learned would transfer to the physical space. Participants found themselves teaching in physical classrooms using the digital tools they had been working with in VLEs. Saaranen shared the impact of their overall experience and how they applied to all learning environments they taught in now:

> *I would say yes. Yeah. I think I learned a lot honestly teaching virtually for two years, and you know I am still teaching online, so I still have kept one section online asynchronous just as I have been teaching it throughout when we were all virtual because I feel like a lot of the things that I implemented online worked in the classroom too.*

However, Saaranen also shared how the transition from ALC to VLE and back to ALC was a bit jarring:

> *It was a lot easier in the active learning classroom to do that stuff, you know, it's kind of like a little journey, I was doing things in this active learning classroom where I was able to do a lot more. And in the virtual environment, it's a lot harder, and you have to figure out ways to get people to work together, or try to incorporate things like a "Think, Pair, Share" when everyone's, you know, in different places at different times. And then you come back to teaching and you are in this classroom that is almost like the virtual learning environment because there's so many students, and you have people in the front, people at the back, and you can't do what you were doing previously. You can try to*

block off rows and walk around but it is not going to be the same, it's just a little band aid kind of.

Similarly, Mackenzie expressed that the time in VLEs had inspired them to use more digital tools and to organize their course content strategically when practicing active learning strategies:

The virtual environment has taught me that to really do the best work that I can, it's got to be planned, sequenced, appropriately scaffold and then launched into the world, and not just sort of launched and then we fix those things afterwards.... So that is what I'm trying to work on doing going forward in all of my classrooms, especially in these ALCs. So, and it's also rejuvenated my interest, not just my interest, but my belief that it's absolutely crucial that we use more digital tools, more intentionally and thoughtfully. So digital whiteboards are the first thing that comes readily to mind. I'd never really used those before and I found that even in a face-to-face class they were great to use, not only because they are captured and I don't have to do all those crazy things that we have to do in order to capture it, but you know they were just really easy to kind of launch – what I call an engagement question, it's just like you know the hook, and so maintaining that is something that I brought in...

Carter still uses digital whiteboards in physical classrooms as a way for students to communicate and give feedback on how the class is going, even though the classroom has physical whiteboards in it. Modena also began using digital whiteboards in the physical classroom and in in hybrid classes as well:

Actually, I just did think of something that I was introduced to during our virtual time that I continued to use... So, digital whiteboards, you know, I had never used that, I

started to use that or even just shared online documents just a way for students to capture

the team working together, what their team response was. So, I definitely started to use

that, even when I was using the hybrid format, I continued to use those technologies.

Levy also found it interesting that they were using digital whiteboards in the physical

classroom as well as part of one of their active learning strategies:

You know what was interesting is I did incorporate some of my online things like digital

whiteboards, which you know, I didn't use before the pandemic. I wonder if this is what

you are curious about, so the crowd sourcing was great, so we did it on the shared online

document and again anonymously. You just come in and write underneath, whatever

comments, ideas, questions, thoughts you have about that person's question... now that I

did again in the classroom, so we did this online but we are in the class doing it. So that

was something I definitely brought over. I would have never thought I could. In my brain

it was like online teaching and in person teaching are black and white. I would not have

thought, seems kind of weird to say this, but I wouldn't have thought I would learn

something online that year that I could definitely bring back into my face-to-face. I would

have said no, that's impossible before. I still prefer in-person for all the reasons I've

said, but you could definitely do good stuff online for sure.

When questioned further, Levy shared that student laptops had replaced the digital

displays in their ALC and they were contributing to engaging conversations and had embraced

more digital tools while still using some of their old standards as well:

Now they wouldn't put it on that monitor, but somebody would show me, they would turn

their computers and we are going to talk about this, this and this... so it just made it, it

made me able to be more involved in their learning as it was happening. I think I did do

more digital things when I came back to the in-person classroom like digital white boards

for example and just taking advantage of good digital platforms that will help us advance

what we are trying to do that day. And things that before I would have a little more 'old

school,' you can still do it that way but there's... everybody can come at the board and

write stuff but it is also quicker and really cool, they like seeing digital white boards with

their colorful post-it notes and stuff like that. That kind of digital space where the

feedback is crowdsourcing.

Saaranen shared how many of the digital tools they are using in physical classrooms to

practice active learning strategies they learned from the ALA FLC at UNC Charlotte:

A lot of the tools that I discovered over the pandemic that I had never previously used I

still use now. So, I think a lot of them were useful and very convenient for the students

and I still continue to use those tools and you know a lot of them I learned about from

other people. In the Active Learning Academy, they would do those workshops with some

of the things that they had been using. So, I did learn a lot from that, it was super helpful.

I definitely do that, I definitely use different tools.

Ford increased their use of online submissions and polling activities in the physical

classroom as well as included digital whiteboards in their active learning strategies:

I try to do a lot of things electronically. Utilizing more online materials submissions. I

did go back to using polling software in terms of, you know, engaging students

throughout the class finding out where they are at in understanding, sort of check in.

Before we had used things like sequencing projects where they put things in order so

there's a little thing they have to solve so I would give them a physical piece of paper

before, now I might do it on a digital white board. So, they do the same activity but with a

different delivery.

Parker simply stated: "All of those things that I found were effective in the virtual space, I was able to transfer them to my face to face class."

Singh linked the use of digital tools in physical classrooms with clear instructions to an increase in student engagement in the physical classroom, a challenge cited earlier in the study when returning to physical spaces:

Some of the things I learned during virtual teaching is how much technology like online

shared documents and so on can help. Even if it's something they are doing on paper,

having a document can help everyone participate, share their thoughts or even share it

out with me or with the class. I continued to use some of those things after coming back

as well. Even though they are all physically sitting in the same classroom, they are

talking to each other; there is still an advantage to putting things into an online shared

document or some similar thing so I continued to use those. Like I already said, I did

think about other ways of engaging students more in those activities.

De Souza talked about once returning to the in-person classroom they could feel that students wanted to use the chat feature to ask questions instead of raising their hands, so they came up with an in-class solution:

So, I utilized the back channels, like the discussion forum would be open and I would

assign my TA to monitor that. So, if students wanted to ask a question rather than raising

their hand, they could also ask it asynchronously in a chat even though we are in a

physical classroom. I think that is something I brought from the pandemic, or from the

virtual to the classroom, that I didn't have before. In the beginning it was something I

didn't use before, I used it in the virtual to make sure students are talking and sharing

and I continue using it in the physical classroom.

De Souza sums up this category and talked about the balance of choosing the right tool for the right teaching strategy. In VIPCs that sometimes means leveraging the digital tools learned from the time teaching in VLE:

A lot of the things that we do in the digital classroom had to kind of translate in the

physical classroom, and in terms of that, they had to collaborate with tools, right? If they

needed to work on something together we needed to have a collaborative tool that

allowed them to do that, right? Again, the shared online documents came in the picture,

the digital whiteboards in the classroom to allow them to collaborate and do this like

that...

Discussion about challenging learning spaces (theater style lecture halls, stadium seating classrooms, traditional fixed seating classrooms) were also addressed. Participants talked about students having one-to-one laptops, and participants speaking freely about the ability to leverage the digital tools they learned to use in VLEs in ALCs and physical classrooms. It could be easier now to try and practice active learning in these rooms. The advancements from the extended time spent in VLEs could extend and make all classrooms active to some degree.

All Classrooms Can be Active

The final category in the VIPCs theme is that all classrooms can be active. This category examines participants' statements about the challenges of teaching in stadium style and lecture hall classrooms, as well as some fixed seating classrooms. It also looks at statements they made about how the VIPC theme transferred over to these learning spaces and how other categories including one-to-one student laptops or digital tools learned from practicing active learning

strategies for an extended period of time in VLEs have translated to these challenging learning spaces.

Several participants, including Ford and De Souza, shared the limitations of practicing active learning strategies in large lecture halls and theater style classrooms and how important it was for them to be in an active learning classroom pre-pandemic. Modena talked about how the learning space itself conveys a message to the students about what type of learning is about to occur, and lecture halls do not inspire active learning buy-in from students:

You know one of the challenges with active learning and getting students to buy in. As you walk into a lecture room, lecture hall, so just having an environment where it's obvious from day one to students you know, you're probably going to be talking to each other, and so it was the environment, it's having a classroom that supported the student-centered strategies was what I think made all the difference to me. Can you do active learning in a lecture hall, of course, people do it, of course, I think that active learning strategies will become more prominent and more of the expectation instead of the atypical environment. I think we need to help sell it to students as much as possible. And then certainly it's much easier to implement if students can easily talk to each other and yeah, be able to look at the same paper, all be able to talk and hear each other. I think that is very important.

Mackenzie believes it is possible to do active learning in any environment but finds it challenging to imagine how to do it successfully with purpose:

And so, on the one hand I agree with this thing that says you can do active learning in any environment. You can. But can you do purposeful high impact active learning in any space, then I don't think so, and that is like a mind shift for me.

When Carter was put back into a lecture hall they reverted to lecturing with some guided attempts at active learning strategies:

I would say when I was in a lecture hall I reverted back to lecturing or maybe leading them through an activity but me talking at my students. Particularly when you teach a large class it's lecture style and is not going to work well. So, I had introductory courses, they gave me two of those sections, like 200 each in the lecture hall, and it was a disaster.

Not every participant had a negative experience in non-active learning classrooms however. Saaranan articulated how digital tools were used when stuck in a challenging traditional classroom:

I feel like a lot of the things that I implemented online worked in the classroom too, and sometimes they made it easier especially teaching in a non-active learning classroom. Some of the things that made students able to work together virtually, it's still stuck in that classroom, it made them able to work near working together as a class even though they couldn't get up and walk around. So, I think a lot of the things I learned from like trying to keep people together even though we were virtual kind of worked in that classroom too. We are not virtual but we are also spread out in that class, so some of the techniques in the things that we were using virtually still apply in that particular setting. A lot of the things that were identified during the virtual teaching that allowed me to help keep people working together, like I just continued to use in that particular classroom because I am still teaching in that classroom now. I've learned things that can be done virtually, that can still be done in the physical classroom, that make active learning easier, even if it's not an active learning room. I don't think I would use a digital

whiteboard in an active learning classroom, but if I'm stuck in that lecture hall, that's

something that I can use.

