THE LIVED EXPERIENCES OF EDUCATORS LEVERAGING EDUCATIONAL TECHNOLOGY AND CONNECTIVISM FOR FOSTERING ACADEMIC ACHIEVEMENT IN HIGHER EDUCATION: A TRANSCENDENTAL PHENOMENOLOGICAL STUDY

by

Cynthia T. Plueger

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy in Higher Education Administration-

Educational Leadership

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APPROVED BY:

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Abstract

The purpose of the transcendental phenomenological study was to describe the lived experiences of educators at public universities in the southern region of the United States who leverage educational technology to enhance student engagement and improve academic achievement through the application of connectivism principles in learning environments. This study was guided by the connectivism theory, which highlights the significance of interconnected networks, contemporary knowledge, and the interrelatedness of information in digital higher education learning environments. The central research question was: How do educators at public universities in the southern region of the United States describe their lived experiences with leveraging educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments? The study combined Moustakas's transcendental phenomenology approach with George Siemens's connectivism theory to explore the essence of human learning experiences. Data collection methods included individual interviews, focus groups, and letter writing. During the analysis phase, epoché was employed to ensure an unbiased and objective interpretation of the data. The findings of this research study highlight the importance of establishing profound educational technology networks and offering educators comprehensive support and professional development training. The connectivism learning theory is crucial to modern education and is aligned with educational technology that promotes connectivity and collaboration. By addressing the training and support needs, educators can overcome integration challenges and facilitate technology adoption in educational settings. These insights are vital for advancing technology-enhanced education.

Keywords: student engagement, academic achievement, connectivism, educational technology, higher education

Copyright

Dedication

I humbly offer my dissertation to the divine God, who holds the highest authority as the origin of all that is virtuous.

I am grateful for my spouse and children, who constantly motivate and encourage me to pursue the pinnacle of lifelong learning.

To my mother in heaven, who taught me moral lessons on discipline from a young age and continues to support me spiritually.

To my mother-in-law and father-in-law, thank you for your love and support.

To my chair and committee member, who was the guiding light every step of the way as I researched for this dissertation.

To my family and friends who supported me through prayers and encouragement to never give up, may you forever pursue knowledge throughout your lives by any means necessary.

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List of Abbreviations

Artificial Intelligence (AI)

Content, Activities, Facilitation, and Evaluation (CAFE)

Emotional Intelligence (EI)

Engagement, Enhancement, and Extension (Triple E)

Higher Education Institutions (HEI)

Human Element (HE)

Information and Communication Technologies (ICT)

Learning Management Systems (LMS)

Massive Open Online Course (MOOC)

Perceived Teacher Innovation (PTI)

Self-Regulated Learning (SRL)

Technological, Pedagogical, and Content Knowledge (TPACK)

CHAPTER ONE: INTRODUCTION

Overview

Given the widespread integration of technology in everyday life, where digital tools and platforms play a pivotal role in communication, commerce, and entertainment, contrasted with its limited incorporation in higher education teaching practices, it is evident that educational technology signifies the future of teaching in higher education. Chapter One of this study emphasizes the critical need for incorporating digital technologies in higher education. This chapter clarifies the research focus and addresses the insufficient use of educational technology in pedagogy. Additionally, it outlines the study's objectives to explore educators' experiences leveraging educational technology to enhance student academic achievement and cultivate network connections in higher education learning environments at public universities in the southern region of the United States. The chapter also provides an overview of the research purpose while presenting crucial terminology that serves as a basis for comprehending the complex relationship between technology, education, and the connectivism learning theory.

Background

This study's context encompassed historical, social, and theoretical elements that guided the investigation. Certain historical events, such as the COVID-19 pandemic, have led to the current state of higher education learning and technology implementation, resulting in an increase in online learning where virtually all higher education institutions transitioned to online course formats (Li, 2022; Wei & Chou, 2020). The social construct involved a seminal concept representing the intricate web of connections, relationships, and interactions that facilitate learning for stakeholders, such as students, faculty, staff members, and student support liaisons

in the digital age. Finally, this section comprises the study's theoretical foundations of connectivism theory (Siemens, 2004; Siemens, 2005).

Historical Context

Education has a long history of relying on in-person classroom interactions between educators and students, which leads to sound connections and student engagement. However, the educational landscape has undergone a revolutionary change with learning management systems (LMS) and other significant technological advancements in the latter part of the 20th century (Karakose & Demirkol, 2021; Li, 2022; Palvia et al., 2018). Over the decades, the evolution of online education has been marked by significant advancements and transformative shifts (Sayaf et al., 2021). Early attempts at online education were often characterized by static content delivery, limited interaction, and a lack of engagement mechanisms (Palvia et al., 2018; Piccoli et al., 2001). However, as technological capabilities improved, so did the potential for creating more vibrant and interactive classrooms. In the late 20th century, the advent of the internet and digital technologies laid the groundwork for the emergence of educational technology embedded within learning environments. Computers, the internet, and digital instruments have revolutionized the educational landscape.

Throughout history, educators have integrated educational technology to enhance their teaching and learning (Dawo & Sika, 2021; Downes, 2019). From classic tools such as chalkboards and overhead projectors to cutting-edge digital platforms, the evolution of technology has showcased immense potential to revolutionize educational methodologies for the greater good (Barabasi, 2003; Siemens, 2006). In the late 20th and early 21st centuries, the widespread adoption of the internet and digital technologies brought about a considerable shift, not only in the tools that were made available but also in how we view the learning process

(Downes, 2019). Connectivism, proposed by George Siemens, has emerged in the modern digital era. The theoretical framework recognized the limitations of traditional learning theories in fully explaining how knowledge is acquired (Siemens, 2004; Siemens, 2005). This approach emphasized the importance of networks in facilitating and shaping knowledge acquisition. The idea was that when information was abundant, the learning process was centered around effectively navigating, establishing, and maintaining connections within a networked environment (Siemens, 2004). Inspired by the concept of connectivism, educational technology aimed to enhance student engagement and academic performance by fostering connections. Student engagement was accomplished by creating interactive platforms and promoting self-directed and collaborative learning, which made education more flexible to meet the demands and opportunities of the digital age (Downes, 2019).

In recent years, the proliferation of online courses and programs has been driven by the increasing demand for flexible and accessible education options (Drigas et al., 2023; Vezne et al., 2023; Zhu et al., 2023). Those who quickly adopted the technology options recognized the potential to enrich the learning experience, which led to their incorporation into classroom contexts (Muljana & Luo, 2019; Sayaf et al., 2021). The integration of technology in education has made it possible for educators and students to use multimedia presentations, online resources, and interactive software (Al-Rahmi et al., 2021; Bond & Bedenlier, 2019; Vlachopoulos & Makri, 2019). In the 1990s, online learning environments gained immense popularity and created platforms and institutions that offered distance education (Alavi, 1994; Palvia et al., 2018; Piccoli et al., 2001). Despite their limited capabilities at first, these platforms evolved with the advancement of technology. Educational platforms become more interactive, complex, and accessible. Virtual learning has gained widespread popularity today due to its

unmatched flexibility and the ability to enable students to learn from anywhere and at their own pace (Al-Rahmi et al., 2023; Ferrer et al., 2022; Li, 2022).

During the recent COVID-19 pandemic, transitioning to virtual learning environments presented higher education stakeholders and educators with new challenges in adapting instructional strategies by leveraging educational technology (Drigas et al., 2023; Zhu et al., 2023). To maintain student engagement and build meaningful network connections, educational technology became more complex and controversial without the benefits of in-person interactions. Virtual communication tools lacked the subtleties of in-person interactions, which could negatively impact effective teaching and learning (Bond & Bedenlier, 2019; Vezne et al., 2023). The struggle of educators to effectively leverage educational technology tools in higher education settings to foster student academic achievement and retention has become more pronounced with the expansion of virtual education (Babincakova & Bernard, 2020; Kardambikis & Donne, 2022). In the early stages, concerns primarily revolved around the novelty of the technology as educators and students navigated unfamiliar digital landscapes (Bond & Bedenlier, 2019; Drigas et al., 2023; Vezne et al., 2023; Zhu et al., 2023). As technology advanced and online courses became common, attention shifted toward optimizing the learning experience and ensuring students remained actively engaged in their studies (Drigas et al., 2023; Zhu et al., 2023).

In the digital age, the rise of social media platforms and communication tools has introduced a paradox (Matee et al., 2023). While individuals are more connected than ever, establishing authentic networks of connection within virtual educational settings remains challenging (Downes, 2019; Kostenius & Alerby, 2020; Hu et al., 2021). Research regarding student engagement issues has gained prominence as educators strive to bridge the gap between

technology-driven instruction and the network connections essential for meaningful learning experiences (Aluko et al., 2022; Eden et al., 2022; Lawrence et al., 2019).

The traditional face-to-face interactions that foster engagement and rapport are often absent virtually, which makes it difficult for educators to establish a sense of community and belonging among students (Bond & Bedenlier, 2019; Karakose & Demirkol, 2021; Lawrence et al., 2019). As educational institutions continue to invest in virtual learning, the need to address these challenges has become increasingly urgent (Kostenius & Alerby, 2020; Kuh, 2003). Researchers and practitioners recognized that lacking student engagement and network connections can hinder learning outcomes, retention rates, and overall satisfaction with virtual courses (Leslie, 2020; Li, 2022; Matee et al., 2023).

Social Context

The emergence of the COVID-19 pandemic in early 2020 forced educational institutions worldwide to transition promptly to remote learning (Alisemiel et al., 2022; Means & Neisler, 2020). This abrupt shift highlighted the importance of harnessing technology in online learning contexts (Li, 2022; Turan et al., 2022; Wei & Chou, 2020). Many educational professionals encountered challenges when integrating technology effectively to promote student engagement and establish meaningful human connections (Li, 2022; Tight, 2020; Turan et al., 2022). By recognizing the potential disparity between online learning environments and the unique needs of individual students, educational technology became crucial (Alisemiel et al., 2022). Various studies (Alisemiel et al., 2022; Ferrer et al., 2022; Lawrence et al., 2019) demonstrated that some students thrive in technologically enhanced learning settings, while others experience decreased motivation and disengagement.

Consequently, disengagement among students was frequently associated with low

retention and graduation rates in higher education (Eden et al., 2022; Ferrer et al., 2022; Tight, 2020). As funding for higher education became more reliant on student and family contributions rather than state funding, the responsibility for student retention and engagement has also shifted from the student to the higher education institution (HEI) (Tight, 2020). There was potential for substantially enhanced student engagement and authentic network connections using technology within public institutions of higher education.

Theoretical Context

The theory of connectivism, initially proposed by Siemens (2004), stemmed from traditional learning theories of behaviorism, cognitivism, and constructivism by acknowledging the challenges and opportunities presented by the digital age. Connectivism emphasizes that learning is not just an individual process but relies on external networks of nodes like individuals, databases, and institutions (Siemens, 2004, 2005). To effectively acquire knowledge, learners must be able to navigate these networks. Educational technology was a crucial tool in this process, which helped to facilitate access, construction, and navigation of networks (Siemens, 2005). When properly used, technology could increase student engagement, promote cooperative learning, and accommodate diverse learning needs, thus improving academic performance (Siemens, 2006). Connectivism drew attention to the importance of external connections and networks in acquiring and applying knowledge and accentuated the interdependent relationship between technology and modern learning.

Multiple recent research studies accentuated connectivism theory to investigate various aspects of educational environments, such as relationships, engagement, and other relevant themes (Li, 2022; Tight, 2020; Turan et al., 2022). These studies provided a comprehensive overview of educators' challenges in using technology to engage students and develop genuine

interpersonal connections. The emerging consensus highlighted the importance of acknowledging that online learning environments may not be universally effective for all learners. While some individuals demonstrated notable achievements within these digital frameworks, others experienced decreased desire and involvement (Eden et al., 2022; Ferrer et al., 2022; Lawrence et al., 2019). Therefore, connectivism theory was increasingly crucial in improving pedagogical tactics and educational frameworks that effectively address the wide range of student demands and outcomes.

Several studies have examined student engagement, educational technology, and the perspectives of educators (Annansingh, 2019; Bolliger & Halupa, 2018; Fox, 2019). The research highlighted practical ways to enhance student engagement and learning outcomes by leveraging educational technology and online communication in higher education delivered at a distance (Bond & Bedenlier, 2019; Eden et al., 2022; Vlachopoulos & Makri, 2019). Bond and Bedenlier (2019) explored how educational technology can enhance student engagement. In contrast, Vlachopoulos and Makri's (2019) research focused on online communication and interaction in higher education at a distance. Bond and Bedenlier's (2019) framework focused on several key aspects, including integrating technology tools like LMS, multimedia, and interactive content.

The research also promoted student-centered activities and collaborative initiatives to employ technology and provide timely feedback, self-assessment, and reflection (Bond & Bedenlier, 2019). A study by Eden et al. (2022) also emphasized communication channels, promoting student-teacher and peer interactions through diverse communication channels. Personalization is a crucial factor, and customized learning experiences based on individual requirements and preferences were emphasized. Digital assessments were also used to aid in skill

development and knowledge acquisition.

Vlachopoulos and Makri's (2019) research structure has used platforms like Zoom, which features real-time lectures, discussions, and immediate feedback. Asynchronous communication tools like message boards, discussion forums, and email have also been used for deliberate participation. Cloud-based services have been used for collaboration, co-authoring, and document sharing. Webinars and guest speakers have provided interactive sessions and insight, while peer interactions, group activities, and collaborative endeavors are emphasized. Multimedia integration is used to increase engagement with videos, simulations, and assessments. Real-time and self-paced learning is balanced through synchronous and asynchronous learning. Online office hours provided virtual assistance and prompt responses to student inquiries. Online assignment/exam submission tools with prompt responses are used for assessment and feedback. Accessibility and inclusion were also emphasized to ensure all students can access resources. Both studies examined the influence of educator presence, responsiveness, and availability in online learning environments on student engagement and satisfaction. Additionally, researchers are identifying strategies to overcome the challenges educators encounter in building interpersonal relationships in online classrooms (Bond & Bedenlier, 2019; Mebert et al., 2020; Wei & Chou, 2020; Vlachopoulos & Makri, 2019).

This study focuses on integrating Siemens's connectivism theory (2004) to analyze the nature of educators building network connections to effectively leverage educational technology for fostering student engagement and academic achievement in connectivism principles. By doing so, the study aimed to contribute significantly to the existing knowledge in this field regarding educational technology and connectivism theory. This research study combined transcendental phenomenology and connectivism to explore the experiences of educators in

higher education leveraging educational technology (Moustakas, 1994; Siemens, 2004). This approach considered connectivism learning principles and processes that reflect the underlying social environments for fostering student engagement and academic achievement in higher education learning environments.

Through the use of the connectivism principles, the research aimed to provide a comprehensive and nuanced understanding of the experiences of educators as they use educational technology. This research study used an evolving methodological approach that combined contextual knowledge of connectivism with experiential insights of phenomenology to strategically align with the eight connectivism principles outlined by Siemens (2004, 2005, 2006). The study included participants with varied educational and technical backgrounds to collect a wide range of viewpoints, which enhanced the overall learning experience documented in the research. The research investigated the strategies educators used to establish connections with different nodes, including academic publications, peer networks, and technology tools. These connections enabled educators to access specialized knowledge that contributes to improving teaching and learning processes. The study extended beyond human-centered learning experiences to examine how knowledge was acquired and used by implementing educational technical tools and databases.

This research focused on how much educators incorporated information from various domains and ideas to emphasize the interdisciplinary nature of modern educational paradigms. The study emphasized the importance of obtaining current and up-to-date knowledge due to the rapidly changing landscape of educational technology. Additionally, the study concentrated on how educators navigated their professional and informational networks to make informed decisions. This method further supported the idea that decision-making is a valuable form of

learning. The research provided a comprehensive and comprehensive understanding of educators' experiences as they used educational technology. This methodology provided valuable insights that can significantly influence instructional practices and educational policies.

A phenomenological approach allowed for an in-depth examination of the experiences and perceptions of educators using technology to foster student engagement and network connections. Through the principles of connectivism and educational technology, this study presented valuable insights into the field of education while informing pedagogical practices for increasing student engagement and academic achievement. Moreover, the essence of connectivism emphasized the importance of networks, current knowledge, and the interconnectedness of information in the digital age, which helped to understand how technology can accommodate these needs or address present challenges in higher education learning environments (Siemens, 2006). Additionally, this study contributed valuable information on how technological means and LMS affect the development of pedagogical practices while following connectivism principles.

Problem Statement

The problem is that educators struggle to effectively leverage educational technology tools in higher education learning environments to foster academic achievement and retention (Lee & Kwon, 2023; Masenya, 2021; Tarazi & Ruiz-Cecilia, 2023). Educators' struggle to integrate educational technology adversely impacts teaching and learning, potentially compromising teaching effectiveness and students' learning experiences. (Haverila et al., 2020). The absence of technological integration could result in classroom experiences that were less engaging and inactive, reducing student interest and involvement (Haverila et al., 2020; McLure et al., 2022). Inadequate use of technology could impede the support of various learning styles,

which resulted in inadequately designed learning experiences and possibly led to diminished academic performance (Lowenahal & Lomellini, 2022).

Teachers' confidence levels in their instructional capabilities directly influenced their ability to engage in creative teaching methods. Insufficient confidence in using technology could lead to hesitation in integrating innovative educational technology tools, make it harder to acquire proficiency, and create a heightened discontent for embracing technological advancements (Lowenahal & Lomellini, 2022). The misalignment between technology purchases and their actual use in classrooms could result in financial losses for educational institutions stemming from unused technologies (Lehrman, 2023). Researchers Lowenahal and Lomellini (2022) asserted that institutions may encounter increased expenses related to supplementary training and support services required to enhance educators' competency in using technology to foster student engagement.

Retention rates have suffered when an engaging and technologically advanced learning environment was absent, which resulted in student dissatisfaction with their education and possibly contributed to increased attrition rates. Retention concerns could have detrimental effects on an institution's reputation and financial health and lead to a decline in tuition income and a possible decline in future enrollment (Ayanwale et al., 2023). Institutions that do not adequately use technology may have difficulties adapting to emerging pedagogical trends, diminishing their competitiveness. Educators' confidence was often associated with their competence, ease of technology use, and skills developed through training, practical exposure, and ongoing assistance (Baloyi & Malatji, 2023). When educators lack confidence in their capacity to use technology effectively, it may lead to limited or superficial utilization of available resources rather than harnessing them to their most instructional potential.

Finally, it was essential to consider the broader economic implications for educational institutions. Educational institutions allocated substantial resources toward implementing educational technology to enhance the learning experience and operational efficacy (Baloyi & Malatji, 2023; Cheng et al., 2019). Insufficient use of technology may have resulted in a reduced return on investment, which creates a financial burden that may otherwise be directed to areas that directly enhance student achievement and institutional performance (Mutanga & Molotsi, 2022). Higher education institutions needed to prioritize addressing these difficulties by offering instructors sufficient support and professional development opportunities.

Purpose Statement

The purpose of this transcendental phenomenological research study was to explore and describe the experiences of educators leveraging educational technology to enhance student academic achievement and cultivate network connections in higher education learning environments at public universities in the southern region of the United States. At this stage in the research, the study's central phenomenon was defined as the application of educational technology as leveraged by educators at public universities in the southern region to enhance academic achievement and promote connectivism networks in higher education learning environments. Preceding studies have explored the use of technology by educators to build an engaging learning environment that fosters positive relationships between teachers and students (Donham et al., 2022; Haverila et al., 2020). Donham et al. (2022) highlighted educators' need to re-assess their teaching methods and actively seek the most effective approaches to promote student learning and engagement, especially considering the pandemic. As a result, many instructors have embraced student-centered teaching practices and explored new technologies

and instructional resources (Alzain, 2019). Researchers Bond and Bedenlier (2019) asserted that motivation and involvement determined student engagement within their learning community.

Educators must consider cognitive, behavioral, and emotional traits that influence internal and external factors, including individual interactions, teaching methods, and the classroom environment. Educators must establish a classroom environment that values and respects students to properly evaluate student engagement and motivate them to invest their energy into their coursework (Kallunki et al., 2023). By doing so, they could achieve immediate and long-term advantages and reignite students' interest in learning. There was a significant deficiency of research regarding leveraging educational technology to create meaningful connections between educators and students in higher education. Student engagement was becoming increasingly crucial for academic success, making it a pressing issue that must be addressed. There has been extensive research on educational technology and online learning but little investigation into how educators could effectively engage with students in a digital environment. The main goal of this research study was to address this disparity in the current body of scholarly literature.

Significance of the Study

The relevance of this study presented in its examination of the application of connectivism principles in educational technology to enhance student engagement and academic achievement, which is crucial for promoting higher education retention. The study explored connectivism as a comprehensive learning theory highlighting the importance of networks and information dissemination. It provided new insights into educational processes in the digital age. It used empirical methods to expand on previous research and examine the influence of technology and networks on promoting an interactive and productive educational environment. The objective was to address the deficiencies noted in the current body of literature.

This research study comprehensively examined educators' experiences using educational technology in higher education, focusing on its potential to foster enhanced interpersonal connections and facilitate a collaborative learning atmosphere. This study provided a dual contribution to academic discourse. First, it provided an empirical investigation of connectivism in the context of higher education, which is a suitable setting for this research due to the widespread integration of technology in contemporary teaching methods. Secondly, this research produced practical and applicable insights that have the potential to inform policy and practice. These insights may have assisted educators in effectively using technology to improve academic achievement and promote student engagement. Therefore, Moustakas' (1994) phenomenological technique provided the foundational structure for data analysis, while connectivism is the theoretical perspective that enhances the depth and specificity of interpreting the study results.

The primary goal of this integrated approach was to develop a comprehensive and resilient understanding of the subject matter under investigation, while making valuable contributions to both the theoretical and practical aspects of education in technology-enhanced settings. The implications of this study are extensive, as it may offer educators, policymakers, and stakeholders a foundation embedded in data to incorporate connectivism concepts with technology innovations to reimagine student learning experiences. Therefore, this research study is a significant reference point for continuing discussions around the combination of educational technology and connectivism (Annansingh, 2019; Bolliger & Halupa, 2018; Fox, 2019; Mshayisa & Ivala, 2022).

Theoretical

This study was significant in educational research as it explored the perspectives surrounding connectivism, a contemporary theory of learning, and the use of educational

technology in higher education. George Siemens proposed the theory of connectivism in 2004, which asserted that learning occurs through a network of connections in the digital era. This theory emphasized recognizing patterns within a complex information network rather than acquiring knowledge (Siemens, 2004). This study endeavored to expand the research concerning the theoretical framework of connectivism by exploring the practical implementation of connectivism principles through the experiences of educators using educational technology. Previous research studies have mainly focused on isolated aspects of online education and have disregarded attention to the interconnected contexts that are fundamental to cultivating connectivism theory's relationship-building component. The primary objective of this research was to broaden the conceptual foundations of connectivism by proposing practical, technology-driven approaches that promote effective human connections in online environments. There was a tremendous gap in the research regarding how technology connected and facilitated these vital relationships, and thus, the gap merited further investigation.

Empirical

While prior research has discussed the theoretical underpinnings of connectivism, there continued to be an absence of empirical research that demonstrated the actual implementation of these ideas in the context of educational technology (Mebert et al., 2020; Lawrence et al., 2019). This study presented the potential of technology in facilitating the creation and development of educational networks and enabling influential information sharing, which are fundamental principles of connectivism. Furthermore, this research study endeavored to make a significant contribution to the field by examining the efficacy of educational technology in promoting student engagement and academic achievement. This study presented a comprehensive approach that differentiates it from previous research, which primarily focused on isolated variables or

elements of the technological educational experience. This fragmented approach, however, failed to consider the interrelated nature of learning as advocated by connectivism. Therefore, this study aimed to address a notable gap in the literature by collecting empirical data to explore the practical implementation of connectivism principles through educational technological tools.

Practical

As human interaction is crucial in higher education learning environments, this research study offered significant contributions to technology-based education and student academic achievement. The research emphasized the importance of establishing meaningful networks between educators and students in virtual higher education settings (Katai & Iclanzan, 2023; Muljana & Luo, 2019; Tuiloma et al., 2022). The study assessed the data obtained from educators with expertise in various technological devices and methods used in diverse educational contexts to provide valuable insights into their effectiveness. Amid the COVID-19 pandemic, there has been a significant increase in the adoption of virtual learning. However, there was a need to establish a research-based framework that encouraged human interaction through connective learning nodes in higher education learning environments. Connectivism ensures that the education sector has a well-defined strategy that could lead to optimal student outcomes and retention rates. Additionally, the study aimed to enhance the evaluation of instructional technology to comprehend how different technologies facilitate or impede the connectivism learning process. This research has the potential to revolutionize educational technology in higher education and has practical implications for designing virtual learning experiences. Furthermore, the study's influence extended beyond academia to policy and practice. Without empirical data, judgments in this context may have lacked a solid foundation,

which could have resulted in suboptimal resource allocation or supporting projects that do not improve learning outcomes and student engagement.

Research Questions

The purpose of this transcendental phenomenological research study was to explore the experiences of educators leveraging educational technology to enhance student academic achievement and cultivate network connections in higher education learning environments at public universities in the southern region of the United States. The study focused on the lived experiences of educators in the southern region of the United States within public university settings who leverage educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments. To thoroughly understand the leveraging of educational technology and increasing student engagement relations, the study posed a central research question and three subsidiary questions to examine different facets of the educational technology environment and how they aligned with connectivism principles. The study aimed to answer these questions to gain insights into the use of educational technology in higher education and its effect on student academic achievement.

Central Research Question

How do educators at public universities in the southern region of the United States describe their lived experiences with leveraging educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments?

Sub-Question One

How have educational technology tools and connectivism practices been perceived to influence student engagement and academic achievement in higher education learning

environments?

Sub-Question Two

How do educators conceptualize and articulate their comprehension of the development of connectivism over time within academic discourse in higher education?

Sub-Question Three

How do educators envision the future of teaching approaches in higher education, considering the influences of technology innovations and the increasing focus on connectivism?

Definitions

The following terms were essential to understanding the context of terms pertinent to the experiences of educators leveraging educational technology to foster student engagement and academic achievement, emphasizing the principles of connectivism in higher education learning environments.

1. *Chaos* - A complex pattern that initially appears disorderly due to its unpredictable nature (Siemens, 2004).
2. *Emotional Intelligence* - The ability of students, educators, and other academic community members to comprehend, regulate, and express emotions effectively (Drigas et al., 2023).
3. *Learning Management Systems* - Software applications employed by higher education institutions to offer online programs, materials, and resources (Vlachopoulos & Makri, 2019).
4. *Network* - Connections between entities. Entities can be connected to create integrated systems, such as computer networks, power grids, and social networks (Siemens, 2004).

5. *Nodes* - Distinct entities or separate points of various sources of information and platforms, including individuals, groups, institutions, databases, and websites that connect and store information in a network (Siemens, 2004).

Summary

This transcendental phenomenological research study explored the experiences of educators leveraging educational technology to enhance student academic achievement and cultivate network connections in higher education learning environments. The problem was educators who struggled to effectively leverage educational technology tools in higher education learning environments to foster student academic achievement and retention (Lee & Kwon, 2023; Masenya, 2021; Tarazi & Ruiz-Cecilia, 2023). Addressing this challenge regarding leveraging educational technology to facilitate and enhance student engagement and academic achievement, the research has gained significant attention (Donham et al., 2022; Kaewsaiha & Chanchalor, 2021). The study incorporated Siemens's (2004) connectivism theory to provide a theoretical framework for understanding the nature of the experiences (Siemens, 2005, 2006). By adopting a transcendental phenomenological approach, the research sought to gain profound insights into educators' lived experiences, perceptions, and challenges in employing technology to create meaningful connections with students in higher education learning environments (Moustakas, 1994).

The study reviewed existing research on online education, technology integration, student engagement, and network connections to establish the theoretical context and identify gaps in the literature. The goal was to contribute valuable insights for enhancing innovative educational practices and advancing the field of connectivism in higher education. Additionally, the research aimed to identify critical factors influencing the success of leveraging educational technology for

student engagement and academic achievement. The study sought to provide insight into specific technological devices, pedagogical strategies, and instructional design elements that educators found most effective in fostering student engagement and developing networks in higher education learning environments (Cui, 2022; Hagenauer et al., 2023; Hill et al., 2021). The study's findings have the potential to benefit educators, institutions, and technology developers by providing practical recommendations for improving online teaching practices and designing more effective virtual learning platforms. Moreover, this study could contribute to the theoretical understanding of human interactions in the context of educational technology by enriching and expanding the existing literature on technology integration and its influence on student engagement and learning outcomes in higher education.

CHAPTER TWO: LITERATURE REVIEW

Overview

A literature review was conducted to explore the experiences of educators at public universities in the southern region of the United States who leverage educational technology to improve academic achievement and student retention. Specifically, the study investigates Siemens's (2004) connectivism theory, which highlights the significance of the connectivism lens of networks, contemporary knowledge, and interrelated information in the digital era of higher education learning environments. This chapter explored current research literature on leveraging technology and connectivism principles for fostering student engagement and academic achievement. First, the concepts of Siemens's (2004) theory of connectivism relevance to educational technology integration and networks to increase student engagement and academic achievement are presented, followed by a synthesis of current literature on the effect of effectively leveraging educational technology and building learning networks through connectivism. Then, the research illustrated how higher education educators may implement technology to foster student engagement and academic achievement. Finally, a gap in the literature was identified regarding educational technology and connectivism for generating pedagogical learning and student engagement through network exchanges and instructional strategies for promoting academic achievement.

Theoretical Framework

George Siemens introduced the connectivism theory in 2004, which provided a crucial framework for examining the pressing issues of declining academic performance and rising attrition rates in higher education (Siemens, 2004). The perspective of connectivism theory was characterized by the following eight fundamental principles of learning: diversity of opinions,

connecting nodes, non-human learning, capacity over current knowledge, maintaining connections, interdisciplinary connections, emphasis on currency, and decision-making as learning (Siemens, 2004).

Siemens's Connectivism Principles

In the digital setting, the learning paradigm of connectivism was based on eight fundamental principles. These principles highlighted the importance of considering multiple perspectives, engaging with various sources of knowledge, and recognizing both human and non-human learning modes. The approach emphasized the need to acquire and integrate knowledge consistently while maintaining links to facilitate ongoing education and recognizing the interrelatedness of different disciplines and concepts. This framework also emphasized the significance of staying up to date with the progression of information and refining decision-making abilities and evaluation skills. Overall, these principles illustrated the complexity of learning in the era of digital technology, highlighting the influential and extensive characteristics of connectivism (Siemens, 2004, 2005, 2006).

These guiding principles were used to develop research questions that explore educators' experiences and perceptions of academic achievement and retention. Together, these principles formed the foundation of a connectivism approach and emphasized that learning is not limited to human cognition but extends through networks and organizations, which stressed the significance of connections, digital resources, and technology as integral enablers of the learning experience (Siemens, 2004; Siemens, 2005). By understanding the significance of Sieman's theoretical concepts, we comprehend how learners acquire, employ, and navigate knowledge in technologically advanced learning environments.