Saaranan's example is one of the most creative stories shared. Saaranan explained that students were sitting in a lecture hall, accessing a website, looking up data, all following an active learning assignment in groups that were based loosely on who they were sitting around. Each group had a different piece of information and each group ultimately had to share with each other. Saaranan encouraged students to turn and talk but to also use digital tools like online shared documents, cell phone cameras, texts, AirDrop, digital whiteboards, and other ways of sharing the pieces of the activity with each other. In the end, to be successful, each group had to share their work with every other group, and using laptops, smart devices, and digital tools, Saaranan was able to guide students stuck in fixed seating through this active learning activity successfully. Saaranan's comment about this experience exemplifies the idea that all classrooms can now be active with the right mindset and skill set:

> *Yeah, you know, in that classroom coming from someone who will always do active*
>
> *learning in my classroom, like it doesn't matter if it's in an active learning classroom*
>
> *where it is easy to do, or if it's in that giant lecture hall where it is very difficult to*
>
> *accomplish, like it is going to happen, and so the way it happens will be different, you*
>
> *know the way students will interact with each other will be different, but it is going to*
>
> *happen, right?*

While many of the participants returned to in-person classrooms, just as disillusioned with lecture halls, theater style classrooms, and traditional classrooms as they were before, several recognized that the skills they had gained practicing active learning strategies for an extended period of time in VLEs had provided them with new tools for managing these

challenging spaces in new and creative ways they had not imagined. The emergence of a new learning space, the VIPC, marries the best digital tools used in VLE and the best space management arrangements for group work with active learning strategies to create a flexible learning space that provides new opportunities for practicing active learning that are still being developed.

Summary and Transition

The purpose of this chapter was to present the results of data collection from 10 participant interviews in this exploratory descriptive case study seeking to understand the experiences of higher education faculty participating in a faculty learning community (FLC) focused on practicing active learning strategies throughout an evolving pandemic to discover how the increased use of virtual learning environments impacted the specific faculty's use of active learning strategies in physical classrooms. Based on their shared stories and experiences three themes were identified: Working the Room; It's Not in the Syllabus; and Virtual In-Person Classrooms (VIPCs). Within these themes, nine categories provided additional context that addressed the research questions. In Chapter 5, the researcher will connect these findings with the literature, summarize conclusions, and offer recommendations for future research.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

The purpose of this exploratory descriptive case study was to understand the experiences of faculty learning community (FLC) members practicing active learning strategies in virtual learning environments (VLEs) to discover how teaching in virtual spaces for an extended period of time impacted the use of active learning strategies in physical classrooms. This researcher explored and described the unique phenomena experienced by study participants through related literature on learning spaces, active learning, and faculty development. In addition, data were analyzed through the lens of a theoretical framework of change management and a conceptual framework for designers and users of learning environments. These frameworks support the research questions guiding this study and extend the findings.

The research questions guiding this study were: 1) How did faculty learning community members practice active learning strategies in virtual learning environments? and 2) How did the experience of practicing active learning strategies in virtual learning environments for an extended period of time influence how active learning strategies are practiced in physical classrooms? This researcher conducted semi-structured interviews with 10 faculty members from the case study institution; the interviews revealed three overarching themes about practicing active learning strategies in VLEs and subsequent changes that emerged when participants returned to physical classrooms: (1) Working the Room (2) It's Not in the Syllabus (3) Virtual In-Person Classrooms (VIPCs). These themes provided insight into participants' experiences and answers to the research questions. This chapter includes discussion of findings based on each research question, as well as implications, recommendations, and a conclusion.

Discussion of Findings

The two research questions guiding this study focus on how seasoned practitioners of active learning approaches practiced active learning strategies in VLEs and how the extended time they spent teaching online due to the COVID-19 pandemic influenced their teaching practice upon return to physical classrooms. The three themes that emerged were rooted in participants' successes and challenges reconciling the changes they experienced moving from teaching in physical spaces to virtual spaces and then to physical spaces that were different from before.

Theme 1: Working the Room

Theme 1: Working the Room, answers RQ1: How did faculty learning community members practice active learning strategies in virtual learning environments? Findings from this study supported existing research that shows instructors must match pedagogical practice with the learning space to achieve success with active learning (Beichner et al., 2007; Lasry et al., 2012; Lasry et al., 2014). In addition, findings from this study support Thibaut and Schroeder's (2020) and Christianson's (2020) findings that faculty overwhelmingly engaged students in active learning strategies during the COVID-19 pandemic by:

- retaining their original course learning objectives and delivering them through online cloud-based technologies,

- condensing course content for online consumption,

- creating opportunities for collaboration through breakout rooms and other web conferencing tools, and

- leveraging online polling software to maintain real-time student participation.

The model participants largely reported using was to replicate what they were doing in physical active learning classrooms (ALCs) in VLEs using digital tools. This aligns with Hasnine et al.'s (2020) model connecting traditional in-person classroom active learning strategies with online digital tools that could be used in VLEs.

The theme "working the room" highlighted important aspects of participant experiences using active learning approaches and strategies in ALCs and in VLEs. Looking at ALCs through the lens of Radcliffe's (2009) Pedagogy-Space-Technology (PST) framework, Zuu and Basdogan (2021) found that the ALC was perceived to be a more flexible learning space where groups could freely move around and communicate. Participants were already familiar with how to maximize the use of active learning approaches (i.e., problem-based learning, collaborative learning, cooperative learning) in their ALCs but encountered challenges in VLEs. This is not surprising given that these approaches and strategies were developed with physical classrooms in mind and the online, virtual space was not necessarily taken into consideration in their original design.

Unlike in Bybee et al.'s (2006) work highlighting examples of implementing active learning strategies and Chi and Wylie's (2014) work showing the modes of behavior that engage and support active learning, participants in this study learned those models were not as easy to implement in VLEs because the learning environment was not a contributing factor in the design. Working the room highlights how participants adapted those models for practicing active learning strategies to fit the new environment. The model that had the greatest potential for transferring into the VLE was Radcliffe's (2009) PST framework shown in Figure 7.

Figure 7

Radcliffe's (2009) Pedagogy-Space-Technology (PST) Framework
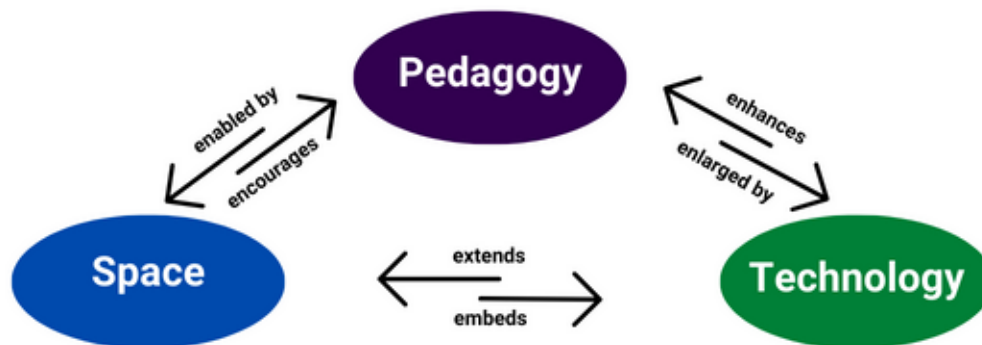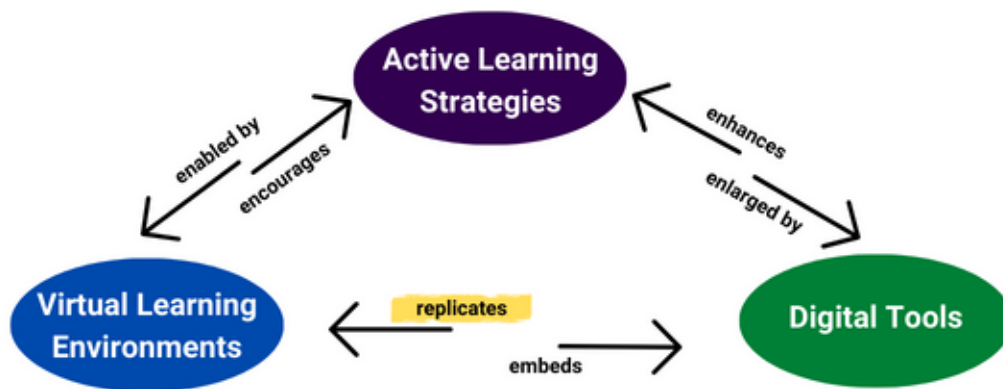

Note. This graphic shows Radcliffe's (2009) Pedagogy-Space-Technology (PST) framework and how each element interacts and influences each other.

Radcliffe's (2009) framework is a model that extends beyond the pedagogy of active learning approaches and strategies and considers other key contributing factors including the learning environment (space) and technology. Lee et al. (2018) found that when practicing active learning through the lens of Radcliffe's (2009) PST framework, technologies must be carefully considered with relation to the space to accommodate activities. Participants in this study found that even with alignment in the aforementioned areas of the model, experiences practicing active learning strategies in VLEs required modifications to the PST framework because the model was still designed with the physical classroom in mind, specifically ALCs. Figure 8 shows a modified version of Radcliffe's PST framework that emerged from this study.

Figure 8

Radcliffe's Pedagogy-Space-Technology (PST) Framework Modified for Study Participants

Note. This graphic shows Radcliffe's (2009) Pedagogy-Space-Technology (PST) framework modified based on participants shared experiences.

In this modified version, the PST elements of the model are purposefully updated with the key elements participants in this study experienced. Pedagogy was specified as active learning strategies, technology was specified as digital tools, and space specified as virtual learning environments. In addition, the word "extend" has been replaced with the word "replicates" to illustrate the nature of the unique relationship described by participants between technology (digital tools) and space (VLEs). Instead of technology extending space (as in the original PST framework), participants reported using technology to replicate the space, in an attempt to recreate the ALC.