Stephen Downes (2022) expanded upon the connectivism theory, which aimed to address

the digital era's unique challenges and educational needs. The theoretical framework provided innovative insights into how learning can occur in networked contexts while drawing on fundamental educational and cognitive concepts. When designing instructional environments, three primary learning theories were commonly used: behaviorism, cognitivism, and constructivism (Siemens, 2004). However, these theories were developed before the significant influence of technology on education. Over the last two decades, technological advancements have significantly transformed all aspects of human life, including communication, education, and lifestyle (Siemens, 2006). Therefore, it was essential to consider the social context in which learning occurs when acquiring knowledge or understanding and understanding the principles and processes of learning.

The proposed research study used Moustakas' (1994) phenomenological approach as the methodological framework to guide the collection and analysis of data. The theoretical framework used for interpreting data was based on connectivism, as Siemens proposed in 2004. This research aimed to integrate Moustakas' (1994) approach with the theoretical premises of the connectivism lens to enhance qualitative data analysis. Although Astin's (1999) theory provided a fundamental framework for comprehending student experiences, it failed to emphasize the crucial significance of digital and technology components in contemporary education. Siemens's (2004) connectivism theory aimed to solve this limitation by emphasizing the role of technology in establishing linked learning networks. This approach offered a more complete framework for examining student participation in the context of the digital age.

The research investigated the experiences of educators implementing the principles of connectivism in planning, designing, and evaluating student academic achievement and, thus, contributed to a deeper understanding of the theory's relevance and applicability in modern

educational contexts. The study used connectivism theory to shape research questions, guide data analysis, and inform the reporting of results. The connectivism theory provided insights into the components leading to the formation of beneficial and sustaining academic achievement and decreasing attrition. By applying connectivism dimensions and extending its concepts to the digital learning environment, the study enhanced the theoretical understanding of how student academic achievement is fostered through technology in higher education settings. Educators may have explored using technology to foster virtual engagement to increase student involvement, collaboration, and communication.

Related Literature

Integrating asynchronous and synchronous digital technology into course design and pedagogy effectively was critical for student engagement, academic success, and retention (Chandrappa, 2018; Downes, 2022). However, there was limited research on how to achieve this integration. Educational institutions and their instructors needed to keep up with the latest technology and instructional practices to adapt to the rapidly expanding digital world. This research study addressed the literature gap by describing the lived experiences of educators at public universities in the southern region of the United States who leverage educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments.

The connectivism theory, developed by Siemens (2004), influenced this study's research questions, data analysis, and reporting of results. The study examined the principles of connectivism theory to guide and inform its exploration of how educators leverage technology to foster student academic achievement and enhance retention in higher education learning environments. Connectivism theory provided a comprehensive approach to developing the

questions of this research based on the eight fundamental principles defined by Siemens (2004, 2005, 2006). Additionally, the theory emphasized the importance of collaboration and learning networks and stressed the need for diverse opinions, human interaction in learning, the ability to learn, fostering connections, creating links between ideas and concepts, updated and accurate knowledge, and decision-making (Downes, 2019, 2022).

This research study explored the related literature to support the implication of a combined methodology that merges the experiential insights of phenomenology and the contextual understanding of connectivism. The study focused on eight essential principles for effective learning (Siemens, 2004, 2005, 2006). The goal was to explore practical strategies to assist educators in prioritizing technology integration to improve academic achievement. This dual focus on technological integration and pedagogical enhancement formed the basis of the study, which aims to contribute significantly to the connectivism theory in educational technology and its relevance in contemporary academic settings. Furthermore, the overreaching objective of this research study aimed to enhance academic performance significantly and increase student retention rates in higher education institutions by achieving these objectives.

Connectivism of Student Engagement and Achievement

Higher education institutions face various challenges in their learning environments regarding student engagement and academic achievement (Nortvig et al., 2018; Tarazi & Ruiz-Cecilia, 2023). Academic performance decline and increased attrition rates were among the growing concerns (Nortvig et al., 2018). Previous studies have explored various aspects of academic achievement and technology integration, but there were significant gaps in the literature in addressing all the challenges comprehensively (Page et al., 2020; Paul, 2021; Ustun & Tracey, 2019). Most studies focus on specific obstacles educators face when integrating

technology, such as technical difficulties or resistance to change (Ustun & Tracey, 2019). However, there has been less exploration into how higher education faculty members can be supported in integrating asynchronous and synchronous technologies and strategies into course design and delivery to enhance student learning outcomes and academic achievement (Utecht & Keller, 2019).

The COVID-19 epidemic has profoundly influenced daily life, specifically interactions with others. The extensive use of technology during the epidemic enabled individuals to maintain contact with friends, family, and coworkers amidst social isolation. In the virtual setting, employing technology to develop human interactions has become crucial as society traverses the post-pandemic world (Kumari et al., 2021; Parker & Hodgson, 2020). Huda (2019) proposes that technology may be used in various ways to create and sustain connections. For starters, technology-enabled individuals to contact people regardless of location, which allowed them to communicate with friends and relatives who live far away and preserve ties with colleagues who work remotely. Kumari et al. (2021) suggested that technology could foster community and collaboration by facilitating shared experiences for interpersonal relationships and knowledge and asset sharing (Huda, 2019; Kumari et al., 2021; Parker & Hodgson, 2020).

The application of technology to enhance student engagement and academic achievement has gained popularity in recent years (Kostenius & Alerby, 2020; Leslie, 2020). As a result, empirical studies have focused primarily on how technology influences academic achievement and connections in education (Asif et al., 2021; Donham et al., 2022). Much of the research results indicated that technology may have beneficial and unfavorable consequences on academic achievement and attrition (Huda, 2019; Parker & Hodgson, 2020). Although substantial research existed on how technology may be implemented to build inclusive learning

environments and enhance student-centered learning, there was a possible lack in the literature exploring the use of technology for producing pedagogical connections and exchanges. Additionally, limited research offered instructional techniques for fostering student academic achievement by integrating technology with culturally responsive teaching practices.

Within educational concepts, Siemens' connectivism (2004) and Astin's philosophy of student engagement (1999) provide significant and complementary viewpoints about learning circumstances. Astin's (1999) and Siemens's (2005) concepts of student engagement shared a common goal of improving student learning and academic achievement. However, each theorist approached academic achievement from different perspectives. Astin's (1999) theory emphasized the significance of students' investment in their academic pursuits, extracurricular activities, and interaction with faculty members. Compared to Siemens' connectivism (2004), Astin's (1999) theory offered a comprehensive approach to assessing the effectiveness of educational policies and practices in promoting student engagement. According to Astin (1999), the more students were engaged in these areas, the better their learning outcomes and personal growth were. However, there was an area that required attention in higher education concerning the connectivism theory applied to knowledge dissemination (Siemens, 2004; Downes, 2019).

Researcher Stephen Downes proposed that connectivism may be used to improve student engagement and academic achievement through technology (Downes, 2022). Siemens's (2004) connectivism theory stood out among the educational theories as a framework explaining how learning occurs in a digital and interconnected world. The approach highlighted the significance of networks, connections, and technology as pathways for learning. In contrast to Astin's (1999) theory of student engagement, connectivism theory naturally incorporated the role of technology in facilitating the learning process and establishing networks of information and people, making

it a more comprehensive theory. While studies such as Chandrappa (2018) assessed the effectiveness of educational tools used in isolation, there was a lack of research on the cognitive and digital literacy skills required to use technology. This included understanding that digital tools are based on constantly evolving teaching methods and knowing how to incorporate them into various instructional environments (Chandrappa, 2018; Downes, 2022; Masenya, 2021).

The proposed research comprehensively examined educators' experiences and, specifically, focused on the lack of qualitative research that explored the insights from higher education faculty members' needs for support in incorporating asynchronous and synchronous technologies. This integration sought to improve student engagement, academic achievement, and attrition rates within the connectivism framework of technological advancements. This concentrated on the effectiveness of present faculty development programs in equipping educators with the necessary training to address the challenges posed by the digital age (Mullen, 2020). Educators must consider how students perceive and adapt to changes in teaching methods caused by technological advancements (Downes, 2022; Kostenius & Alerby, 2020; Leslie, 2020). Including the educators' perspectives in the research study revealed how technology directly influences academic performance and attrition (Njiku et al., 2019). By promoting diversity in educational settings, we understood that universities vary in their available resources, demographics, and goals. However, additional research was necessary on the diversity within these ecosystems, particularly concerning technology integration and its influences.

Blending Connectivism and Traditional Educational Theories

Due to technological advancements in the 21st century, the importance of connectivism in higher education has increased (Downes, 2019; Utecht & Keller, 2019). The connectivism approach highlighted the significance of collaborative and networked learning. Behaviorism,

cognitivism, and constructivism theories offered distinct viewpoints on learning. However, these theories shared the principle that learning leads to transformation, whether in behavior, cognitive frameworks, or acquired knowledge (Driscoll, 2000; Siemens, 2004). The variations between these concepts stemmed from the methods used to initiate, comprehend, and implement transformation (Driscoll, 2000).

Connectivism challenged traditional educational theories by proposing that learning is a collaborative effort rather than an individual cognitive process (Utecht & Keller, 2019). As educators, it was crucial that we comprehended and effectively implemented these concepts in various contexts to achieve optimal educational outcomes for our diverse student population, especially amid the constant changes in the higher educational environment. Siemens' conceptualization of connectivism aimed to bridge these gaps by emphasizing networks, digital platforms, and the external environment as crucial components of the learning process (Siemens, 2004).

According to Downes (2022), connectivism was a modern adaptation of established teaching methodologies tailored to meet the demands of modern learning environments. The theory combined principles from behaviorist, constructivist, and cognitive learning theories while considering the intricacies of knowledge acquisition in the digital age (Baque et al., 2020). Supported by Goldie's (2016) view, the framework offered a comprehensive understanding of learning by highlighting the importance of social and technical networks to address the limitations of previous theories. Connectivism is a modification or advancement that builds upon established educational theories to tackle challenges and opportunities in contemporary academic learning environments (Baque et al., 2020; Downes, 2022; Goldie, 2016).

Due to the widespread availability of online courses and digital platforms, educational

institutions are now expanding beyond physical classrooms (Mpungose & Khoza, 2022; Mullen, 2020; Utecht & Keller, 2019). Siemens's (2004) connectivism addressed the abundance of information online and accentuates the importance of external sources such as Massive Open Online Courses (MOOCs), open-access journals, and online forums to enhance traditional curricula (Jacobsen, 2019; Kim et al., 2020). Despite being a relatively newer and under-explored theory, connectivism has attracted significant attention as a conceptual framework for understanding how individuals learn in digital environments as opposed to traditional learning theories (Corbett & Spinello, 2020). It is worth noting that while digital technologies are frequently used in university sustainability education, connectivism has not yet received the recognition it deserves in this field (Abad-Segura et al., 2020; Rof et al., 2020).

Connectivism also highlighted the importance of digital literacy competencies and lifelong learning. Educational institutions must provide students with the necessary skills to engage in lifelong learning and adapt to the ever-changing nature of knowledge (Farhan & Alhalafawy, 2023). This approach involved acquiring specialized knowledge and developing the capacity to establish connections, critically assess, and integrate novel information from various sources (Dawo & Sika, 2021; Deaconu et al., 2022). Higher education institutions must frequently revise curricula to remain relevant amidst rapid technological advancements and global interconnectedness (Deaconu et al., 2022; Downes, 2022; Farhan & Alhalafawy, 2023).

Connectivism Promoting Learning Sustainability

Connectivism has emerged as a crucial educational concept that addresses the challenges and opportunities of technology in the education era. Introduced by George Siemens in 2004, connectivism revolutionizes the understanding and facilitation of learning. It suggests that learning occurs in a vast network of interconnected nodes, where knowledge is exchanged and

spread rather than confined to individual learners. This perspective is especially relevant in the current digital environment, where knowledge is dynamic and constantly changing, requiring learners to navigate complex information networks successfully. The application of this concept in higher education is influenced by George Kuh's findings in 2003, where he emphasized the critical importance of student engagement in promoting retention, satisfaction, and overall academic achievement.

Connectivism builds on these principles by using digital technology to create dynamic learning environments. Within these contexts, students transition from passive recipients of knowledge to engaged individuals who generate and produce. This transformation requires students to actively analyze, discuss, and participate in the subject matter, enhancing their learning experience. By actively engaging in this process, students acquire knowledge and contribute to generating new insights, collectively shaping their educational experiences (Kuh, 2003; Siemens, 2004). This integration of connectivism highlights a significant shift in educational paradigms, moving away from traditional, static teaching methods towards dynamic, interactive learning processes that align with technological and information advancements. Connectivism advocates digital technology to enhance educational outcomes by establishing an environment where learners actively participate in and contribute to the learning process. The approach makes learning more inclusive, interactive, and continually evolving (Al-Maawali, 2022; Downes, 2022).

Connectivism enabled connections among students, educators, and various sources of information, which highlighted the importance of active learning, collaboration, and using technology as a supportive instrument (Siemens, 2005). This viewpoint was consistent with Downes's (2022) argument that acquiring information was an ongoing and ever-changing process

shaped by several interconnected factors. In today's modern world, characterized by rapid technological progress and a surplus of knowledge, adjusting and participating in continuous learning was more crucial than ever to comprehend (Al-Maawali, 2022; Downes, 2022). Connectivism had the potential to not only enhance immediate student involvement in higher education environments but also to foster long-lasting sustainability in learning (Aldhafeeri & Alotaibi, 2023).

Connectivism Promotes Student Engagement

As Astin (1999) highlighted, peer involvement was vital in fostering student engagement. Connectivism pedagogy placed significant importance on the pivotal function of networks in the learning process, particularly the importance of networks formed among peers (Downes, 2019). Digital platforms such as online discussion forums, social media platforms, and collaborative wikis could serve as interconnected points where students can engage with one another, exchange perspectives, and enhance the student's understanding (Farhan & Alhalafawy, 2023). Active participation in learning communities is a critical aspect of academic engagement. It involved actively engaging with other learners and instructors to enhance the learning experience. Students may have deepened their understanding of the subject by actively participating in discussions, group activities, and collaborative projects.

Connectivism promotes students' active participation in formal and informal learning communities. According to Zhao and Kuh (2004), there was a positive correlation between such involvement and increased levels of student engagement. Integrating social aspects of LMS had the potential to foster collaboration among students, which expanded their learning networks beyond the traditional classroom setting (Dunaway, 2011). Personalized learning experiences were advocated by the connectivism perspective, which asserted that learners should be

empowered to shape their educational trajectories. Personalized learning experiences could have effectively addressed individual learners' unique interests and demands, resulting in heightened levels of engagement (Kim et al., 2020; Sayaf et al., 2021). Practical implementations of connectivism ideas that may significantly enhance student interest and engagement include adaptive learning systems, gamified courses, and student-led projects.

Connectivism Promoting Learning Sustainability

According to Siemens (2005), connectivism promoted the necessary abilities for students to actively participate in lifelong learning, which was a crucial factor influencing their sustained involvement in education. Huachara-Martinez et al. (2023) suggested that students enhance their preparedness for ongoing learning in an avid knowledge environment by acquiring the skill to establish connections with pertinent nodes within learning networks. Connectivism offered a comprehensive framework for enhancing student participation in higher education. Higher education institutions have had the potential to significantly improve student engagement by leveraging the advantages offered by digital networks, tailored learning experiences, and lifetime learning capabilities (Farhan & Alhalafawy, 2023; Huachara-Martinez et al., 2023).

Communication and Engagement

Leslie's (2020) research provides a practical example of connectivism in action, highlighting the efficacy of employing video technology to convey the instructor's presence and create a more personalized learning experience. By combining visuals, sound, and animation, videos could vividly illustrate concepts, teach steps, and engage learners effectively (Leslie, 2020; Louw & Barker, 2021). Video technology for communication allowed the instructor's presence to be conveyed and a more personal touch to be added (Leslie, 2020). In addition, research by Carr et al. (2021) revealed that successful college experiences are predicated on

developing solid interpersonal relationships. This study addressed the effectiveness of video technology in enhancing student engagement and fostering relationships in virtual classrooms. The research concentrated on educators' approaches to creating instructional videos that impart knowledge and establish a positive connection with their students.

Connectivism Benefits and Limitations

Connectivism became a popular learning theory in recent years due to its emphasis on networks, continuous learning, and technology's critical role in modern education (Downes, 2019, 2022; Utecht & Keller, 2019). Downes (2019) expanded on connectivism as a comprehensive context for comprehending the intricate nature of contemporary educational environments. Although the use of educational technology has the potential for many advantages, especially in facilitating interconnected, adaptable, and continuous learning, it is imperative for educators to be mindful of the possible disadvantages (Dawo & Sika, 2021; Dziubaniuk et al., 2023; Baque et al., 2020). There were various educational challenges, including cognitive overload, inequities stemming from the digital divide, and concerns about the adequacy of support and structure throughout the educational process (Downes, 2019, 2022).

Baque et al. (2020) claim the connectivism approach offered many benefits, such as its adaptability to the ever-changing technological landscape, which made it an effective method for modern digital learners. Supportive findings by Downes (2019, 2022) solidified connectivism and ensured that educational information remains relevant and practical to keep up with the ever-evolving nature of knowledge. While Dawo and Sika (2021) asserted that connectivism has advantages, there were some potential limitations. One challenge was the digital divide, which could have created disparities in educational opportunities for students with equal access to technology.

Additionally, Tarazi and Ruiz-Cecilia (2023) acknowledged that the abundance of online information could be overwhelming and make it challenging to distinguish between reliable sources. Despite these challenges, the connectivism framework encouraged cooperation and active participation in diverse networks by enriching the learning process and fostering a comprehensive understanding of topics. Therefore, it was essential to balance the benefits and disadvantages of connectivism and ensure its fair and thorough use in educational environments (Baque et al., 2020; Dawo & Sika, 2021; Tarazi & Ruiz-Cecilia, 2023).

Connectivism Benefits

As a pedagogical framework, connectivism recognizes the importance of interconnected interactions and the ability to adapt to a rapidly evolving information environment (Downes, 2022). Networked learning is facilitated by educational practices recognizing the value of linked interactions between learners, educators, and resources, significantly influencing the learning process. The flexibility discussed here addressed the challenges traditional educational approaches face when accommodating the ever-changing nature of the information. In addition, connectivism promoted lifelong learning and shifted the focus from accumulating a static body of information to active participation in a continuous learning process (Siemens, 2004, 2005).

The connectivism shift was significant in an age characterized by overwhelming knowledge (Downes, 2022). Recognizing that ability to evolve constantly, the connectivism approach fostered a culture that emphasized the ongoing pursuit of knowledge. Moreover, the connectivism paradigm acknowledged the importance and validity of informal learning encounters (Downes, 2022). This perspective expanded the scope of conventional education by recognizing and incorporating the many ways people acquire and interpret information in the digital age, such as social media platforms or specialized online forums. Connectivism provided

a forward-thinking and all-encompassing approach to learning, which aligned with the demands and circumstances of today's educational landscape (Downes, 2022; Siemens, 2004, 2005).

Connectivism Limitations

The theory of connectivism was an innovative approach to learning in the digital age, but it also presented some challenges that could hinder the learning experience (Downes, 2022). One of the most significant obstacles was cognitive overload, which could occur in a digital and networked environment (Mullen, 2020). With abundant information and possible connections, learners may have experienced being overwhelmed, which resulted in a compromised learning experience (Johnson & Welsch, 2020). The vast amount of knowledge available may also have undermined the efficacy of the theory as learners struggled to comprehend and integrate the information. Another crucial issue that requires attention is the digital divide. Connectivism assumes that technology and digital resources are universally available to all learners, but this is not always true (Dawo & Sika, 2021). The digital divide posed a substantial obstacle, especially within educational environments with resource constraints. Inadvertently, the division could have unintentionally undermined the inclusiveness of the learning approach.

Critics argued that connectivism needed to adequately prioritize human supervision's role (Wylie, 2023). While the theory advocates for individual learning, critics contended that it fails to acknowledge the pivotal significance of instructors and organized learning settings (Page et al., 2020). Page et al. (2020) argued that insufficient attention to human supervision may have resulted in fragmented and shallow learning experiences, as learners may have needed the depth and contextual understanding generally offered by teachers. Finally, the dispersion of power and knowledge, a defining characteristic of connectivism, may have led to uncertainty and a shortage of organization within the educational setting. The process of decentralization may be

disconcerting for many individuals, especially those who excel in educational environments that are more planned and disciplined. The lack of a distinct hierarchy and well-defined paths may have provided difficulties for these learners in efficiently navigating the learning process.

Digital Literacy

Educators in HEIs face significant pressure to integrate digital technologies to enhance teaching and learning (Masenya, 2021). Research indicated that many educators lack the abilities, expertise, and self-assurance to effectively integrate technology into their instructional practices (Lowenahal & Lomellini, 2022; Masenya, 2021). This deficiency in instructional design skills was a significant obstacle to technology integration (Koh, 2019). Educators encountered challenges in selecting appropriate technological tools based on subject matter, instructional setting, student attributes, and cultural considerations (Njiku et al., 2019). Researchers such as Kopcha et al. (2020) have noted that educators recognize the importance of integrating technology following established standards and learning goals. However, adopting technology presented a significant challenge for educators, as Kopcha et al. (2020) emphasized.

As educators embraced the digital revolution, they needed to transition from traditional didactic methods. Educators transformed the educational landscape when adopting e-learning tools, including social media, online games, multimedia, and various mobile devices (Masenya, 2021). However, effective integration required educators to possess digital literacy skills and encompass the proficient use of Information and Communication Technologies (ICTs) for information retrieval, evaluation, creation, and communication (Paul, 2021). By acquiring technology skills, educators fostered informal learning in digital communities and bridged competency gaps. However, equipping educators with these skills remained a persistent challenge, which emphasized the need for collective efforts from the global education and

telecommunications sectors to address digital divide issues (Masenya, 2021; Paul, 2021).

Experts suggested that incorporating technology and developing skills to connect with others could significantly enhance student engagement in higher education (Asif et al., 2021; Donham et al., 2022; Masenya, 2021). To accomplish this objective, it was highly recommended that teachers incorporate technology into their teaching methods and develop virtual spaces that promote teamwork, communication, and active participation. (Donham et al., 2022). Additionally, Eshelman and Hogue's (2023) research findings provide evidence that a comprehensive approach combining TPACK (Technological, Pedagogical, and Content Knowledge), the Triple E Framework (Engagement, Enhancement, and Extension), and the CAFE model (Content, Activities, Facilitation, and Evaluation) were effective in enhancing the process of lesson planning in educational settings.

Educators could have established a more personalized, dynamic, and inclusive learning environment by implementing pedagogical strategies that promote interpersonal relationships and employ technology to enhance student engagement (Asif et al., 2021). Through enhanced communication, collaboration, and reflection, technology could have helped educators to establish meaningful connections with their students to have higher rates of engagement and improved learning outcomes (Asif et al., 2021; Donham et al., 2022). Therefore, it was recognized that technology has the potential to improve student engagement and can be leveraged to enhance the quality of education.

Education and Experience

Higher education institutions were adapting to a digital academic environment that departed from the conventional educational framework (Masenya, 2021; Paul, 2021). Educators today must thoroughly understand digital tools, platforms, and innovative teaching methods to

effectively cater to modern students' needs. According to a study conducted by Kim et al. in 2020, digital literacy, knowledge of e-learning platforms, and familiarity with the technical preferences of contemporary students were of utmost importance. The digital era has brought about significant societal transformations, especially in technology. Therefore, educators must have engaged in hands-on technological experiences designed for educational settings. With expertise in various areas, including LMS, virtual pedagogical environments, multimedia information curation, and the use of social media as an educational tool, educators could facilitate the integration of digital instruments in the field of education (Kim et al., 2020; Masenya, 2021).

The focus on technology in education encompassed not just instructional methods but also assessment practices, feedback mechanisms, and broader channels of educational communication. The determination to sustain the competitiveness and relevance of higher education institutions in the global educational landscape drove the incorporation of digital tools. Additionally, Lee and Kwon (2023) indicate an emerging demand to meet the educational needs and expectations of digital natives of students who have grown up in a digital environment and have distinct learning expectations. Incorporating digital technologies in HEIs presented a range of obstacles and opportunities (Johnson & Welsch, 2020). The proficient use of these technologies could have facilitated improved student engagement, personalized learning trajectories, and an expanded pedagogical scope beyond the limitations of conventional classroom settings. Continuous professional development, flexibility, and awareness of changing educational principles were essential for educators to drive the transformative process of the digital revolution (Koh, 2019; Koh & Kan, 2021).

Technology was vital for instruction, assessment, feedback, and communication (Lee &

Kwon, 2023). There were various reasons for integrating digital technologies (Paul, 2021). One factor presented by Lee and Kwon, 2023 was institutional pressure to remain relevant and competitive in the global education market. On the other hand, researcher Masenya (2021) asserted there is a need to accommodate students who are inherently familiar with digital technology, known as digital natives. Students have distinct expectations shaped by their upbringing in the digital era (Paul, 2021). To integrate digital technologies, educators presented both challenges and opportunities. When implemented proficiently, these technologies could enhance student engagement, facilitate personalized learning, and expand the classroom's scope. However, successful implementation of these tools required ongoing professional development, adaptability, and acknowledgment of the dynamic nature of education (Masenya, 2021; Paul, 2021).

In recent years, the use of technology in education has expanded in popularity, which provided new opportunities for students and educators to build interpersonal relationships (Kostenius & Alerby, 2020; Leslie, 2020). Kostenius and Alerby (2020) and Leslie (2020) were two significant studies investigating the use of technology for this objective. In online and mixed learning contexts, Kostenius and Alerby (2020) underline the need to foster the health and well-being of students and educators. The researchers contended this was possible by using a variety of technical instruments, including online forums, video conferencing, and social media. In addition, implementing technologies may have enhanced interpersonal interactions and collaboration between students and educators, therefore, educators contributed to developing an increasingly caring, supportive, and engaging learning environment for both self and group understanding (Kostenius & Alerby, 2020).

Leslie (2020) focused on online faculty development for student engagement using technology in educational settings to improve interpersonal interactions. Through contending that faculty saw increased student involvement, satisfaction, learning, and accomplishment in courses delivered using various technologies, this research illustrated technology's potential to improve interpersonal interactions in education. By harnessing technology tools and platforms, educators may have built more supportive and engaging learning environments to foster interpersonal relationships and empathy among students and instructors. Conversely, it was critical to note that technology alone is insufficient for fostering profound connections between students and instructors. Educators must also develop a culture of inclusiveness and support (Kostenius & Alerby, 2020; Leslie, 2020).

Technology and Soft Skills

As technology advances, so does its influence on relationships and education. Many educators have had opportunities to seek professional development in technology used to improve academic attainment, attendance, motivation, engagement, and communication (Donham et al., 2022). Currently, enrolled college students aged 18–23 were described as technologically dependent and have never known a world without it (Asif et al., 2021; Donham et al., 2022). The necessity to live in an increasingly connected and interdependent society seemed to exist today (Hye et al., 2020; Springett et al., 2022). Students seemed to face increased stress and anxiety when away from their technological devices (Huda, 2019; Parker & Hodgson, 2020).

Research revealed that educators who employ technology to develop interactive and stimulating activities requiring students to cooperate and interact in various curricula increase student involvement, collaboration, and communication (Avsec, 2023; Kraiger et al., 2022). For

instance, educators may have taught students about a specific topic using instructional games or simulation software (Avsec, 2023). Alternatively, they could have invited students to collaborate on a project using interactive communication platforms. Using a variety of instruments and platforms, educators leveraged most of their features and capabilities, cultivated a sense of belonging among students, and maintained a balance between in-person interactions and technology have proven to be a few successful strategies (Huda, 2019; Hye et al., 2020).

Integration to Improve Social Skills

The increasing prevalence of students' everyday usage of digital technology in the classroom has emphasized the need for individualization and diversity in higher education. Students have often engaged in active social interaction, information access, and entertainment. However, research by Hye et al. (2020) indicated that digital technology is often unrelated to academic literacy, and educators rarely use technology to its full potential in the classroom. Despite the potential benefits of digital technologies in education, Springett et al. (2022) accentuated that senior educators exhibited the lowest percentage of possessing technological skills and Internet usage among age groups, which stressed the crucial need for improving digital literacy to effectively implement these technologies in the classroom. Employing technological means for knowledge management and retrieval for communicating with others in educational environments may have helped improve integration and social skills among educators and students (Hye et al., 2020; Springett et al., 2022).

Emotional Intelligence Through Technology

In recent years, technology has fostered interpersonal interactions and enhanced empathy and emotional intelligence (Hafiz Muhammad et al., 2022). Researchers have investigated numerous technology systems, such as virtual reality and social media, to promote emotional

intelligence and interpersonal interactions (Birkbeck et al., 2020; Hafiz Muhammad et al., 2022). As technology advances, educators may have expected to see even more creative strategies to enhance interpersonal relationships and emotional intelligence. Due to a desire to emphasize the relational components of their profession, Birkbeck et al. (2020) discussed the growing evidence of dwindling recruitment and retention rates and increased stress among expert educators. Implementing technology created a simulated environment where instructors could communicate with peers and students who are purely digital representations (Hafiz Muhammad et al., 2022). The research discovered that implementing virtual reality increased the educator's capacity to perceive and articulate emotions and sympathize with their peers and students (Birkbeck et al., 2020; Hafiz Muhammad et al., 2022).

Educators to Student Engagement

Research supported the relevance of fostering emotional intelligence and soft skills among instructors and students (Estrada et al., 2021; Kastberg et al., 2020). Colleges and universities may have better-prepared students for a lifetime of professional success and gratification by providing opportunities to develop emotional intelligence through exposure to interpersonal experiences and technology applications (Kastberg et al., 2020). To foster emotional development among educators, students, and institutions may have needed to enhance their abilities and performance in building interpersonal relationships and collaborative environments (Kastberg et al., 2020).

Another pivotal aspect concerning the significance of fostering interpersonal relationships between educators and students laid in the revelation from research that the cultivation and sustenance of positive teacher-student relationships necessitated active engagement from both parties, as underlined by Carr et al. (2021), Cui (2022), and Tormey

(2021). Cui (2022) further asserted that interactions between educators and students played a pivotal role in shaping instructors' well-being and influencing their emotional state, including feelings of exhaustion and enthusiasm. The establishment of positive relationships fostered a supportive educational environment and acted as a buffer against emotional exhaustion. It promoted job satisfaction and incited educators' passion, which accentuated the imperative of nurturing these connections to cultivate an effective teaching and learning environment.

Conversely, as presented in two studies by Taxer et al. (2019), additional research highlighted the indirect influence of teacher-student relationships on teachers' emotional exhaustion. These studies revealed that relationship quality influences teachers' enjoyment and resentment experiences within the classroom. This interaction between positive teacher-student connections and emotions of enjoyment and anger ultimately shielded educators from emotional exhaustion and promoted their overall well-being, as echoed by Cui (2022) and Taxer et al. (2019). This collective body of research revealed the multi-dimensional significance of strong educator-student relationships in shaping the emotional environment of both teachers and students. Ultimately, emotional intelligence contributed to a healthier and more productive educational environment.