Lee et al. (2018) found that for active learning strategies involving group work to be successful, faculty must first engage students in short lectures and class-wide discussions that framed the learning content. Participants in this study used a similar approach when trying to

engage students in VLEs in active learning strategies using web conferencing software and breakout rooms with mixed results. Thibaut and Schroeder (2020) found that in VLEs the instructor served as the facilitator for these teaching strategies by joining breakout rooms, answering questions, clarifying directions, and monitoring chats and emails. The theme of "working the room" illustrated how essential it was in VLEs for the faculty member to connect the learning content, the VLE, and the technology for the students. An addition to the modified PST framework is the inclusion of an engaged facilitator, represented by a red triangle in the center of the model shown in Figure 9.

Figure 9

The Facilitator's Role in Radcliffe's (2009) PST Framework
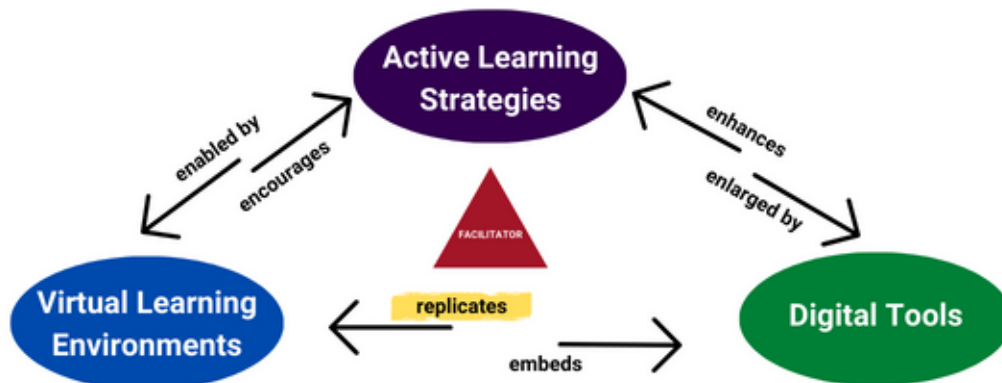
Note. This graphic shows Radcliffe's (2009) modified Pedagogy-Space-Technology (PST) framework with the addition of the facilitator and their role shown as central to the framework's operations.

In VLEs, the space alone does not encourage and inspire the pedagogy in the same way physical ALCs do. The facilitator, instructor, faculty member, must work to replicate familiar elements of the ALC that will cue and provide access for the students to engage in active learning approaches and strategies online. Thus, the addition of the facilitator to Radcliffe's

(2009) PST framework is recommended for this model to accurately represent the experiences of participants practicing active learning strategies in VLEs.

Participants who reported the easiest transition to VLEs were using a combination of synchronous and asynchronous modes of delivery, employing the flipped classroom virtually, as Moorhouse (2020) found to be the most popular modes of teaching in VLEs during the early transition due to the COVID-19 pandemic. Even though well-known studies by Chickering and Gamson (1987) and more recently Freeman et al. (2014) have codified that students learn best through active learning approaches and strategies, a few of the participants interviewed struggled at first under the pressure of the overnight move to teaching fully online in VLEs and returned to familiar and less effective teaching strategies like lecture. However, a larger majority of participants interviewed found the transition to be easy because of the way their courses were already organized for active learning practices.

Similar to the current study, Oyarzun and Martin (2023) found that the facilitator plays a key role in group formation, activity design, and driving student engagement during collaborative teamwork. Facilitators who were able to successfully practice active learning strategies in VLEs had something special that encouraged students to actually engage with one another and the facilitator. For the purposes of this study, this researcher will call it the "spark." Gopal (2022) found that facilitators needed to help students become aware of three spaces they were engaging with in the VLE: the mental/intellectual space, which comes with distractions, the physical space the student is presently in, and the virtual space of the LMS or web conferencing software. Gopal found that the power of the instructor's voice could help influence, focus, and motivate students in VLEs. Similar to Oyarzun and Martin (2023) and Gopal (2022), findings from this study explained how the facilitator's "spark," as shown in Figure 10, came from the

organization of their course design in conjunction with their attention to the three elements in

Radcliffe's (2009) PST framework to actively motivate and engage students in collaborative

active learning strategies in VLEs.

Figure 10

The Facilitator's Spark
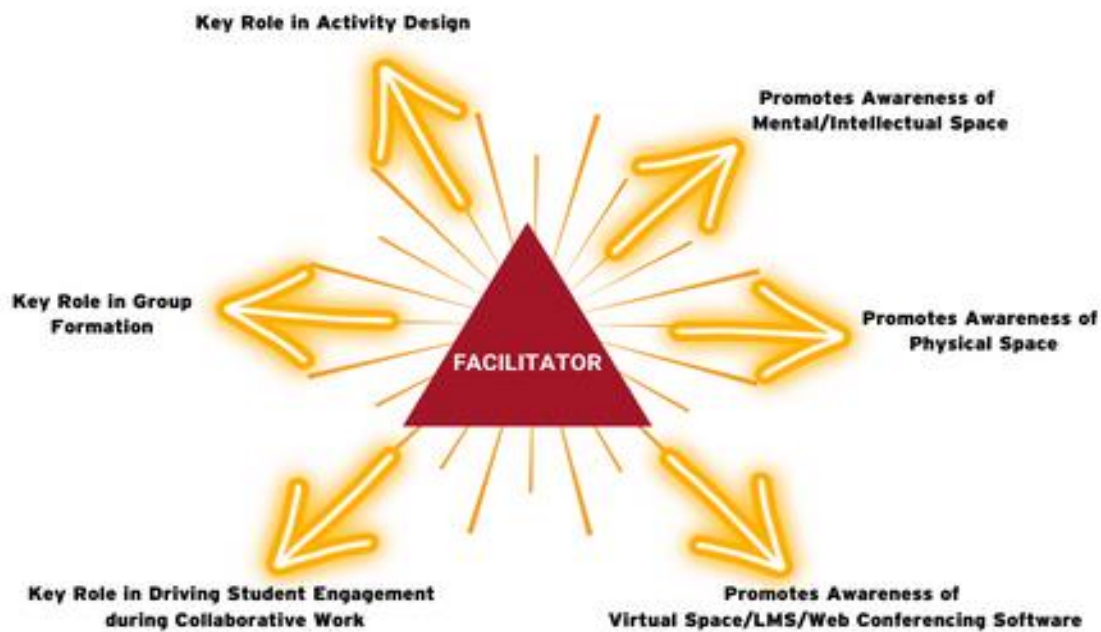
Note. This graphic illustrates the importance of the facilitator's role in practicing active learning

in virtual learning environments (VLEs).

Baepler et al. (2016) highlighted how innovations in technology would be what made the

replication of ALCs in VLEs possible in the future which concurs with this study's findings.

Digital tools and online technologies were what study participants reported using to replicate

elements of the ALC in VLEs and to create what this researcher calls the virtual reality active

learning classroom (VR ALC). The space where the three elements of the PST (pedagogy, space, technology) framework overlap represent the VR ALC as described by participants in this study and is illustrated in Figure 11.

Figure 11

Virtual Reality Active Learning Classroom (ALC)
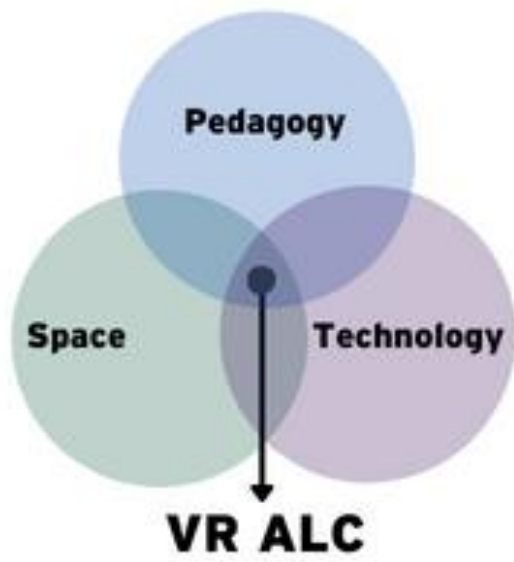
Note. This graphic shows Radcliffe's (2009) PST framework as a Venn diagram.

Rapid experimentation and adoption of digital tools used to practice active learning strategies in VLEs led to the creation of the VR ALC. Findings from the analysis of participant interviews in the theme of "working the room" showed that in order to successfully practice active learning strategies in in virtual learning environments (RQ1), you needed to: 1) replicate the ALC in a VLE by creating a VR ALC, 2) ensure the elements of the VR ALC were facilitated by a live person (the instructor) who is provided with adequate time and planning to deliver online courses, and 3) there had to be something special about the facilitator that encouraged students to engage with one another in VLEs, the "spark." Course design for active

learning approaches and strategies takes adequate time and planning on behalf of the facilitator, something not every participant was afforded before the COVID-19 pandemic and was reported by participants as something that was not granted during the rapid move to VLEs. The conditions necessary to practice active learning in VLEs successfully as reported by participants are illustrated in Figure 12. If any of these elements was out of balance in VLEs, participants reported experiencing "inactive classrooms" where students turned their cameras off, did not engage in group work, preferred to work individually, were silent in breakout groups, and/or did not attend class regularly.

Figure 12

Conditions for Successful Practice of Active Learning Strategies in Virtual Learning Environments (VLEs)
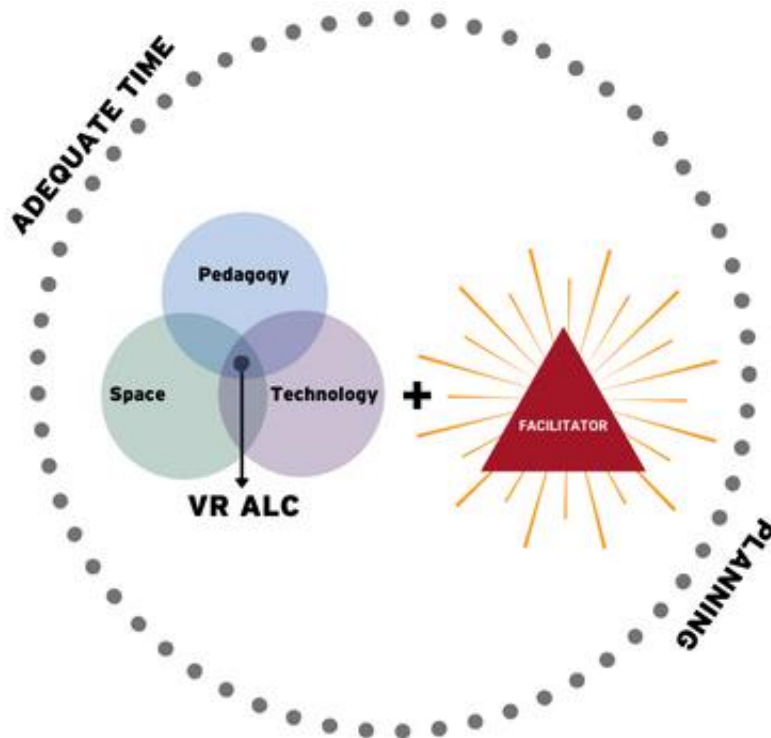
Note. Illustration of the ideal conditions reported by participants for successfully practicing active learning strategies in virtual learning environments (VLEs).

The researcher concluded that practicing active learning strategies in VLEs was no small task and participants described being in a constant cycle of learning about and trying out new digital tools that could help them practice active learning strategies online. Pressure from the institution to make supportive changes on-demand as needs were identified, to "pivot", also led to constant change. Lewin's (1947) 'changing as three steps' theoretical model of change aligned with participants' experiences, but only up to a point. The first two parts of Lewin's (1947) model, "Unfreeze" and "Change" were happening almost simultaneously due to the nature of the global pandemic and the state of emergency participants were functioning in. The time between identification of the need for change and implementation of change was drastically reduced. Notably, Lewin's (1947) model was linear, and had a refreezing phase that did not appear to be occurring for participants as seen in Figure 13.

Figure 13

Lewin's Changing as Three Steps (CATS) Model Modified for Study Participants

Note. This graphic shows Lewin's (1947) Changing as Three Steps (CATS) Model as experienced by participants in this study, with the "refreeze" step not occurring, and the model restarting after "change".

Changes were not stabilizing and celebrations of success were not occurring as was noted by participant statements in the section on "inconvenient hardships." Using the findings from this study the researcher proposes an alternate model of Lewin's 'changing as three steps' model that

is cyclical and involves two steps: unfreeze and change. This new model, reflected in Figure 14, has persisted throughout the writing of these findings and is likely responsible for the reported feelings of burnout and frustration expressed by participants and the greater issues found in higher education including "The Great Resignation" (Vinson, 2022).

Figure 14

Reimagining Lewin's (1947) Change Model as a Two-Step Cycle
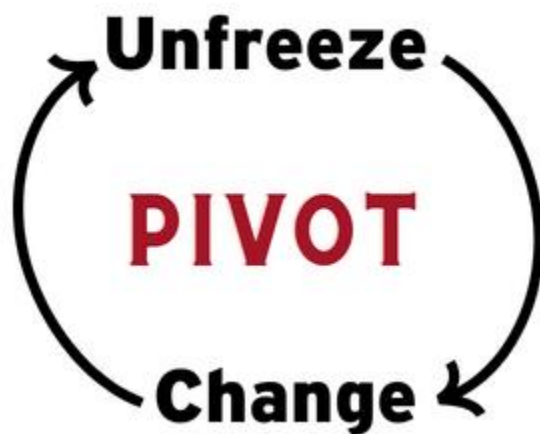
Note. This model illustrates Lewin's (1947) change theory as cyclical, moving rapidly between the "unfreeze" and "change" steps and repeating over and over in what became known as the "pivot" during the COVID-19 pandemic.

Most participants in the study adjusted to this cycle, but comments from the analysis show that it was not easy and that the pace led to burnout. In one participant's case, after one semester of teaching in VLEs, they chose to request an accommodation to teach in-person, on-campus, in large, physically distanced classrooms, because they could not adjust to the rapid pace that was required from this model of change.

Prior to the experience with VLEs shared by participants, research on distance education classes found that they were popular due to their flexibility, but also could cause student issues

with feelings of isolation, time management, self-direction, and decreased motivation (Jeong et al., 2019). Participants reported all of the above issues as challenges of practicing active learning strategies in VLEs for an extended period of time.
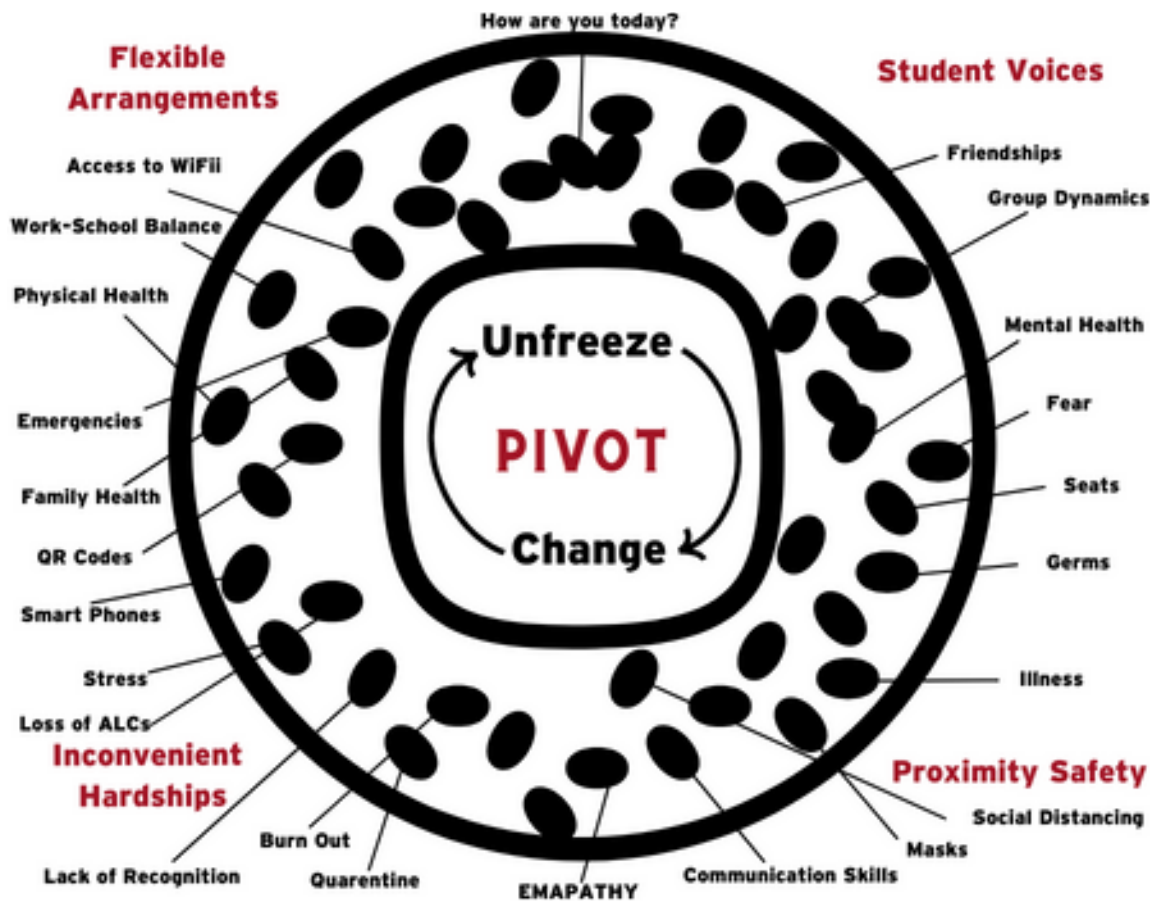
Theme 2: It's Not in the Syllabus

Theme 2: It's Not in the Syllabus, directly speaks to RQ2: How did the experience of practicing active learning strategies in virtual learning environments for an extended period of time influence how active learning strategies are practiced in physical classrooms? The accelerated paradigm shift, with a forced "pivot" overnight, and a rapid introduction and hasty adaptation to digital tools, offered an opportunity to transform and disrupt higher education, leading to accelerated growth and change (Nepal & Rogerson, 2020; Ozadowicz, 2020; Tan et al., 2020). The use of the "pivot" was the only way for faculty to provide the flexibility needed by students and requested by university administration. Bonk (2020) called it the "Brave new world of teaching and learning" (p. 596).

Findings from this theme include the presence of: 1) flexible arrangements; 2) student voices; 3) proximity safety, and 4) inconvenient hardships. In the revision of Lewin's (1947) change model, higher education has been permanently changed by the COVID-19 pandemic, and there is no "refreezing" step where changes are stabilized before newer changes are brought on. Developing ways to sustain the change is irrelevant, as the next change is right around the corner. Individuals must only look at the recent rise of artificial intelligence (AI) tools in higher education, such as Chat GPT, which acquired over one million unique users the first week it was released, and other competitors that arose rapidly only weeks later, to see how fast the "pivot" is occurring across academia with regard to digital tools and teaching and learning practices (Chrisinger, 2023; Lund & Wang, 2023).

Much like the "everything bagel" in Daniel Kwan and Daniel Scheinert's 2022 Academy Award winning film, the character Joy/Jobu puts everything that overwhelms her on a daily basis into and onto the bagel, no matter if it makes sense for it to fit there or not. Like the bagel, adaptive changes in higher education are NOT in the syllabus (author's emphasis), they are "*everything, everywhere, all at once*" (James, 2023). Participants expressed feeling uncertain and affected. Examples of all the situations and scenarios from participants are represented as the sesame seeds on the bagel illustrated in Figure 15, an unstable and unpredictable revision of Lewin's (1947) change model, and the opposite of the traditional syllabus.