Recent research by Tormey (2021) inquired into the affective dynamics between students and educators within higher education by employing a theoretical model that underscores three essential dimensions: affection/warmth, attachment/safety, and assertiveness/power. These dimensions were quantified by applying the Classroom Affective Relationships Inventory. The affection/warmth dimension encompassed positive emotions like sociability, empathy, and compassion and fostered a deep emotional connection between students and instructors. This dimension scrutinized how instructors' tenderness and concern influence students' classroom

engagement and overall well-being. In parallel, the research of Taxer et al. (2019) revealed that the attachment/safety dimension focuses on nurturing students' trust and feelings of security with their teachers, which involved a sense of support and respect. A strong sense of attachment and safety sets the stage for an optimal learning environment, and enhanced class participation, sustained engagement, and motivated active involvement (Tormey, 2021).

Fostering Peer-to-Peer Engagement and Mentoring

Through employing technology to facilitate peer-to-peer interaction and mentorship educators may have had an effective strategy to enhance student engagement and strengthen interpersonal relationships and skills while establishing a beneficial learning environment (Chiemela et al., 2022). However, employing technology needed to be deliberate and methodical (Springett et al., 2022). Studies indicated that promoting peer-to-peer interaction and mentorship through technology may effectively achieve student engagement objectives (Chiemela et al., 2022; Springett et al., 2022). Employing online discussion forums to facilitate peer-to-peer interaction and mentorship was encouraged to enhance student engagement and foster interpersonal relationships (Chiemela et al., 2022). Additionally, research suggested that virtual communication platforms enable students to articulate their thoughts, stimulate discussion, and generate peer assessment (Chiemela et al., 2022; Springett et al., 2022).

While distinct studies such as Leslie (2020) and Louw and Barker (2021) employed varied theoretical models and methodologies to explore the significance of interpersonal peer-to-peer relationships, a contemporary trend in recent years was integrating technology to enhance and maintain these connections. This technologically driven approach, highlighted by Cui (2022), Taxer et al. (2019), and Yeung et al. (2023), enhanced communication, collaboration, and interaction between instructors and students. This seamless fusion of technology into the

educational setting fostered heightened connectivity, which ultimately nurtured a stronger sense of relationship and engagement between both parties. Addressing this challenge by leveraging educational technology to facilitate and enhance student engagement and academic achievements, this method has gained significant attention (Donham et al., 2022; Kaewsaiha & Chanchalor, 2021).

Eden et al. (2022) research revealed that implementing directed learning approaches can enhance critical thinking, problem-solving, and deeper cognitive engagement. These competencies were crucial for success in higher educational environments (Eden et al., 2022; Hagenauer et al., 2023; Haverila et al., 2020). Digital tools offered immediate feedback and evaluation, which supported educators in customizing their teaching methods to ensure the most effective learning paths for students. Despite extensive research on technology in higher education, the use of educational technology to develop connectivism network connections to increase student engagement, academic achievement, and retention had not been thoroughly investigated.

Connectivism Across Disciplines

Cultivating empathy and emotional intelligence through technology implementation was a rapidly growing field of study in higher education. Suarta et al. (2022) and Zhoc Karen et al. (2020) investigated approaches to improve students' emotional intelligence and empathy abilities across disciplines. Students' perceptions of their professors' indigenous knowledge and cultural competence positively affect their learning results in terms of cognitive, social, and interpersonal relationship abilities (Suarta et al., 2022). However, inadequate information was known about the relationship between emotional intelligence (EI), engagement, and building interpersonal relationships to foster crucial learning outcomes in higher education (Zhoc Karen et al., 2020).

A recent study employing structural equation modeling found that the emotional climate of the classroom and the relationships between teachers and students positively influences students' attitudes toward STEM (Hill et al., 2021). However, the research also showed that teacher-student relationships that are understanding or authoritative may negatively impact students' persistence in the STEM cohort despite positively affecting the emotional climate of the classroom. The research findings across the disciplines raise essential questions about how instructors can effectively manage their classrooms to increase participation in their respective subjects while integrating technology skills into project completion (Hill et al., 2021; Suarta et al., 2022; Zhoc Karen et al., 2020).

Enhancing Technology Skills

Virtual communication platforms were growing in popularity due to technology's positive influence on fostering interpersonal relationships and developing soft skills among students (Matee et al., 2023). By implementing technology for virtual collaborative learning, educational platforms could be practical and user-friendly applications for building interpersonal relationships (Asif et al., 2021). However, previous research by Matee et al. (2023) revealed that a lack of resources hinders student participation in virtual collaborative learning, clear instructions from the teaching staff, collaboration, internet access challenges, and data costs (Asif et al., 2021; Matee et al., 2023). Furthermore, researcher Matee et al. (2023) suggested several tactics, such as motivating students to collaborate, rating students' engagement on virtual platforms, and consultations, which may be used to overcome obstacles while adopting virtual communication platforms (Asif et al., 2021; Matee et al., 2023).

Customizing Learning and Connectivism Experiences

By using technology to customize and differentiate the learning experience educators may have developed an effective technique for developing interpersonal connections and skills while enhancing student engagement. The following suggestions and advice were derived from the work of Avsec (2023) and Kraiger et al. (2022). Using customized learning strategies based on the premise that students learn best when they have control over their educational experiences, digital platforms promoted student engagement (Avsec, 2023). With technology, educators may have been able to tailor the learning experience to individual students' needs and interests. Furthermore, educators employed adaptive learning systems that provided students with individualized material and activities depending on their learning requirements and preferences has increased student engagement and interpersonal relationships (Avsec, 2023; Kraiger et al., 2022).

With the increasing prevalence of technology in education, there was an opportunity to effectively leverage educational technology tools and software to enhance student engagement and academic achievement to increase retention (Donham et al., 2022; Hagenauer et al., 2023; Haverila et al., 2020). By incorporating technology such as video conferencing, online collaboration platforms, and social media, educators could foster student engagement through network connections, communication, cooperation, and empathy among their students (Donham et al., 2022; Hagenauer et al., 2023; Haverila et al., 2020; Kuh, 2003; Palioura & Dimoulas, 2022). Additionally, leveraging technology to customize and differentiate the learning experiences, digital platforms may have revealed an effective technique for building network connections and developing technical skills while enhancing student engagement (Hagenauer et al., 2023; Haverila et al., 2020; Palioura & Dimoulas, 2022).

In recent years, technology has been crucial in promoting student engagement interactions and emotional intelligence (Haverila et al., 2020). Several technology systems, including virtual reality and social media, have been studied to facilitate emotional intelligence and network interactions (Birkbeck et al., 2020; Donham et al., 2022; Haverila et al., 2020; Kuh, 2003; Palioura & Dimoulas, 2022). Technology has also allowed educators to customize the learning experience based on each student's needs and interests (Hagenauer et al., 2023; Haverila et al., 2020; Palioura & Dimoulas, 2022). Adaptive learning systems have further enhanced student engagement and network connections by providing personalized material and activities that match their learning requirements and preferences (Birkbeck et al., 2020; Donham et al., 2022; Haverila et al., 2020; Palioura & Dimoulas, 2022; Kuh, 2003). Educators could expect even more innovative ways to leverage technology to promote student engagement and connectivism networks as technology evolves and further research is explored.

Connectivism and Communication

The literature synthesized various perspectives on establishing meaningful communication channels, strategies for interaction, engagement in learning, and the multifaceted nature of teacher-student relationships within the evolving educational landscape. Asif et al. (2021) and Birkbeck et al. (2020) emphasized the criticality of effective communication in relationship development. However, with the evolution of the educational environment, Carr et al. (2021) highlighted the need for educators to adopt unconventional communication modes. This adjustment included safe texting and virtual conferencing, as Carr et al. (2021) suggested, which could enhance a student's college experience by providing innovative avenues for interaction.

In understanding engagement, shared elements across diverse definitions included cognitive engagement, active participation, and mastery of subject-related knowledge and skills (Avsec, 2023; Carr et al., 2021; Hafiz Muhammad et al., 2022). The study by Hagenauer et al. (2023) added depth by emphasizing the significance of professional and personal aspects in teacher-student relationships. Positive interactions encompassed official duties and nurturing interpersonal relationships, with indicators like approachability, empathy, support, and trust assessing the quality of the interaction (Birkbeck et al., 2020; Hagenauer et al., 2023).

Hu et al. (2021) highlighted the importance of fostering intrinsic motivation, employing innovative instructional materials, and promoting self-regulated learning as integral to student engagement and achievement. The research highlighted the positive correlation between perceived teacher innovation (PTI) and self-regulated learning (SRL), emphasizing the heightened motivation, self-efficacy, and learning transfer resulting from stronger PTI-SRL connections. This concept enhanced students' responsiveness to course materials, supported effective self-regulation, and enabled them to achieve educational objectives more effectively. These studies highlighted the evolving nature of educational relationships, the role of innovation, and the multifaceted elements that contribute to meaningful and engaged learning experiences (Hagenauer et al., 2023; Hu et al., 2021).

Connectivism and Behavioral Engagement

The assimilation of scholarly literature emphasized the conception of student engagement as a comprehensive framework comprising cognitive, behavioral, and emotional constituents (Parker & Hodgson, 2020; Zhoc Karen et al., 2020). Hafiz Muhammad et al. (2022) and Parker and Hodgson (2020) illuminated that cognitive engagement embodies a realm where individuals engaged in deliberate contemplation and diligent exertion to understand intricate concepts and

master complex skills. This concept went beyond surface-level learning, as emphasized by Asif et al. (2021) and Parker and Hodgson (2020), highlighted the achievement of profound conceptual comprehension. Moreover, the commitment of cognitive effort by students to overcome academic challenges led to psychological struggles with their pursuits, a notion echoed by Avsec (2023), Donham et al. (2022), and Zhoc Karen et al. (2020).

Behavioral engagement, expounded upon by Asif et al. (2021), embodied an active and immersive involvement spanning academic, social, and extracurricular spheres. This multifaceted assessment encompassed favorable conduct, such as adhering to rules, aligning with norms, displaying tenacity, pursuing knowledge proactively, exhibiting resilience in the face of challenges, and engaging in class activities wholeheartedly (Asif et al., 2021). This devoted behavioral commitment serves as a tangible manifestation of students' dedication to holistic development and learning. The emotional facet of student engagement inquired into their affective reactions to classroom dynamics and interactions with peers. Anchored in effective behavior management, this dimension sought to mitigate counterproductive tendencies like procrastination and absenteeism, as emphasized by Donham et al. (2022) and Zhoc Karen et al. (2020).

The lens of expectations emerged as a pivotal tool for unraveling emotional engagement. Anticipated outcomes, perceived effort, and the perceived utility of tasks collectively motivated students' active participation in academic pursuits, as attested by Matee et al. (2023) and Suarta et al. (2022). Thus, the combination of behavioral and emotional engagement depicted an in-depth portrayal of students' intense commitment to their educational journey. Furthermore, emotional engagement encompassed a profound connection to the institution and nurtured feelings of pride, belonging, and admiration for the institution's accomplishments, as highlighted

by Carr et al. (2021) and Zhoc Karen et al. (2020). Research consistently emphasizes that students' emotional investment in their educational journey cultivates a sense of loyalty to the institution, thereby increasing the likelihood of actively pursuing learning goals and achieving degrees, as supported by Carr et al. (2021) and Donham et al. (2022). The body of research converged to unveil the comprehensive nature of student involvement. The cognitive, behavioral, and emotional dimensions collectively influenced effective learning and engagement, providing a comprehensive understanding of how students' thoughtful contemplation, active participation, and deep emotional connection contributed to their educational journey (Asif et al., 2021; Carr et al., 2021; Donham et al., 2022; Zhoc Karen et al., 2020).

Summary

The integration of technology in higher education was recognized for its capacity to enhance student engagement through immersive and personalized learning experiences. However, this progress had simultaneously highlighted challenges in nurturing connections and developing skills due to increased reliance on technology. Siemens's (2004) connectivism theory emphasized that the fluidity of information has transformed the nature of learning, shifting the focus from individual knowledge acquisition to the ability to effectively navigate and employ extensive, interconnected networks or nodes of information. (Siemens, 2004; Siemens, 2005). The use of connectivism theory as a foundation for the research study had the potential to overcome many challenges and may have effectively enhanced students' engagement and academic outcomes through technology.

The primary objective of this study was to address the gaps in the existing academic literature by examining how educators integrate educational technology and network connections into their instructional methods. The research explored the influences of comprehensive

strategies that combine technical expertise with network connectivity, communication, and diverse learning nodes in higher education teaching and learning environments. By exploring educators' experiences, this research focused on how integrating diverse approaches could aid in implementing creative and engaging pedagogical techniques. This study aimed to provide valuable insights to benefit the wider educational community. The investigation sought to provide empirical insights into the experiences and perspectives of educators and offer practical ideas for creating an educational environment that effectively implements technology and connection to enhance academic success and retention.

The theoretical value of this research study rested in its application of Siemens's (2004) connectivism theory to the realm of technology-mediated interactions, which provided a theoretical framework for analyzing the intricacies and dynamics of educational interactions facilitated by technology. While the research did not directly involve technology integration, the objective was to explore how educators can effectively use technological tools and network connections within the connectivism lens to improve pedagogical practices and boost student academic achievements. This research had a two-pronged relevance. Firstly, it aimed to provide practical ideas for educators to effectively integrate technology into their teaching practices. Therefore, it enhanced student engagement and established meaningful relationships that could lead to possible improvements in academic accomplishment. Secondly, the research aimed to bridge the gap in the current literature by examining the implementation of connectivism theory within educational technology and pedagogical practices.

This research explored the relationship between technology, connectivism, and pedagogical efficacy using connectivism as the theoretical framework. The study's primary objective was to contribute practical insights to the field of education and the existing body of

academic research. By exploring digital tools, multimedia elements, online collaboration platforms, and LMS, the study offered educators tangible approaches that may enhance engagement and retention. The research aspired to provide a holistic framework that combines technological innovations with essential interpersonal competencies. Through implementing this approach, the research may have bridged critical literature gaps and offered practical insights for educators in the digital era by helping them navigate the complex terrain of technology while developing meaningful relationships with their students.

CHAPTER THREE: METHODS

Overview

The purpose of this transcendental phenomenological research study was to describe the lived experiences of higher education educators leveraging educational technology to enhance student academic achievement and cultivate networked connections in higher education learning environments at public universities in the southern region of the United States. The chapter presents a comprehensive outline of the methodology used to investigate the experiences of educators who integrated technology to improve academic achievement at a public institution in the southern regions of the United States. The section begins with an overview of the research design, data-gathering methods, and analytical methodologies used in the transcendental phenomenological inquiry. Firstly, the chapter explains how the chosen research strategy aligns with the study's overall goal. Then, it described the methodologies used for data collection, which include conducting individual interviews, organizing focus groups, and using artifacts. The research also included a discussion of the ethical issues that guide the study, followed by a detailed description of the process used for data analysis. This study focused on prevalent themes and contributed to the research objectives by integrating various data sources. The primary objective of this chapter was to provide a thorough understanding of the interconnectedness between research design, data collection, and data analysis in investigating the efforts of higher education educators to enhance student academic achievement through educational technology.

Research Design

A qualitative research methodology was the most suitable approach when examining the experiences of online instructors at public institutions in the southern region of the United States. The qualitative research methodology was particularly relevant when employing educational

technology to enhance student participation and foster academic achievement (Asif et al., 2021; Bolliger & Halupa, 2018). Qualitative research methods gave researchers an advantage by allowing in-depth exploration of participants' life experiences and perspectives (Maxwell, 2012). In the fast-paced and ever-evolving field of higher education, where technology integration was crucial, a qualitative investigation could effectively capture educators' intricate and context-dependent perspectives. The study aimed to provide a contextual understanding of the educators' experiences through the lens of connectivism theory (Siemens, 2004). The transcendental phenomenology approach was chosen for this study because it was highly relevant for examining participants' subjective experiences and obtaining valuable insights into how educational technology enhanced student engagement and academic achievement through connectivism nodes (Moustakas, 1994; Siemens, 2004). By applying the transcendental phenomenology approach, researchers could gain valuable insights while analyzing patterns in human experiences. This method facilitated the development of themes and a philosophical understanding of the subject matter (Moustakas, 1994).