Figure 15

It's Not in the Syllabus – A Revision of Lewin's (1947) Change Model for Higher Education

Note. Examples of conditions "not in the syllabus" reported by participants that carried over from practicing active learning strategies in VLEs for an extended period of time into physical classrooms overlaid with a revision of Lewin's (1947) change model.

Similar to Mshigeni et al.'s (2022) findings that students valued school-life balance, clear communication, resources, and empathy from instructors, participants reported an increased need to provide flexible arrangements with a focus on school-life balance in order to successfully practice student-centered active learning strategies in physical classrooms after the extended period of time spent in VLEs. Student voices and needs, captured through an unprecedented collection of feedback, continued to drive rapid changes in classrooms. Also similar to Kireev et al.'s (2019) findings, assuming all students were ready for online learning was a mistake, and many students still needed instructor assistance to be successful and not all students were as tech savvy as they were assumed to be or had access to reliable internet computers.

Vinson (2022) described the experience people felt as "the struggle" and cites that years of living with fear of infection from the COVID-19 virus, political unrest, mass shootings, and racial injustice are all factors that caused it. Findings from this study supported that the **struggle is real** (author emphasis) and that in order for students to be engaged in physical classrooms and practicing active learning strategies that depended heavily on group interaction, they needed to feel safe in the space. A revision to Radcliffe's (2009) PST framework may need to add the word "safe" to space going forward as illustrated in Figure 16 to reinforce how important this is to students in the era of education we have moved into.

Figure 16

Safe Spaces in Radcliffe's Pedagogy-Safe Space-Technology (PSST)
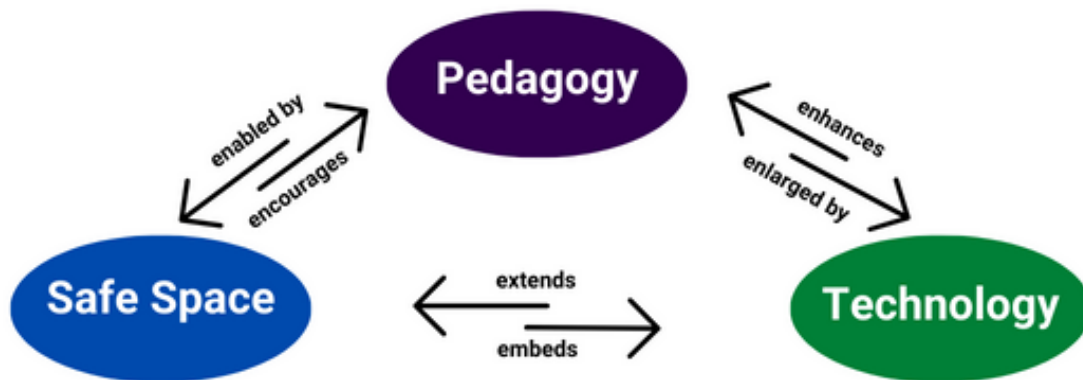
Note. A revision of Radcliffe's (2009) Pedagogy-Space-Technology (PST) framework to include "safe space" for a new Pedagogy-Safe Space-Technology (PSST) framework.

Finally, support for faculty development to learn to teach effectively online has been reported to be lacking in research studies for years (Berge & Mrozowski, 2001; Martin et al., 2020; Tallent-Runnels et al., 2006). Findings from this study reinforced this with participants reporting that to successfully practice active learning strategies in VLEs for an extended period of time, and then again in changed physical classrooms after returning from that time online, they needed three things illustrated in Figure 17: 1) Training, 2) Time, and 3) Compensation.

Figure 17

Facilitator Needs to Successfully Practice Active Learning Strategies

Note. Participants reported needing training, time, and compensation to successfully practice active learning strategies in VLEs and in physical classrooms.

Similar to the existing literature, participants reported not receiving these three necessary elements. Findings showed that training was amply provided and that participants were happy with the training offered, but time and compensation were neglected and participants reported feelings of frustration and burnout as a result. This led to issues returning to physical classrooms and participants being able to practice active learning approaches and strategies in the ways they hoped to.

Theme 3: Virtual In-Person Classrooms (VIPCs)

Theme 3: Virtual In-Person Classrooms (VIPCs) speaks directly to RQ2: How did the experience of practicing active learning strategies in virtual learning environments for an extended period of time influence how active learning strategies are practiced in physical classrooms? One way the experience impacted their practice of teaching in physical classrooms was that participants had to reconceptualize the physical classroom considering all they had learned in VLE. This researcher calls this new learning environment the virtual in-person classroom (VIPC). The VIPC includes increased student access to laptops, the use of online

digital tools in physical classrooms, and the ability to leverage the increased and equitable access to technology in any type of classroom to practice active learning strategies.

The VIPC, represented in Figure 18, is the best of both worlds; it leverages the strengths of digital tools, online methods of communication, and remote engagement strategies used in VLEs and situates them in a physical learning environment that is friendly to practicing active learning strategies. Bush et al. (2022) created a rubric for selecting active learning technologies to be used in physical spaces for active learning. The foundational criteria cited for those physical spaces are in line with this researcher's findings on what the VIPC is: easy to use, promotes participation, broadly available, equitable, flexible, and suitable for active learning activities.

Figure 18

Virtual In-Person Classrooms (VIPCs)

Note. This image, representing the virtual in-person classroom (VIPC), was created by the author, using canva.com, accessed on March 15, 2023.

In addition, findings from Oyarzun and Martin's (2023) systematic review of research on online learner collaboration (OLC) found that the most commonly used technologies were the same found used by participants in this study: the LMS, discussion boards, and online shared documents. These same collaborative digital tools participants reported using in VLEs transferred to physical classrooms at the case study institution after the return to in-person classes and helped to create the VIPC. VIPCs are important because access to existing ALCs was limited and construction of new ALCs could not keep up with demand. At the case study institution, after the return from VLEs, there were 20 ALCs available, with more planned for construction. This matches Beaudry's (2022) findings where they interviewed past Steelcase Active Learning Center Grant award participants, including the case study institution. On Beaudry's (2022) scale, UNC Charlotte ranked 28% of all institutions interviewed in scaling groups, meaning that the growth of ALCs was average at 20 or more with plans to grow more spaces. This was the highest growth group identified by Beaudry. Despite these promising findings, many participants who entered the COVID-19 pandemic VLE from an ALC returned to face-to-face teaching in a lecture hall or other traditional classroom because there were not enough ALCs to support courses and facilitators who needed them.

The ability to take lessons learned from the extended time spent in VLEs, students almost-universal access to laptops, and the ability to transform any classroom into an ALC contributed to creative space use on campus and provided the flexibility that students and faculty had come to expect. Kirby (2020) found that while in VLEs, students with disabilities, different cultural norms, or different learning styles, were disadvantaged by the move to fully online classes. This study found that the emergence of the VIPCs created accessible spaces using tools

from VLEs in physical classrooms. A big part of this was that after returning from the extended time in VLEs however, almost every student had a laptop, and if not a laptop, some smart device that could access the digital tools that were used during the time students were fully online. This became a "classroom changer" for participants as they reported using digital tools they had used in VLEs in the physical classroom because it made things easier.

Having a chat for questions running while they were physically teaching class to students face-to-face allowed for students to ask more questions. Using online shared documents or online whiteboards on student laptops instead of the embedded technologies in the ALC, meant students didn't have to move around as much and activities could transition more efficiently. This also had the unexpected effect of making physical whiteboards and digital displays unnecessary in some cases. As shown in *Radcliffe's Pedagogy-Space-Technology (PST) Framework: Modified for Study Participants*, technology could not only replicate elements of the space, now technology could also make spaces more accessible. Common complaints about ALCs and other learning environments from participants had to do with "line of sight" between the facilitator and students and any content being displayed, or about the ability for students to hear questions clearly in large rooms, or about storage space for student's belongings and issues moving around the room. Students with laptops or other smart devices could all see the content from wherever they were sitting and place questions in a chat that the facilitator was monitoring while they still engaged with their groups and worked on active learning projects using online shared documents. The use of these digital tools during live classes taps into Radcliffe's (2009) PST framework, but the PST framework must be viewed now as a Venn diagram, *Virtual Reality Active Learning Classroom (VR ALC)*, because direct line relationship between the framework elements no longer suffice for explaining how the three parts of the model engage. They overlap

each other now in a more complex manner best represented with flexibility to define new ways of engagement between the elements. For example, space is now redefined by technology and technology transforms space so technology can then enable active learning strategies in non-ALCs.

Findings from this study showed a continued demand for ALCs that was unmet when participants formerly teaching in ALCs found themselves returning to lecture halls and traditional classrooms after the extended time spent in VLEs. This is in line with Beichner (2014), Jamieson et al. (2000), and Van Horne et al. (2012) who found that despite over 20 years of progress, the use of lecture halls and other traditional classrooms are still in use. While many aspects of higher education had changed rapidly due to the COVID-19 pandemic, the learning spaces at the case study institution had not kept up with the rapid changes in technology.

Monitors has been upgraded so most classrooms had a webcam to support web conferencing software, upgrades to audio were also implemented in many classrooms, and some rooms were given additional white boards, but this still did not keep faculty who had been practicing active learning strategies in ALCs prior to the move from VLEs from being relegated to lecture halls when the campus returned to face-to-face instruction. ALC spaces were premium and were being strategically used for large-classes and no longer accessible to all faculty who practiced active learning strategies. Because large lecture halls and theater-style classrooms are traditionally the hardest in which to practice active learning due to large-enrollment and fixed seating arrangement (Braxton et al., 2000), the emergence of the VIPC became a powerful tool for overcoming learning space barriers and ALC shortages. Student access to laptops and the use of online digital tools in physical classrooms extended the capabilities of these types of learning

environments. Participants imagined new ways to practice active learning strategies in classrooms that have traditionally not supported the practice of active learning strategies.