In higher education, educators' roles have been critical in fostering a conducive learning atmosphere (Tuiloma et al., 2022). Qualitative research was an effective method for gaining valuable insights into their pedagogical practices and experiences. This approach allowed the researcher to be immersed in educators' preferences and behaviors while considering their motives, obstacles, achievements, and contextual intricacies (Hill et al., 2021). By capturing educators' perspectives and using participant-focused analysis, researchers could identify unexpected themes and connections that may not be apparent through quantitative tools alone.

Qualitative research was a flexible approach considering the complex relationship between technology, human interaction, and student involvement. It provided the necessary rigor

and depth to thoroughly investigate the personal experiences of educators in their use of technology to enhance student involvement and academic achievement (Vlachopoulos & Makri, 2019). By using this methodology, scholars could understand the complex mechanisms involved in innovative higher education learning environments and make valuable contributions to improving pedagogical teaching practices across all disciplines in higher education learning environments. To fully comprehend the dynamics of leveraging technology in higher education and its influence on student academic achievement, it was essential to examine the study participants' beliefs, emotions, perceptions, and experiences. Moustakas's (1994) transcendental phenomenology approach enabled researchers to set aside their preconceptions and biases and facilitated a comprehensive understanding of educators' experiences. This approach was crucial when investigating complex human interactions and social restraints (Moustakas, 1994).

Transcendental phenomenology was the methodological framework used to investigate individuals' subjective experiences and perceptions in their natural environment (Husserl, 1965). This concept was developed by Edmund Husserl (1965), a German philosopher during the late 19th and early 20th centuries, and has been further elaborated upon by succeeding phenomenologists (Moustakas, 1994). The approach was based on the philosophical tradition of phenomenology, which aimed to provide a comprehensive understanding of events as they are experienced by people without external interpretations or preconceptions (Husserl, 1965; Moustakas, 1994). This study aimed to describe these events' basic structures and key elements, precisely the intentional actions individuals undertake to perceive, understand, and engage with their environment.

Finally, this approach may have encouraged researchers to adopt a receptive and inquiring stance toward the experiences of their participants, which would have led to the

discovery of unexpected insights and perspectives. By demonstrating a keen interest in participants' perspectives and being attentive to their experiences, researchers may have discovered valuable insights and new approaches that could significantly enhance the overall validity of their study. When investigating complex and subjective experiences, it was worth considering transcendental phenomenology's rigorous and systematic approach as a research method to ensure the credibility and authenticity of the study (Moustakas, 1994). It was essential to adhere to ethical norms and consider the limitations inherent in qualitative research (Moustakas, 1994). Through the principles of connectivism and educational technology, the results of this study potentially have provided valuable insights into the field of education while informing pedagogical practices for increasing student engagement and academic achievement.

Research Questions

The purpose of this transcendental phenomenological research study was to explore the experiences of educators leveraging educational technology to enhance student academic achievement and cultivate network connections in higher education learning environments at public universities in the southern region of the United States. The study focused on the lived experiences of educators in the southern region of the United States within public university settings who leveraged educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments. To thoroughly understand this relationship, the study posed a central research question and three subsidiary questions to examine different facets of the educational technology environment and how they aligned with connectivism principles. The study aimed to answer these questions to gain insights into the use of educational technology in higher education and its effect on student academic achievement.

Central Research Question

How do educators at public universities in the southern region of the United States describe their lived experiences with leveraging educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments?

Sub-Question One

How have educational technology tools and connectivism practices been perceived to influence student engagement and academic achievement in higher education learning environments?

Sub-Question Two

How do educators conceptualize and articulate their comprehension of the development of connectivism over time within academic discourse in higher education?

Sub-Question Three

How do educators envision the future of teaching approaches in higher education, considering the influences of technology innovations and the increasing focus on connectivism?

Setting and Participants

The ideal educational environment for this study presented a thorough exploration of the intersection between educational technology, academic achievements, and the principles of connectivism within higher education. An optimal educational environment encompassed interconnectivity, accessibility, adaptability, interactivity, real-time analytics, and a focus on connectivism between educators and students for engagement and academic achievement. This study focused on the potential of educational technology as a fundamental component of a connectivism educational strategy by creating a comprehensive and interactive learning

environment to meet the needs of contemporary higher education students.

The researcher used a qualitative phenomenological approach to analyze the experiences and perspectives of the participants. This research focused on how educational technology could promote academic achievement and student retention at public universities in the southern regions of the United States through the lens of connectivism principles experienced by educators in higher education. The research involved conducting in-depth individual interviews, moderating focus group sessions, and analyzing letter-writing assignments completed by the participants. Additionally, the study focused on educators' technological tools and connectivism principles to enhance student engagement and improve pedagogical practices in higher education learning environments. Furthermore, the research explored the strategies educators used to overcome potential barriers to using technology to improve student engagement and academic achievement and inform pedagogical practices across disciplines in higher education.

Site

Public four-year universities in the southern region of the United States tended to have large and diverse student populations, which provided a broader range of participants for the study. These universities represented a wide range of higher education institutions and offered a comprehensive environment for academic inquiry. It was essential to include diverse individuals in the research study to facilitate a broad range of participants for research endeavors, particularly those focused on studying the influence of educational technologies in various settings. Additionally, many higher education universities in the southern region offered virtual courses and degree programs as potential research locations for the phenomenology study involving faculty members who leveraged educational technology to develop interpersonal connections with students to increase student engagement and academic achievement.

All the universities were distinguished public institutions with a traditional organizational structure typical of universities. The organizational structure of each institution was designed to fulfill the university's goal of providing exceptional education, conducting advanced research, and offering public service. The president of each university held the top position in the executive hierarchy and was responsible for overseeing the overall leadership and management of the institution. The universities consisted of many academic colleges, each of which were overseen by a dean. These deans reported to the provost and vice president of academic affairs. In addition to academic colleges, the universities included other administrative divisions, each overseen by vice presidents who reported directly to the university's president. The research aimed to explore the experiences of educators using educational technology to increase student engagement and improve academic performance through connectivism in educational environments. The study investigated various technological tools implemented by instructors and analyzed the development of connectivism and teaching methods in higher education.

Participants

The research involved diverse participants, from tenured and non-tenured faculty members at public four-year universities in the southern region of the United States. These participants had varying knowledge and experience in educational technology and connectivism theory. To fully understand the participants, the study focused on demographic factors such as age, gender, university role, teaching experience, and technological proficiency. This demographic research aimed to provide insight into each participant’s unique attributes and experiences. The research raised awareness of the influence of individual factors on participant engagement with educational technology and student interactions. This method provided a

comprehensive view of the complex relationship between faculty attributes and the integration of technology and connectivism in higher education environments.

Recruitment Plan

This study explored educational technology and connectivism across academic disciplines. Faculty members with varying levels of proficiency and familiarity were selected from different universities in the southern region. The study encompassed diverse cultural and ethnic backgrounds and various teaching career stages. The aim was to provide valuable insights into the use of educational technology and connectivism theory across institutions from various perspectives. The participant sample included tenured and non-tenured individuals to gather various experiences and opinions. The study focused on recruiting participants from academic departments affiliated with selected public universities. An email (Appendix A) was sent to the departments requesting a compilation of faculty members who meet the study criteria. A formal request was also submitted to Senior Research Compliance Coordinators at various universities across the United States southern region to gain authorization for direct communication with the faculty members. The petition included a letter of intent (Appendix A) that explained the study's goals and ethical considerations.

Individual interviews at public universities within the United States southern region were conducted with the utmost ethical standards to ensure accuracy, trustworthiness, and confidentiality. A criteria screening form (Appendix D) was implemented to identify and validate suitable participants from public four-year universities in the United States southern region who met specific criteria, such as tenured or non-tenured faculty members possessing varying knowledge and experience in using educational technology and knowledge of connectivism theory related to teaching and employing technology to foster student engagement.

Each participant received a recruitment email (Appendix B) with an embedded link to the criteria screening form (Appendix D) designed to gather essential information that confirms the participants' eligibility based on the predefined criteria. The criteria form (Appendix D) included specific questions to determine the participant's employment status (tenured or non-tenured), the institution's location, their experience and proficiency in using educational technology, and their familiarity with connectivism theory. Through meticulous analysis of the responses obtained from the screening form (Appendix D) and diligent verification of each participant's faculty status on the institution's website, I ensured that all participants satisfied the study's criteria. This entailed recruiting both tenured and non-tenured faculty members with diverse knowledge and experience in educational technology, along with an understanding of connectivism theory as it relates to teaching and leveraging technology to enhance student engagement. This was essential to uphold the integrity and relevance of the research. The recruitment method to enlist potential participants consisted of sending the recruitment email (Appendix B) to associated departments and organizations. Lastly, participants received a detailed explanation of the study's goals, methods, risks, and potential benefits before signing an informed consent form (Appendix E).

Once the academic departments provided the list and permissions, a comprehensive email invitation (Appendix B) was sent to the potential participants. The email summarized the study's aims and the nature of involvement. A follow-up email (Appendix C) was sent within 10 days to encourage engagement and answer any inquiries. Individuals who expressed interest in participating will receive a hyperlink redirecting them to an electronic document with a comprehensive consent form (Appendix E). The form outlined the specific processes involved in the study, including precautions to ensure anonymity and ethical considerations. Upon receipt of signed consent forms, participants were scheduled for individual interviews and focus groups

according to the research methodology. The recruitment plan was designed to ensure a representative and diverse sample while maintaining ethical rigor. The standardized communication template in the appendices aimed to maintain clarity throughout the recruitment process.

Researcher's Positionality

As a researcher in the field of higher education, I understood that my personal beliefs and experiences had a significant influence on my work. In particular, my interest in connectivism as a framework for learning was influenced by my philosophical beliefs, career goals, and personal experiences. As a doctoral candidate in Educational Leadership, I have had a variety of educational experiences that have shaped my understanding of the importance of technology in education. I believe that learning is an imperative process influenced by technology, social interactions, and individual experiences. I was also committed to promoting equitable access to education, which is why I was drawn to connectivism's focus on networked learning.

However, I was aware that my personal biases could influence my research. To mitigate this, I was committed to gathering data from various sources and viewpoints and using rigorous procedures to substantiate my findings. My position as a researcher constantly evolved as I learned more about the topic. I acknowledged that my positionality was essential to conducting thorough and impartial research, and I was committed to using it to enrich my academic exploration.

Interpretive Framework

As I pursued my academic inquiry, I preferred an interpretative framework based on conservative social constructivism to emphasize understanding subjective experiences and meanings. Social constructivism aligned with my research interest in comprehending how

educators perceive and understand their encounters with educational technology and connectivism principles. In examining higher education's changing aspects, it was crucial to prioritize the perspectives of those involved in the educational setting. Conservative social constructivism provided a framework for analyzing how significant social constructions influence personal experiences and ideas.

Adaptability and knowledge evolution were crucial in educational leadership, which necessitated adaptability to the evolving terrain of higher education, technological advancements, and social demands. My preference for conservative social constructivism arose from its unity with my research objectives and personal philosophy. The framework offered a solid basis for examining the intricate, collaborative, and dynamic aspects of experiences and interpretations in higher education, specifically within educational technology and student engagement.

Philosophical Assumptions

The philosophical assumptions formed the foundation for my academic pursuits and serve as guiding principles. They were critical in shaping my ontology, epistemology, and axiology views. My research questions were driven by theoretical frameworks, which inspire methodological decisions and influence the interpretative perspective used to evaluate and present research results. These assumptions provided opportunities for critical introspection and enabled me to engage in a continuous discourse between my convictions and the growing scientific data (Lincoln & Guba, 1985; Merriam, 2002).

My academic focus was on Higher Education Educational Leadership, and my philosophical beliefs were rooted in fundamental principles that align with connectivism, interpretivism, and social constructivism. I believe that knowledge is a constantly evolving concept that changes through social interactions and technological advancements. My belief

aligned with the principles of connectivism, which emphasizes that knowledge is dispersed across many networks, including human and computer elements. The influence of context on educational experiences and outcomes is significant and consistent with the interpretive paradigm, which asserts that the perception of reality is influenced by social construction (Creswell & Poth, 2018). As such, it was essential to consider the social and cultural environment in which education occurs to ensure optimal results. I was interested in exploring how educators perceive their roles within the institutional and technical context.

Education was complex and required a flexible approach. Technology, pedagogy, and leadership were all critical factors contributing to successful learning outcomes. My mission was to advance educational equality by championing comprehensive, varied, and fair access to exceptional academic prospects, using research to inform practical applications. It is essential to acknowledge that researchers are not impartial; their own experiences can influence their studies. Recognizing their positionality as crucial enables understanding how their philosophical perspectives can influence study methodology, data analysis, and interpretation.

Ontological Assumption

Ontology was an imperative area of philosophy that focused on exploring the essential nature of existence (Lincoln & Guba, 1985; Merriam, 2002). My ontological assumption was based on the belief that social processes shaped reality and are contingent upon interpretation. I aligned with an interpretive paradigm, where I believed that reality was not an objective and unique truth but a multifaceted interplay of individual experiences, cultural norms, and social interactions. My academic focus on Higher Education Educational Leadership and the connectivism framework heavily influenced this perspective, prioritizing knowledge and learning's intricate aspects.

I used qualitative techniques to capture participants' experiences and viewpoints to determine the authenticity of phenomena. These techniques were designed to go beyond simple observation and actively interact with participants. This approach provided individuals with a more thorough understanding of their constructed realities. The objective was to examine educational phenomena from multiple perspectives, including pedagogy, technology, leadership, and institutional culture, to gain clarity. My primary goal was to conduct research with thorough and rigorous methodologies that prioritize transparency and objectivity. However, I recognized that personal biases could influence the study's outcomes. To mitigate this, I employed methodologies that increase the trustworthiness and validity of the research results. In particular, when dealing with conservative social constructivism, it was essential to implement well-planned and thoughtful methodologies that reduce the influence of personal beliefs (Moustakas, 1994). By doing so, I could maintain a suitable detachment from personal biases and uphold the utmost objectivity and credibility in the research process.

Epistemological Assumption

Epistemology is a branch of philosophy that explores the nature of knowledge and how humans gain it (Lincoln & Guba, 1985; Merriam, 2002). Essentially, it sought to understand the essence of knowledge and the ways in which it was acquired. As a researcher, I collaborated with the participants to develop a shared understanding of their experiences. I acknowledged the significance of personal experiences (phenomenological) and external connections (connectivism) in shaping knowledge, which could offer valuable perspectives on various epistemological approaches and how they may affect research procedures and results from interpretations. Additionally, educators and students may have had opposing perspectives on the role of educational technology in the learning process, with some viewing it as a valuable

instrument for acquiring knowledge and others viewing it as a distraction from more traditional forms of education (Donham et al., 2022). In this qualitative research study, it was essential to include opposing ideas to understand and comprehend diverse experiences and opinions fully. This process required a careful examination that considers contextual factors and acknowledges the subjective nature of truth in social constructivist research rather than seeking to establish a single, objective truth.

Axiological Assumption

This research study highlighted the crucial role of values in the interactions between educators and technology. It acknowledged the ethical implications associated with the principles of phenomenology and connectivism and emphasized the importance of reflexivity in effectively addressing these value-related processes. Addressing these preconceived notions was essential in upholding the ethical soundness of the study and making meaningful contributions to the field of higher education research. As a researcher, I was dedicated to integrating a Biblical worldview into my scholarly endeavors. When examining the use of technology in education, I applied connectivism principles and maintained a neutral and impartial approach.