Implications and Recommendations

Little research existed on adopting active learning approaches for ALCs to VLEs (Pilkington, 2018) prior to the COVID-19 pandemic; this study begins to rectify that but additional research is needed. Emerging literature is still focusing heavily on dated ideas of ALCs and the physical classroom space. Several participants taught in both synchronous and asynchronous spaces and findings seemed relevant to both delivery modes. More research is needed about the impact of the VLE mode on active learning practice. Additional implications from this study about the emergence of a new learning space, the VIPC, mean that all learning environments need to be reassessed through a fresh lens. Bush et al.'s (2022) rubric for selecting active learning technologies draws heavily on two existing systems for rating learning spaces and eLearning tools: EDUCAUSE's Learning Space Rating System (LSRS) and Anstey and Watson's (2018) Rubric for eLearning Tool Evaluation. Even in Bush et al.'s (2022) article, published by the most respected organization in this field, EDUCAUSE, the focus is still mainly on applying these tools to practice active learning strategies in physical ALCs. VLEs are briefly covered and there is little substance devoted to their importance as active learning spaces.

Recommendations include that existing rubrics and ratings systems, models and frameworks, like Bybee et al.'s, (2006) 5E Instructional Model Learning Cycle and Chi and Wylie's (2014) ICAP Framework, which were designed for practicing active learning strategies in physical learning environments, will need to be revisited and expanded to include both VLEs, physical classrooms, and support the use of digital tools as part of practicing active learning strategies in diverse learning environments that include spaces like the VIPC.

The hallmark designs of classrooms filled with embedded technologies (SCALE-UP, Studio Classroom, TILE, TEAL) described by Beichner et al. (2000), Breslow (2010), Van Horne et al. (2012), and Whiteside et al. (2010) will need to be reassessed. Physical spaces were traditionally chosen for practicing active learning approaches and strategies because they made social engagement, immersive learning, collaborative learning, and performance-based techniques more effective (Bennett, 2007). Implications from the theme "working the room" highlight the extended time spent in VLEs, the lessons learned about how active learning strategies can be implemented online, and how digital tools can enhance physical spaces.

Recommendations for learning space design going forward suggest less embedded hard technologies (computers) and more embedded tools for connectivity (electrical outlets, adequate Wi-Fi, Bluetooth supported devices). With students bringing their own technology to the rooms, student storage is also stated as a need in newer spaces. What does not appear to be going away anytime soon are physical classrooms configured for students to meet in-person in groups. Faculty will still be "working the room." Active learning classrooms are still the preferred learning space of participants interviewed, however findings from this study show that the design and function of ALCs will need to change to meet new realities.

Implications connected to all three themes: "Working the Room," "It's Not in the Syllabus." and to the emergence of the VIPC, are connected to existing research showing students with instructors who practice active learning strategies attain better learning outcomes (Braxton et al., 2000; Chickering & Gamson, 1987; Wilson et al., 2007) and that failure rates are reduced for women and minorities (Beichner et al., 2000, 2007; Beichner & Saul, 2003; Beichner, 2008, 2014; Kirby, 2020, Wilson et al. 2007). Specifically, Chickering and Gamson's (1987) seminal work that propelled the use of active learning techniques in undergraduate

education across academia is dated and the "seven principles for good practice in undergraduate education" need to be revisited. Recommendations are that these seminal studies be reconducted through the lens of post-VLE learning to determine if the findings still hold up with an academic workforce that has been exposed to new teaching practices, with new teaching tools, and modified learning environments. Repeating these types of studies across all learning environments and spaces will confirm if student centered active learning approaches are still the superior pedagogical practice for higher education faculty no matter what the course modality. Chickering and Gamson's (1987) "Seven Principles" needs a substantial revision that includes advances in adaptive learning and cloud-based technologies.

Finally, existing research by Berge and Mrozowski (2001), Martin et al. (2020), and Tallent-Runnels et al. (2006) illustrate how faculty development practices are still woefully lacking in support and a holistic approach. Implications from the "It's not in the Syllabus" theme showed that while the Center for Teaching and Learning at the case study institution provided training the participants found useful during the time practicing active learning strategies in VLE and during the return to face-to-face courses in physical classrooms, they also reported feeling like they were not given enough time to properly develop course materials or compensation for work done above and beyond their 9-month contracts by their departments and administration. This led to feelings of frustration and burnout among participants. In addition, it was noted that the population pool from which participants were recruited was lacking in diversity.

Recommendations for administration and leadership at all institutions are that faculty are provided with not only professional development and training opportunities on rapidly changing advancements in teaching and learning, but they are also provided with adequate time to plan to implement these new strategies and when that time exceeds normal contracts, they are

recognized and rewarded for their efforts. Additional research is needed to explore who participates in FLCs and why.

Conclusion

Virtual reality active learning classrooms (VR ALCs) and virtual in-person classrooms (VIPCs) are the next natural evolution of active learning classrooms (ALCs). Based on all that was learned from this study, it is easy to see how active learning approaches and strategies have been forced to adapt based on the learning environment due to the rapid changes that occurred during the time that higher education courses were fully in VLEs. The exponential growth in knowledge and use of digital tools and technologies by the majority of faculty was unprecedented. Once these faculty returned to physical classrooms, the tools and opportunities for engaging students in active learning practices in new ways came naturally, an extension of the VLEs they had been teaching in now embedded in the physical classroom. Faculty could not go back to the way things were before and the advancements keep coming.

Like reimagining Lewin's (1947) change model as a two-step cycle and Barber et al.'s (2013) avalanche, higher education had entered the predicted moment that would trigger about 30 years' worth of change in a very short period of time. There will be no stopping the snowball effect of advancements and for academic institutions to survive they must embrace and reconceptualize what the classroom looks like and how students engage with it. This researcher views this as a positive opportunity for major educational reform to occur across academia. With regard to the use of active learning strategies, the literature strongly supports student-centered approaches to teaching and learning as providing superior learning outcomes for students. When considering learning spaces that support active learning strategies, the norm up until now has been the ALC, however findings from this study suggest that with the proper training, time, and

compensation, faculty who practice active learning can create ALCs in almost any learning environment with the right digital tools and course design. Active learning classrooms do still matter, they are just not always "physical spaces" anymore. These findings warrant additional research on how active learning approaches and strategies are being practiced in all learning environments and the impact they have on student outcomes by demographic subgroups going forward to create a new solid base of literature supporting the use of active learning practices and active learning spaces.

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Appendix A

Participant Recruitment Email

My name is Jules Keith-Le; I am a doctoral candidate in the Educational Leadership program at UNC Charlotte. I am seeking participants for my doctoral research that explores faculty experiences practicing active learning strategies in physical and virtual learning environments throughout a global pandemic. Dr. Lisa R. Merriweather serves as the faculty advisor on this research.

You are receiving this email because you participated in the Active Learning Academy, and I am inviting you to take part in this study.

If you consent to participate in this study, you will commit to a recorded 90-minute interview that will take place over web conferencing software. Participation in this research is completely voluntary.

Below is a link to a survey inviting you to participate in this study. Please click this link <insert link> if you are interested in participating in this research study. I will contact you to schedule an interview at a future date and time that is convenient for you. If you have any additional questions about this research study, please feel free to contact me or my Faculty Advisor.

Jules Keith-Le, Primary Investigator
jxxxx@uncc.edu

Dr. Lisa R. Merriweather
lmerriwe@uncc.edu

Appendix B

Qualtrics Participant Invitation

Thank you for your interest in participating in the dissertation research study of Jules Keith-Le on faculty experiences practicing active learning strategies in physical and virtual learning environments throughout a global pandemic.

Please read the following Informed Consent document <insert link> about this research study and answer the following questions.

1. Preferred Name (first and last): (open-form text box)

2. Preferred methods of contact (email address and phone number): (open-form text box)

3. I have read and understand the Informed Consent document for the research study entitled: *Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education.*
   a. Yes
   b. No

4. I have experience teaching in both active learning classrooms (ALCs) and traditional classrooms at UNC Charlotte.
   a. Yes
   b. No

5. I was teaching in an ALC for two semesters prior to the move to emergency remote teaching in March of 2020.
   a. Yes
   b. No

6. I returned to teaching a face-to-face course in a physical classroom during or after fall 2021.
   a. Yes
   b. No

7. I agree to volunteer to be a participant in the research study, be contacted to be interviewed, and take part in respondent validation of my interview transcripts.
   a. Yes
   b. No

Auto-generated survey completion response:

Thank you for completing the participant invitation survey. Your response has been

recorded and you will receive an email from the Primary Investigator with next-steps based on your individual responses in the near future.

Sincerely,

Jules Keith-Le, Primary Investigator
jxxxx@uncc.edu

Dr. Lisa R. Merriweather
lmerriwe@uncc.edu

Appendix C

ALA Member Informed Consent Form

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Title of the Project: Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education

Principal Investigator: Jules Keith-Le, MFA, University of North Carolina Charlotte

Faculty Advisor: Lisa R. Merriweather, Ph.D., University of North Carolina Charlotte

Study Sponsor: University of North Carolina Charlotte, Cato College of Education, Department of Educational Leadership

You are invited to participate in a research study. Participation in this research study is voluntary. The information provided is to help you decide whether to participate. If you have any questions, please ask.

Important Information You Need to Know

- The purpose of this exploratory and descriptive case study is to understand the experiences of higher education faculty participating in a faculty learning community (FLC) focused on practicing active learning strategies throughout an evolving pandemic to discover how the increased use of virtual learning environments have impacted the specific faculty's use of active learning strategies in physical classrooms.

- I am asking current, and former, members of the UNC Charlotte Active Learning Academy (ALA) faculty learning community who meet the following criteria to volunteer to participate in this study:
  Participants must have:
  - participated in the ALA for a minimum of two cohorts
  - taught classes designated as face-to-face instruction in one of the university's ALCs for a minimum of two semesters prior to the move to emergency remote teaching in March 2020,
  - returned to teaching classes designated as face-to-face instruction in a physical classroom during or after fall of 2021, and have
  - taught in a traditional classroom for a minimum of one semester at UNC Charlotte.
- This is a two (2) part study:

○ In the first part, I will ask you to participate in the 90-minute semi-structured interview. 48-hours prior to the interview you will receive the interview agenda and a copy of the interview guide so you can review the questions. Interviews will be scheduled over web conferencing software. Audio and video will be used; however, the video portion of the interview will be deleted immediately after the interview and only the audio will be retained and sent for transcription.

○ In the second part, after transcripts have been returned and reviewed by the researcher, you will be asked to participate in respondent validation (member checking) where you will be given an opportunity to add to, redact, or edit your transcript to ensure it reflects your lived experiences and intended meanings about the questions asked.

- Some of the questions I'll ask you may be personal and sensitive. For example, we'll ask about your experience teaching during the COVID-19 global pandemic, a time-period that was distressing and painful for many around the world. These questions might cause you to experience emotional discomfort as you relive your personal experiences during this event. You may choose to skip a question you do not want to answer. You may discontinue the interview at any time.

- All UNC Charlotte employees and anyone living in their household have access to a confidential employee assistance program with counseling resources and more.
  Information on these resources can be found at
  https://hr.charlotte.edu/employee-relations/compsych-guidance-resources-employee-assistance-program or by calling 1-877-603-8259.

- The benefit to individual participants is the ability to reflect on their individual teaching strategies in different learning environments, which may offer some insight for future course delivery based on the learning environment. The study results may help them better understand any impact to active learning strategies that may have emerged from the extended period spent teaching exclusively in virtual learning environments and how they are being practiced in physical classrooms now that we have returned to full capacity in-person courses at UNC Charlotte.

Please read this form and ask any questions you may have before you decide whether to participate in this research study.

<u>Why are we doing this study?</u>
The purpose of this study is to understand the experiences of higher education faculty participating in a faculty learning community (FLC) focused on practicing active learning strategies throughout an evolving pandemic to discover how the increased use of virtual learning environments have impacted the specific faculty's use of active learning strategies in physical classrooms.

<u>Why are you being asked to be in this research study?</u>
You are being asked to be in this study because you have participated in the Active Learning Academy and meet the recruitment criteria.

<u>What will happen if I take part in this study?</u>
If you choose to participate you will be asked to engage with the researcher twice. Once during a 90-minute web conference interview and a second time, online, reviewing and notating your interview transcription. For the first part of this study, I will work with you to schedule a time that works best for you to be interviewed. You will receive an agenda for the interview and a copy of the interview guide 48-hours before our interview.

Interview questions will ask questions about your teaching background (years of service, types of institutions, types of pedagogies used), your experience with UNC Charlotte's Active Learning Academy, your use of active learning strategies in the classroom, your use of active learning classrooms (ALCs), how you used active learning strategies prior to the pandemic, how you used active learning strategies in virtual learning environments during the time the university was entirely online, and how you used active learning strategies in physical classrooms when the university returned faculty and students to in-person classrooms during or after fall 2021.

Once your interview has been transcribed and reviewed by the researcher, you'll receive an email inviting you to take part in the second part of this study - respondent validation/member checking. This email will include a URL link to click on that will take you to a secure and encrypted folder that only you and the researcher have access to that houses your transcript in Microsoft Word format. Using the track changes tool, you'll be asked to add, redact, or edit any part of your transcript that needs to be changed to ensure your lived experiences are captured accurately. You'll be given two weeks to complete respondent validation/member checking.

Your total time commitment if you participate in this study is estimated to be 3-hours: 1) An estimated 30 minutes maximum that you may spend scheduling your interview and reviewing research study materials, 2) an estimated 90-minutes for the interview, and 3) respondent validation/member checking of your transcript is unique to each individual times will vary, however, the researcher estimates it should take no longer than 1-hour.

<u>What benefits might I experience?</u>
The benefit to you is the ability to reflect on your individual teaching strategies in different learning environments, which may offer some insight for future course delivery based on the learning environment. The study results may help you better understand any impact to active learning strategies that may have emerged from the extended period spent teaching exclusively in virtual learning environments and how they are being practiced in physical classrooms now that you have returned to teaching in-person courses at UNC Charlotte.

<u>What risks might I experience?</u>
The questions we'll ask may evoke a personal and sensitive response due to the enormity of experiences individuals have gone through during the COVID-19

pandemic. For example, we'll ask you about the types of stressful experiences you've had teaching throughout a pandemic. These questions might cause you to experience emotional discomfort as you relive your personal experiences. You may choose to skip a question you do not want to answer. You may discontinue the interview at any time.

How will my information be protected?
You are asked to provide preferred methods of contact (email address and phone number) as part of this study. We will use your email address and phone number to contact you to schedule the web conference interview and your email address to share your transcripts with you. To protect your privacy (identity), we'll assign a pseudonym to you for your transcribed interview. Other mention of personal identifiable data (PID) or site-specific data that could be used to identify you (colleges, departments, building names, classroom names/numbers, course names, software names, other personnel names, etc.) will deleted or assigned a larger aggregate categorization were appropriate for inclusion in the study results (example: the physical sciences, the humanities, etc.). While the study is active, all data will be stored in a password-protected database that can be accessed by the primary researcher. After your transcripts have been coded, analyzed, and written up, they will be securely stored in an encrypted drive that only the researcher has access to until the final study has gained approval for publication. All audio recordings will be retained for 3-years after the study has been completed and de-identified transcripts will be retained indefinitely. Only the primary investigator will have routine access to the study data. Other people with approval from the Investigator, may need to see the information we collect about you. Including people who work for UNC Charlotte and other agencies as required by law or allowed by federal regulations.

How will my information be used after the study is over?
After this study is complete, study data will only be shared as findings in the researcher's published results. All audio recordings will be retained for 3-years after the study has been completed and de-identified transcripts will be retained indefinitely. The survey in Qualtrics will be deleted once the data have been collected and analyzed. The data we share will NOT include information that could identify you.

Will I receive an incentive for taking part in this study?
No, there is no monetary incentive for taking part in this study.

What other choices do I have if I don't take part in this study?
If you do not wish to take part in this study, you simply need to indicate that on the survey that will be sent to you requesting your participation. You will have the opportunity to read the findings from the study and may gain scholarly knowledge from its results.

What are my rights if I take part in this study?
It is up to you to decide to be in this research study. Participating in this study is

voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer.

Who can answer my questions about this study and my rights as a participant?
For questions about this research, you may contact the primary investigator, Jules Keith-Le, jxxxx@uncc.edu, 704-XXX-xxxx and faculty advisor Dr. Lisa R. Merriweather, lmerriwe@uncc.edu, 704-687-8740.

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Office of Research Protections and Integrity at 704-687-1871 or uncc-irb@uncc.edu.

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

I understand what the study is about, and my questions so far have been answered. I agree to take part in this study.

_____
Name (PRINT)

_____
Signature   Date

_____
Name & Signature of person obtaining consent   Date

Appendix D

Participants Initially Selected

Thank you for volunteering to participate in the research study titled: *Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education,* conducted by Jules Keith-Le. This study seeks to explore and describe faculty experiences practicing active learning strategies in physical and virtual learning environments throughout a global pandemic.

Purpose
You have been selected to be interviewed and I am reaching out to work with you to schedule a date and time that is convenient for you to meet with me for 90-minutes to discuss your experiences practicing active learning strategies.

Next Steps
Please click this Doodle poll link <insert link> and indicate all dates and time that will work for your schedule. If none of these dates work for you, please reply to this email, and propose dates and times that would be most convenient for you.

What to Expect
- Once a date and time have been agreed upon, you will receive a Google Calendar invitation for your interview time slot with a link to the web conference. If you need to reschedule your interview at any point in the process, please email Jules Keith-Le at jxxxx@uncc.edu.

- 48-hours prior to your interview you will receive a copy of the Informed Consent Document, Demographics Survey, and the Interview Guide. You will need to sign the Informed Consent Document using the DocuSign link and complete the Demographics Survey prior to your interview.

- Please review the Interview Guide prior to the interview appointment and consider the questions that will be asked.

- After the interview has been concluded, you will be contacted to participate in respondent validation of your interview transcripts. You will receive a separate email when your transcripts are ready to be reviewed.

- All data collected from your interview will be stored in a password-protected database which only the primary investigator has access to.

- Final study results will be shared with you upon publication.

Appendix E

Participants Not Initially Selected

Thank you for volunteering to participate in the research study titled: *Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education,* conducted by Jules Keith-Le. This study seeks to explore and describe faculty experiences practicing active learning strategies in physical and virtual learning environments throughout a global pandemic.

Purpose
You are an eligible participant to take part in this research study about practicing active learning strategies and have indicated your interest in participating. Thank you!

Next Steps
The researcher is evaluating all individuals who have volunteered to participate in this research study. Not all who have volunteered to participate may be selected.

What to Expect
- If you are selected to be interviewed, you will receive a second email with a link to a Doodle poll in which you will be asked to select dates and times that are most convenient for you.

- Final study results will be shared with you upon publication regardless of your participation in an interview.

- For questions about this research, you may contact the primary investigator, Jules Keith-Le, jxxxx@uncc.edu, 704-XXX-xxxx and faculty advisor Dr. Lisa R. Merriweather, lmerriwe@uncc.edu, 704-687-8740.

Appendix F

Interview Protocol (Interview Guide)

Process Note: Not all questions may be asked. If in-depth information is shared in response to a previous question, some questions may be skipped. In addition, probing questions may be asked at the discretion of the researcher.

Introductory Questions

Thank you for meeting with me today. Before we get started talking about your experiences practicing active learning in physical and virtual learning environments, I would like to capture information about you and your role here at UNC Charlotte:

- What is your current title at the university?
- How long have you worked at UNC Charlotte?
- Have you always been in this role at UNC Charlotte, or have you worked in other departments/areas with different titles?
- Why did you choose to join the Active Learning Academy (ALA) faculty learning community?
- Why have you re-joined the ALA over multiple years?

Pre-Pandemic Teaching in Active Learning Classrooms (ALCs)

You were selected to participate in this study because you were teaching in UNC Charlotte's Active Learning Classrooms for at least two semesters prior to the move to virtual learning environments necessitated by the COVID-19 pandemic. I am interested in hearing more about how you were teaching in these classrooms:

- Describe the ALCs you were teaching in prior to the move to emergency remote online learning in March of 2020.
- What active learning strategies were you using in these ALCs?
- How did the design and/or layout of the ALC affect your choice of active learning strategies?
- How did embedded technologies in the ALCs play a role in your use of active learning strategies?