While Christian ideas influenced my personal convictions, I adopted an impartial stance as a researcher to ensure that the research procedure and the analysis of results remained unbiased and uninfluenced by individual values or ethical considerations. The principles of integrity, truth-seeking, and respect for diverse opinions guided my research approach. I upheld integrity and honesty by adhering to the highest standards throughout the research process, including data collection, analysis, and reporting. This process involved accurately representing data, recognizing limitations, and refraining from modifying information to conform to preexisting beliefs. Following the Biblical worldview that values every individual, I approached

the many perspectives of educators and students with respect and receptiveness. The process entailed providing fair and impartial attention and consideration to all viewpoints without bias or preference.

Although Christian ideals influenced my own perspective, I remained impartial in my study and refrained from allowing personal beliefs to bias the interpretation of data or influence the conclusions derived from the research. Under ethical principles derived from Biblical teachings, I guaranteed that the research was conducted with the highest ethical standards and upheld all participants' rights, privacy, and welfare. In line with the Biblical concept of service, my research endeavors were focused on increasing academic knowledge and benefiting the educational community by providing insights that could strengthen teaching and learning methods.

Researcher's Role

The researcher's role as the human instrument in the study was multi-faceted and central to the success and integrity of the research (Lincoln & Guba, 1985; Merriam, 2002; Patton, 2014). By navigating the research process with transparency, ethical considerations, and reflexivity, the researcher ensured a rigorous and meaningful investigation into educators' experiences leveraging educational technology to foster interpersonal relationships for student engagement. It was essential to have human subjects in this study to ensure the research was thorough, ethical, and accurate (Lincoln & Guba, 1985; Merriam, 2002; Patton, 2014). As the researcher, I remained impartial and objective while following the study procedures carefully to produce reliable and credible results.

During the research process, I meticulously selected the research questions, created the necessary research instruments, and carefully chose participants. The researcher adhered to the

Institutional Review Board (IRB) approval process to obtain the necessary permissions (Creswell & Poth, 2018; Merriam, 2002). Participants were asked to provide information through interviews, focus groups, and letter-writing activities. Data collection followed the study's guidelines (Creswell & Poth, 2018). As the researcher, I remained objective during the analysis of interview data to ensure unbiased results. The researcher accurately presented the findings in writing, avoiding interpretive biases.

The research adhered to the principles set out by Creswell and Poth (2018), which focused on data management and preservation to safeguard the integrity and confidentiality of the research data. All digital information, including recorded interviews, transcriptions, and coded datasets, were securely stored on a password-protected computer, with exclusive access only to the researcher. Physical data, including permission forms and handwritten notes, were stored in a securely locked file drawer inside the researcher's office with limited access.

Therefore, it was essential to note that all data obtained during the research were preserved for three years after the study's conclusion. This timeframe followed standard guidelines set by academic institutions and funding organizations, which allows sufficient time for further investigations, publications, or evaluations. After three years, all digital data will be permanently deleted using secure erasure technologies. Similarly, all physical data will be shredded and disposed of according to the institution's criteria. To maintain participant anonymity and ensure secure data storage, it was determined that data were disposed of after three years. Retaining data threatened participants' privacy and required secure storage for an extended period, which could be a logistical challenge.

Procedures

This study aimed to investigate the experiences of educators from public four-year universities in the southern region of the United States who employed technology to enhance student engagement through the lens of connectivism. Following Institutional Review Board (IRB) approvals from Liberty University and XYZ universities, participants were purposively sampled based on their technological competency and focused on fostering interpersonal relationships to boost student engagement. Multiple data collection methods, including individual interviews, focus groups, and letter writing, were employed to achieve triangulation and ensure a beneficial and comprehensive understanding of the topic. Data were analyzed to identify patterns and trends concerning educators' technological and interpersonal skills in promoting student engagement. The study's findings highlighted actionable recommendations for institutional program development and professional training, with the intent to disseminate these results through academic publications and conferences.

Data Collection Plan

A well-organized data collection plan was crucial in the research process (Yin, 2017). The data collection plan ensured that the data were collected ethically, methodically, and effectively, which resulted in reliable, credible, and comprehensive research findings. The data collection plan guided researchers on the specific methods and strategies to use when gathering data to ensure the data collected was the most relevant to their research inquiries (Lincoln & Guba, 1985). By integrating various data collection methodologies, researchers could thoroughly understand the subject under investigation (Lincoln & Guba, 1985; Merriam, 2002; Patton, 2014).

When examining intricate phenomena, such as educators' experiences leveraging educational technology to foster student engagement in the learning process, using various data collection methods was essential. I gathered data for this research study through individual interviews, focus groups, and letter-writing activities. I began with individual interview questions (Appendix F), followed by focus group session questions (Appendix G), and finally, letter-writing prompts (Appendix H) were provided to the participants by email. The chosen sequence maximized the benefits of each method to gain a complete comprehension of how educators use educational technology to enhance student engagement and academic performance while applying connectivism principles and technological skills to improve student learning processes.

Individual Interviews

The data-collecting process for individual interviews (Appendix F) was conducted in a way that considers and respects the specific requirements and preferences of the participants involved in the research. Based on the participants' preferences and technical capabilities, interviews were conducted virtually using the Microsoft Teams platforms. Each interview was approximately 60 minutes, allowing the opportunity to explore the topic thoroughly. To ensure accurate data collection, I used a high-quality microphone to capture the acoustic characteristics of the interview site (Yin, 2017). An additional video recording device was used as a contingency measure to minimize the potential influence of technological failures (Table 1).

Table 1

Individual Interview Questions

1. Please tell me about yourself. CRQ
2. What inspired you to become an educator? CRQ
3. Please describe your experience as an educator in higher education before your

involvement with educational technology tools. CRQ

4. How would you characterize your initial perceptions of integrating educational technology into your teaching practices? CRQ
5. How would you describe your experiences with leveraging educational technology tools in your teaching practices? CRQ
6. Please elaborate on experiences with specific tools or platforms that you find particularly influential or challenging. SQ1
7. Please explain how the basic principles of connectivism relate to your teaching methods. SQ1
8. How have the concepts of connectivism influenced your approach to leveraging educational technology tools? SQ1
9. Please provide examples of instances in which incorporating technology and applying connectivism principles have significantly influenced student involvement or academic achievements. SQ1
10. What challenges or limitations have you encountered while using these technological tools to enhance student engagement, and how did you address or overcome these challenges or limitations? SQ1
11. Please provide a more in-depth analysis of situations in which educational technology integration and connectivism did not provide the anticipated outcomes. SQ2
12. How do you perceive the relationship between educational technology, connectivism, and student academic achievement? SQ2
13. What obstacles have you faced while endeavoring to integrate technological tools and connectivism ideas in your instructional practices? SQ2

14. How has your perspective on teaching and learning evolved with integrating educational technology and connectivism principles? SQ2
15. Please provide any specific experiences that have shaped your current teaching approach regarding technology and connectivism? SQ2
16. What is your perspective on the future of educational technology and connectivism concerning your teaching methods and the broader context of higher education? SQ3
17. Please share any additional thoughts you may have regarding the research topic or any areas discussed. SQ3

Upon the completion of data collection, the interviews were transcribed verbatim to facilitate a comprehensive and rigorous analysis adhering to the methodological principles outlined by Lincoln and Guba (1985), Merriam (2002), Moustakas (1994), and Patton (2014). The methodology approach provided comprehensive data for investigation and contributed to the depth and credibility of the research. Scheduling interviews began with an introduction email outlining research goals and requesting participation (Appendix B). Identifying academic departments aligned with the research emphasis was paramount, including those encompassing disciplines such as education departments, educational technology, instructional design, and all other relevant subjects. Academic institutions provided easily accessible directories comprising detailed listings of professors and staff members, including their contact information, email addresses, and phone numbers. This data served as a reference point to initiate the initial communication. Department heads, program coordinators, or administrative personnel are the first point of contact. A professional email was the preferred mode of communication to introduce the research project, the purpose of the study, and the potential contributions the department may make, adhere to ethical principles, and obtain IRB approval (Appendix A). The

email emphasized that voluntary participation in the study was crucial in determining the most effective way to approach potential faculty participants. Participants chose a convenient interview time for coordination through the secure digital platform Microsoft Teams.

Focus Groups

Based on the participant's institutional affiliations and technological capabilities, the focus group meetings were conducted virtually using Microsoft Teams. Each focus group session lasted approximately 60 minutes. Before the upcoming focus group session, all participants received a comprehensive email (Appendix B) containing essential information, such as the meeting agenda, questions for discussion, and instructions on installing and using the selected virtual platform. Two distinct audio recording techniques were used to ensure the data's reliability. The integrated recording function of the virtual platform was used in addition to an extra audio recorder as a backup measure. Prior to the start of the session, participants received notification (Appendix E) about the session recording and submitted written and verbal authorization for the recording to take place. The audio recordings were acquired and transcribed verbatim to facilitate analysis. The transcription process was processed using Otter.ai transcription software and followed by the member-checking process review to ensure accuracy.

As the researcher, I facilitated the group session, directed the conversation toward the focus group questions (Appendix G), and allowed authentic discussions to emerge. In online communication, it was vital for the moderator to pay attention to virtual non-verbal cues, such as facial expressions or chat box remarks, and take written notes for reference. This attention was critical in effectively managing turn-taking and fostering active participant engagement. The virtual aspect of the focus group allowed for recording the proceedings for further study, which was essential in examining group dynamics and individual responses. The objective of

employing a rigorous methodology for collecting focus group data was to ensure a comprehensive understanding of educators' experiences using technology to promote student engagement within the theoretical framework of connectivism (Table 2).

Table 2

Focus Group Questions

1. Please discuss effective educational technology tools, their impact on classroom dynamics and student interactions, and any benefits or challenges faced using them. CRQ
2. Please describe specific examples of how you've incorporated connectivism into higher education technology in your teaching experience. CRQ
3. Considering each of your experiences, how do educational technology and connectivism affect student engagement and academic achievement, particularly in terms of shared experiences and evident disparities? SQ1
4. In your collective experiences, what reflections can you share on any patterns or observations related to student retention when implementing technology tools and connectivism principles? SQ1
5. How have your peers or collaborative efforts influenced your approach to leveraging educational technology in the classroom regarding practices or strategies adopted from each other or wish to explore further based on this group's shared insights? SQ2
6. What insight can you share regarding your perspective on the future direction of educational technology and connectivism within the context of higher education for colleague educators or institutions seeking to improve technology integration and connectivism? SQ3

Letter-Writing

As a supplementary method, letter-writing prompts were used to augment the data obtained from individual interviews and focus group discussions conducted with the participants. The letters assisted in including further material that participants may have considered beyond the limitations of the interviews and focus group time constraints. Participants were given one week to complete the task, after which they were required to send two letters each. These letters served the purpose of comparing the assertions made throughout two distinct periods.

After the completion of each individual interview and focus group session with the participants, the educators received an open-ended letter-writing prompt (Appendix H) via email. The inquiry helped address missing information, provide clarification, and validate the data collected in the first interviews and focus group discussions. Both letter-writing prompts consisted of the following question: *How has your approach to integrating educational technology and connectivism concepts into your teaching practices evolved over time, and how would these elements have been helpful to know earlier in your career?*

Data Analysis

Data was collected using various methods, which include individual interviews, focus groups, and letter writing. Data were analyzed independently, and the results of all analyses were combined to provide a comprehensive overview. I implemented a multidimensional approach that combined technology and human resources to ensure the study's individual and focus group interviews were thoroughly and accurately transcribed. This approach aligned with the phenomenological paradigm and involved the Van Kaam technique, modified by Moustakas (1994), which is a meticulous examination of verbal communication and the more subtle components of human expression. The initial stage of the analysis approach involved using

advanced digital transcription software, such as Otter.ai, to convert audio recordings into written documents. This process provided a preliminary transcript of the individual and focus group's verbal components of the interviews for member-checking accuracy verification.

A manual review of each transcript was conducted to accurately incorporate the context-specific subtleties that the digital process may fail to recognize, including nuances of language such as tone, inflections, and pauses. Through the manual process, I ensured the manual notation of non-verbal clues, such as exhalation breaks, hand movements, facial expressions, and other emotions, were incorporated into the transcripts. These aspects were essential in human communication and provided valuable insights into the emotional and psychological states of the individuals involved. To enhance the usability and clarity of the transcripts, I implemented timestamping and speaker identification where multiple voices may be involved during the focus group interviews. Lastly, I dedicated a phase to ensuring the quality of the outcome, which involved reviewing the transcribed content to maintain its integrity and accuracy in reflecting the original speech and expression. Great care was taken in this final step to guarantee that the resulting transcripts accurately and comprehensively represent the participants' experiences and viewpoints.

During the data analysis phase, Moustakas' processes of bracketing, horizontalization, reduction and elimination, clustering, textual and structural description, and explanation of essence were used to identify significant statements, create meanings, and group themes while incorporating the theoretical framework of connectivism (Siemens, 2004; Moustakas, 1994). The coding process and subsequent interpretation of data will be guided by the core elements of connectivism, which included network building, information flow, and the decentralization of knowledge. The research focused on refining technology-mediated learning experiences among

educators using connectivism. The outcomes were documented in adherence to the basic principles of connectivism. The qualitative data analysis and interpretation concentrated on educators' perspectives regarding digital resources, social networks, and the conceptualization of knowledge within the lens of connectivism.

The study compared and contrasted the themes identified from each dataset to highlight similarities and differences. A triangulation method was used to validate the results and ensure accuracy. The study provided a comprehensive view of the complex phenomena under examination by integrating various data collection and analysis methods. The final stage of the analysis involved creating a coherent narrative that aligned with the theoretical framework of connectivism and the critical concepts of the research. This narrative combined the information obtained through various data collection and analysis methods. Ultimately, the study offered valuable insights into the importance of connectivism networks between instructional technology, human interactions, student engagement, and academic achievement in higher education contexts (Lincoln & Guba, 1985; Moustakas, 1994).

I used epoché, phenomenological reduction, imaginative variation, and textural/structural descriptions to collect and analyze data in the data analysis section. During data collection and analysis, it was imperative to maintain a reflexive journal to meticulously document assumptions, opinions, and emotions about the study subject. This practice was crucial to ensure that any biases do not influence the interpretation of the data. It was also paramount to practice active self-reflection by thoroughly examining how experiences and views may influence the understanding of the evidence. Phenomenological reduction was a method of extracting the essential nature of a phenomenon from the accounts provided by participants. This approach necessitated a particular emphasis on the subjective experiences relevant to the study inquiry.

Data analysis was a critical aspect of the research process. Therefore, it was indispensable to meticulously examine the data to identify and extract statements that provide valuable insight into the phenomena under investigation. I organized significant statements into themes that precisely encapsulate the fundamental elements of the participants' experiences, using a process referred to as thematic analysis (Lincoln & Guba, 1985; Merriam, 2002; Moustakas, 1994; Patton, 2014).

Once the data had been anonymized and verified, the next step was to begin the open coding process, using in vivo coding to clarify and highlight themes, which was a crucial qualitative research component. I identified relevant words, sentences, or paragraphs, giving preliminary classifications that encapsulate the substance of the participants' views and experiences characterized by fluidity as new codes continuously emerged and evolved. After coding, categories were established and consolidated, which allowed for the development of emergent themes through fine-tuning. The specialized text analysis software NVivo was used consistently to perform the coding process. The purpose of using this software was to help identify and categorize data based on emerging themes. The software analyzed both evident and hidden information to provide a thorough understanding of the data (Lincoln & Guba, 1985). The coding process of the data were administered multiple times for improvements, including inter-coder reliability testing, which ensured a rigorous analysis.