Teaching in Virtual Learning Environments between March 2020 and July 2021

I want to understand your experiences during the time you were required to teach in fully virtual learning environments. I am interested in hearing about what your teaching looked like and any use of active learning strategies you may have employed virtually:

- How did you modify your courses that were being taught in ALCs for virtual delivery?

- What format(s) did you use? Synchronous, Asynchronous, or a combination of both (Bichronous)?
- What active learning strategies did you use in the virtual learning environment?
- How did the active learning strategies change from how they were being used in the ALC?
- What challenges did you face practicing active learning strategies in virtual learning environments?
- What else did you do differently to practice active learning strategies in virtual learning environments?

Return to Teaching In-Person in Physical Classrooms Fall 2021

Now I am interested in hearing about your experience returning to teaching face-to-face classes in physical classrooms. I specifically am interested in how you practiced active learning strategies in physical classrooms after returning from being in a virtual learning environment for an extended period of time.

- Describe the first face-to-face classroom you taught in after you returned to in-person classes?
    - Had you taught in that classroom before? If so, when?
    - Was it an ALC?
- What was different about teaching in a physical classroom since the last time you had taught in an ALC?
- What active learning strategies did you use?
- How did your use of active learning strategies change from the last time you had used them in an ALC?
- How did the design and/or layout of the classroom affect your choice of active learning strategies?
- How did embedded technologies in the classroom play a role in your use of active learning strategies?
- Did your experience teaching in virtual learning environments influence how you now practiced active learning strategies in the physical classroom?
- What active learning strategies did you use for the first time in virtual learning environments that you continued to use in physical face-to-face classrooms?
- Is there anything else you would like me to know about?

Appendix G

Interview Agenda

Thank you for volunteering to participate in the research study titled: *Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education,* conducted by Jules Keith-Le.

Your interview has been scheduled for <date & time> and we will meet over <web conferencing software> using the following link < insert link>. This link should also be on your Google calendar.

Agenda 90-minute Interview

Topic	Time Allotted
Welcome, review of documents, questions	5 minutes
Informed consent review, questions, permission to record	5 minutes
Interview Guide Part 1: Introductory Questions	20 minutes
Interview Guide Part 2: Pre-Pandemic Teaching in Active Learning Classrooms (ALCs)	20 minutes
Interview Guide Part 3: Teaching in Virtual Learning Environments between March 2020 and July 2021	20 minutes
Interview Guide Part 4: Return to Teaching In-Person in Physical Classrooms Fall 2021	20 minutes

Interview Guide
The guide that will be used for your interview is attached to this email. It includes all the questions that you will be asked during the interview. Please take some time to read over the questions and note any questions that you may have for the researcher. There is time built into the interview for you to ask questions about the interview protocol.

Thank you.

For questions about this research, you may contact the primary investigator, Jules Keith-Le, jxxxx@uncc.edu, 704-XXX-xxxx and faculty advisor Dr. Lisa R. Merriweather, lmerriwe@uncc.edu, 704-687-8740.

Appendix H

Post-Interview Next Steps

Thank you for participating in an interview for the research study titled: *Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education,* conducted by Jules Keith-Le. Your lived experiences practicing active learning strategies throughout a global pandemic are valuable data that will now be analyzed.

<u>**Next Steps**</u>
- The video file from your interview will be permanently deleted.

- The audio file from your interview will be professionally transcribed by a transcription service and reviewed by the researcher for accuracy.

- Your interview transcript will be stored in a secured and encrypted drive that only the researcher will have access to.

- You will receive an email when your transcript is ready for you to review. You will be asked to participate in respondent validation, also called member checking, which will allow you to add, edit, and redact your transcript so that it accurately reflects your lived experiences and intended responses to the questions asked during the interview.

- The next email you receive will contain additional information on how to conduct the respondent validation as well as give you secure access to a copy of your transcript that you can edit.

Thank you for your participation in this research study. I will be in contact with you soon.

For questions about this research, you may contact the primary investigator, Jules Keith-Le, jxxxx@uncc.edu, 704-XXX-xxxx and faculty advisor Dr. Lisa R. Merriweather, lmerriwe@uncc.edu, 704-687-8740.

Appendix I

Request for Respondent Validation

Thank you for participating in an interview for the research study titled: *Does the physical active learning classroom matter? Faculty experiences of practicing active learning during an era of rapid transformation in higher education,* conducted by Jules Keith-Le.

Your interview transcript has been transcribed and reviewed by the researcher and is now ready for respondent validation, also known as member checking, and is meant to ensure trustworthiness in the analysis and ultimate findings of this study.

Directions
- This is an opportunity for you to read your transcript and make changes. You may add information, edit existing information, or redact information so that the transcript accurately reflects your lived experiences and intended responses to the questions asked during the interview.

- Your transcript is being housed in a secure and encrypted location that only you and the researcher have access to. You can access your transcript here <insert link>.

- Open your transcript file using Microsoft Word. Use the track changes feature to capture any additions, edits, or redactions you make to your transcript.

- Save the edited version of your transcript file to the shared folder with your initials and date added to the original file name.

- You have two weeks to make changes to your transcript: The access to your transcript will be removed on <insert date>.

For questions about this research, you may contact the primary investigator, Jules Keith-Le, jxxxx@uncc.edu, 704-XXX-xxxx and faculty advisor Dr. Lisa R. Merriweather, lmerriwe@uncc.edu, 704-687-8740.

This concludes your time commitment in this research study. Thank you for your participation! The study's findings will be shared with you upon publication.

APPENDIX J

Demographics Survey

Please answer the following questions:

1. What is your age?
　　a. 18 - 24 years
　　b. 25 - 34 years
　　c. 35 - 44 years
　　d. 45 - 54 years
　　e. 55- 64 years
　　f. 65 - 74 years
　　g. 75 years or above
　　h. Prefer not to say

2. What is your race?
　　a. Asian or Pacific Islander
　　b. Black or African American
　　c. Hispanic or Latino
　　d. Native American or Alaskan Native
　　e. White or European American
　　f. Multiracial or Biracial
　　g. A race/ethnicity not listed here, see below <open text entry box>

3. What gender do you identify as?
　　a. Female
　　b. Male
　　c. Non-Binary
　　d. Prefer not to respond
　　e. Prefer to self-describe, see below <open text entry box>

4. What is your current faculty rank or title?
　　a. Part-Time Instructor
　　b. Full-Time Instructor
　　c. Assistant Professor
　　d. Associate Professor
　　e. Professor
　　f. Other, see below <open text entry box>

APPENDIX K

Digital Tools Used in Virtual Learning Environments

Tool	Purpose/Goal
Adaptive Learning Courseware	Third-party courseware that includes: content, videos, assignments, projects, quizzes, tests, assessments, remediation, homework, and resources with active learning strategies built into the course design that typically runs through the institution's LMS or a stand-alone website and adjusts to personalized student learning outcomes.
Alternative Assessment Submission Tool	A third-party tool that plugs into the institution's LMS and allows students to submit paper and three-dimensional assignments that can then be viewed, notated, and graded online by instructors.
Break Out Rooms	A function of web conferencing software that simulates small groups by moving students into smaller web conference rooms for a set period of time to allow for focus on a prescribed task.
Cell Phone Cameras	Used by students to create and/or document and submit an assignment to the institution's LMS.
Chat	A function of web conferencing software that allows for students to communicate with each other and with the instructor; publicly and privately.
Comic Strip Software	Open source, third party software that allows for students to build their own comic strips. In this instance, used for a project where students tell a story about their course content using visual elements through the comic strip deliverable.
Digital White Boards	Replaced physical classroom white boards as a place for students to collaborate and brainstorm in the online environment using digital elements including rich text editor tools, shapes, drawing tools. and digital sticky notes.
Discussion Boards	Online spaces that engage students in a group discussion on course content or a prompt from the instructor.

Tool	Purpose/Goal
Emoticons and Reaction Symbols	A feature of web conferencing software that allows for students to indicate a singular response or feeling to a prompt using a graphic.
Forms and Surveys	Various tools that allow instructors to capture information and feedback from students, identified or anonymous, online with the ability to sort the responses and analyze the data for a use in the academic course.
Learning Management System (LMS)	All academic courses have an online course shell in the institution's LMS where materials for the course and grades should be organized and shared with students. If participants had not previously organized their course content using the LMS, the move to VLEs required this change
LMS Announcements	A feature of the institution's LMS that allows you to send a message to the whole class.
LMS Quiz Builder	A feature of the institution's LMS that allows you to build online quizzes and tests that are administered online.
Online Polling	Use of online polling software to ask questions of the class. The institution has adopted one specific polling software and the web conferencing tool adopted by the institution also has polling features.
Online Shared Documents	A tool adopted by the institution that provides online shared documents, slide shows, spreadsheets, and more. Groups collaborate on assignments and course work using these as they can all access and work in a shared document at once and the tool autosaves.
Recorded Videos	Instructors have many options for recording videos and sharing them with students through the institution's LMS or through online video resources.
Screen Sharing	A feature of web conferencing software that allows for instructors and students to share their screens with the entire course.
Simulation Courseware	Specialized educational software that simulates in-person STEM labs.

Tool	Purpose/Goal
Smart Phones	Students in groups/teams exchanged numbers and emails and texted/messaged as a way of communicating about coursework.
Virtual Reality Classroom	Software the replicates an ALC and gamifies the course experience. Students and instructors have avatars. As you move around the VLE you can hear people talking the closer you get to them, interaction with others is through microphones, speakers, chats, and sharing/engagement with pre-built links.
Web Cameras	While not required at UNC Charlotte, one participant required students to have cameras turned on and worked to protect student privacy by teaching students how to enable digital backgrounds.
Web Conferencing Software	An enterprise supported online synchronous course meeting tool that is used for academic courses, office hours, meetings, and other events.

Note: This table reports out the deidentified digital tools used by participants of this study in virtual learning environments and the purpose and/or goal of each tool.