Following the coding process, the subsequent step involved the analysis of the coded data to identify patterns and themes. In this research, content and theme analysis techniques were used and guided by the theoretical framework of connectivism to uncover patterns, variations, and intricacies in the dataset. This analytical approach combined content and topic analyses to emphasize the insights obtained from individual interviews and provided a comprehensive

understanding of the research questions (Lincoln & Guba, 1985; Moustakas, 1994). The coding procedure yielded reliable and perceptive findings that enhanced the academic discourse surrounding educational technology, interpersonal connections, and student engagement in higher education.

The strategy for analyzing the data collected from the focus group involved using a phenomenological methodology (Moustakas, 1994). The goal was to comprehensively capture the participants' views and interpretations about the phenomena under investigation. I carefully transcribed all spoken content, nonverbal signals, and pauses with significant informational value. Then, I thoroughly examined the transcriptions to extract noteworthy remarks directly relevant to the phenomena under investigation. The remarks were categorized into clusters based on their thematic similarities and differences. Clustering techniques helped to identify emerging themes, such as fundamental aspects of how the events are experienced and understood by the participants (Moustakas, 1994).

The themes were used to construct a narrative synthesis that provided a comprehensive view of the participants' experiences and interpretive frameworks. To ensure the validity and trustworthiness of the results, I implemented participant validation. The participants were invited to review the results and narrative to ensure their experiences and viewpoints were accurately represented. I incorporated their input into the final analysis to support the credibility and reliability of the results. This study encompassed several aspects, including transcription and participant validation, to establish a rigorous and thorough comprehension of the phenomena under investigation. As a result, this research made a valuable contribution to academic discussion in the field of higher education.

Trustworthiness

This qualitative research sought to gain insights into educators' experiences, attitudes, and perspectives on using technology to enhance student engagement within the framework of connectivism theory. The research followed the established criteria of credibility, transferability, dependability, and confirmability, as Lincoln and Guba (1985) summarized, to ensure reliability. The study met the standards of trustworthiness set by Lincoln and Guba (1985) and made valuable contributions to the existing knowledge about the influence of technology on education. This study's primary focus was on student engagement and academic achievement, with distinct attention given to the theoretical framework of connectivism. The research was executed with meticulous design and attention to detail to establish credible outcomes.

Credibility

Conducting a comprehensive qualitative research study required careful consideration of various factors affecting its credibility and acceptance among a wider audience (Bryman, 2016). In this research, I presented an overview of the strategies employed to ensure the feasibility of the study. These strategies included sustained involvement, continuous monitoring, cross-validation, collaborative analysis, examination of counterexamples, thorough referencing, and verification by participants. When conducting a qualitative research study, it was crucial to ensure its feasibility and credibility (Patton, 2014). Credibility could be achieved by implementing prolonged engagement, persistent observation, triangulation, peer debriefing, negative case analysis, referential adequacy, and member checking (Lincoln & Guba, 1985).

Prolonged engagement and persistent observation required building trust with participants and collecting comprehensive data through structured data-collecting sessions and casual gatherings. In addition to conducting research, it was essential for the researcher to

thoroughly document and analyze the elements directly related to the study (Lincoln & Guba, 1985; Moustakas, 1994). A schedule was created to ensure seamless involvement and thorough data analysis. As a commonly used research method in the social sciences, data triangulation involved using various data-gathering techniques such as individual interviews, focus groups, and examination of letter-writing prompts (Yin, 2017). I used this approach to enhance the study's validity by including multiple facets of the research phenomenon, maintaining impartiality, and ensuring a thorough analysis of the research (Moustakas, 1994). One effective method to achieve this was through peer debriefing (Lincoln & Guba, 1985). For this purpose, I sought feedback from external experts specializing in Higher Education. The experts' constructive comments helped to ensure the study's interpretative validity and mitigate potential bias.

Negative case analysis was used to examine the negative aspects or counterarguments of the research topic. This approach helped to provide a comprehensive understanding of the phenomenon. Referential adequacy is the degree to which a language expression precisely identifies the intended reference or concept (Lincoln & Guba, 1985). To confirm referential adequacy, a part of the dataset was reserved and investigated after the study's completion to confirm the emerging conclusions. This secondary analysis verified the facts supporting the interpretations and conclusions. Member checking involved seeking feedback and validation from the participants to ensure the accuracy and credibility of the findings (Shenton, 2004). After the initial analysis, participants were presented with a summary of the findings to verify the correctness and reliability of the results. This approach helped to ensure that the research aligned with the experiences and viewpoints of the participants.

Transferability

Transferability was a crucial consideration in qualitative research, as it pertains to the degree to which the study's outcomes can be applied to other contexts or groups, irrespective of any variations or distinctions from the original research environment (Lincoln & Guba, 1985). Consequently, the research's conclusions offered valuable insights into a range of scenarios beyond the immediate scope of the study (Lincoln & Guba, 1985). While the concept was similar to generalizability in quantitative research, it recognized the complexity of contextual factors inherent in qualitative data (Lincoln & Guba, 1985). However, as the researcher, one could only facilitate the conditions for transferability and could not guarantee its occurrence. The transfer of results from one environment to another was subjected to several components beyond the researcher's control. Consequently, this factor was particularly true in higher education, where various organizational cultures, governance structures, educational programs, and socio-cultural elements may have differed significantly (Lincoln & Guba, 1985; Moustakas, 1994).

To enhance the potential for transferability, I provided a comprehensive and detailed description of the contextual factors, individuals involved, and phenomena under investigation. Readers should be able to understand the research context, which enables them to evaluate the relevance of the results to their circumstances. Techniques such as triangulation, extended involvement, and member verification enhanced the study's credibility and increased the potential for its results to have broader relevance (Lincoln & Guba, 1985). Ultimately, the determination of the generalizability of the study results will rest with the reader. Individuals must evaluate the degree of resemblance between the original and recipient situations to identify the relevance of the results to their circumstances. The process may require a comprehensive understanding of the original study's context and the context in which the reader intends to apply

the results. While it is responsible for providing a solid foundation for prospective transferability by using rigorous methodologies and providing detailed reports, the final determination about transferability lies with the reader.

Dependability

In qualitative research, dependability was a vital concept that ensured the consistency and durability of data across various timeframes, circumstances, and researchers. It was comparable to reliability in quantitative research and guaranteed that results could be replicated and confirmed in future studies (Lincoln & Guba, 1985). At Liberty University, the inquiry audit was used to ensure dependability. The dissertation committee collaborated with the qualitative research methodologist to conduct the audit. The review process involved a comprehensive evaluation of the research design's coherence, the suitability of data collection and analysis methods, and the validity of the results.

To ensure the inquiry audit's effectiveness, I described the study's methodology, including participant selection, data collection and analysis, and interpretation processes. With this information, the audit committee could confidently assess the research's integrity, logic, coherence, and consistency. The dissertation committee and the qualitative research methodologist were instrumental in ensuring the research's credibility and rigor to guarantee reliability. Liberty University maintained dependability in qualitative research by implementing a thorough inquiry audit. The audit, conducted by the dissertation committee, verified the coherence and reproducibility of the research results. The audit's efficacy was enhanced by a comprehensive and transparent account of the research methodologies used to reinforce the investigation's reliability and credibility (Lincoln & Guba, 1985; Shenton, 2004).

Confirmability

Confirmability was an essential aspect of any research study. Researchers could achieve confirmability by emphasizing the degree to which the findings are influenced by facts and participants involved in the research rather than by personal biases, motivations, or preferences. This process ensured that the research was objective and free from personal biases. This approach enhanced qualitative research projects' reliability and comprehensiveness (Lincoln & Guba, 1985). During this process, an auditor analyzed the raw data, data reduction, analysis products, and the findings, interpretations, and recommendations derived from the data. The audit helped to ensure the accuracy and validity of the research, as well as prevent any potential biases or errors from contaminating the results. The thorough assessment ensured that the data supported the results, interpretations, and conclusions without being influenced by the researcher's bias or subjectivity (Lincoln & Guba, 1985).

To maintain a thorough record of all research endeavors, including data collection, coding, and analytical techniques, I implemented a transparent approach to keep an audit trail. The audit trail process involved a structured methodology incorporating memoing and journaling for optimal efficiency while including precise dates to establish a clear timeline for each activity. Audit trails increased the study's confirmability by providing a visible and traceable record of the research methods and preferences (Lincoln & Guba, 1985). I used the triangulation method to ensure the reliability and accuracy of research findings. This process involved using multiple data sources, methodologies, examiners, or ideas to validate the study's conclusions. By comparing and cross-verifying data from different sources, I established the consistency and effectiveness of the conclusions, which increased the study's trustworthiness.

Additionally, I practiced reflexivity, a cornerstone of maintaining the integrity of this research study, to ensure that personal biases do not negatively influence my research, as outlined by Lincoln and Guba (1985). I used a reflective diary to record my experiences, thoughts, and emotions during the study while making note of any biases that emerged. Self-questioning helped me analyze my assumptions, views, and values and identify any cognitive or behavioral tendencies that introduced bias to the study results. By maintaining openness and transparency throughout the project, I ensured the verifiability of the research and enhanced the reliability and credibility of the study result (Lincoln & Guba, 1985).

Ethical Considerations

While conducting the research, it was imperative to abide by ethical principles, commonly referred to as ethical concerns (Lincoln & Guba, 1985; Shenton, 2004). Ethical considerations were paramount in this research and involved educators who use technology to improve interpersonal relationships and student engagement at public universities in the southern region of the United States. To obtain IRB approval, I applied for research approval through Liberty University's IRB process. Data were not collected before receiving IRB approval. I emailed a site permission request to various southern region universities requesting access for direct contact with the prospective participants (Appendix A). I strictly adhered to ethical principles to protect the participants' well-being, rights, and privacy. This study employed site and participant access from southern region universities through the necessary permissions and informed consent (Appendix E). The consent form informed participants of the voluntary nature of their participation and their right to withdraw at any time without consequences. I used pseudonyms, secure data storage, and restricted access to protect confidentiality. Data were stored on a password-locked computer and could be used in future presentations. After three

years, all electronic records will be deleted, and physical notes will be shredded. Recordings are stored on a password-locked computer for three years and then deleted. Only the researcher could access these recordings (Creswell & Poth, 2018). As the researcher, I strictly followed ethical guidelines to safeguard the privacy and rights of participants during and after the study.

Permissions

To obtain authorization for my research study, I followed a rigorous procedure based on the principles outlined by Lincoln and Guba (1985). The process commenced with sending an email to request permission (Appendix A) to various public four-year universities in the southern region of the United States. The email was addressed to the departments responsible for granting site clearance at each institution as identified through their IRB. Upon receiving approval, I submitted an Institutional Review Board (IRB) request to Liberty University seeking approval to conduct my research study. Once Liberty University granted IRB approval (Appendix I), the recruitment email (Appendix B) was emailed to associated departments and organizations at public four-year universities in the southern region of the United States to potential participants. The email briefly described the research goals, methods, participant selection criteria, and ethical considerations and focused on ensuring participant anonymity and safety. A comprehensive description of the research activities was also included, which ensured the research adhered to each institution's academic and ethical norms.

I established communication with the departments responsible for granting site clearance at each institution as identified through their IRB. The IRB forms or conditional approval by Liberty University and required by each academic institution were carefully completed, including all essential details about the study, such as the research proposal, permission forms,

and any additional documents specified by the IRBs. After completing the required IRB forms and study proposal, the documents were formally submitted to the corresponding IRBs of Liberty University and the selected public institutions, according to the submission process required by each institution. I responded to any comments or requests for changes from the IRBs and ensured that the study plan was suitably amended to meet their requirements.

Upon receiving clearance from the IRB, each institution provided an official letter of site approval, which served as the recorded authority to conduct the research at the designated locations. All permission letters and other communication with IRBs (Appendix I) were securely stored on a password-locked computer and documented in the research study. Throughout the study, I maintained the authorized research plan and the ethical principles established by IRBs, which ensured transparency and safeguarding the integrity of the research process. This holistic approach ensured compliance with all institutional and ethical obligations while maintaining the rigor and integrity of the research.

After I obtained permission from the site, interested individuals were contacted by email and asked to complete the criteria screening form provided by a hyperlink embedded within the email (Appendix D). Qualified participants who met the criteria had to be tenured or non-tenured faculty members from a public four-year university in the United States southern region. Participants had to possess varying knowledge and experience in using educational technology and knowledge of connectivism theory. Before participating in the study, all selected participants were required to sign an informed consent form (Appendix E) that explained everything they needed to know about the study, including the study goals and the steps taken to maintain the confidentiality of their information (Lincoln & Guba, 1985).

All essential documents, such as emails, letters of approval, informed consent forms, and criteria screening forms, were carefully documented and attached to the research study. The appendixes served as evidence of ethical and structural compliance that can be verified. Formal emails were used to request site approvals and participant contact permission (Appendix A). By rigorously following these steps, the study met all the site approval requirements and established a morally and methodologically sound research process.

Summary

This chapter provided an in-depth analysis of the methodology used in a research study to describe educators' experiences with leveraging educational technology at public universities in the southern region of the United States. Educators use educational technology to promote student engagement and academic success. The study was based on the transcendental phenomenological framework, which revealed the fundamental aspects and essences that influence human experiences in educational technology and connectivism (Moustakas, 1994). The chapter demonstrated a clear and coherent methodology and presented the intentional design decisions to address the study's research questions. Qualitative research techniques were crucial to this study, involving individual interviews, focus group discussions, and letter-writing to gather data comprehensively. The triangulation technique strengthened the reliability and validity of the research results and promoted a better understanding of the studied phenomena.

The researcher's commitment to suspending preconceived assumptions and conceptions was crucial for maintaining the study's integrity, which allowed the participants' lived experiences to be the focus of the research. This dedication highlighted the study's epistemological foundation and strengthened its legitimacy (Moustakas, 1994). Additionally, the chapter discussed the ethical concerns that govern the research and stressed the need to obtain

informed consent, safeguard participant anonymity, and establish stringent data protection protocols. The ethical principles not only served as a standard for the proper execution of research but also enhanced the study's credibility. This chapter highlighted the strategic coherence among the research inquiries, design decisions, and methodologies for gathering and analyzing data. The methodological coherence of this research established a solid foundation for investigating the experiences of educators as they navigated educational technology.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this transcendental phenomenological research study was to describe the experiences of higher education faculty members leveraging educational technology to enhance student engagement. Additionally, the study focuses on network connections for academic achievement in higher education learning environments at public universities in the southern region of the United States. The purpose of this chapter is to present a detailed analysis of the study's results by describing the 10 participants and giving valuable insights into their backgrounds and responsibilities, which are crucial for understanding the context of the data. The chapter presents the essential data collected through demographic surveys, individual interviews, focus groups, and letter-writing activities. Each subject is explored using illustrative tools like narrative descriptions, tables, and conceptual models. The presentation employs diverse analysis methods, including qualitative methods, to comprehensively view the results. Finally, the chapter concludes by examining how the collected data addresses the research questions presented in the study. This section consolidates the data and analyses their implications for educational technology, aligning the study's findings with its original objectives. The chapter aims to provide a clear and systematic understanding of higher education faculty experiences leveraging educational technology through connectivism for academic achievement in higher education.

Participants

A diverse population of participants was recruited from public four-year universities in the southern region of the United States. Criteria for participation required the faculty member to be tenured or non-tenured with varying knowledge and experience in educational technology and

connectivism theory. Participants volunteered for the research study through an email exchange. Through a combination of purposeful sampling, criterion sampling, and snowball sampling techniques, 25 faculty members responded to the recruitment email. There were 14 faculty members who met the study criteria. A total of 10 faculty members consented to participate in the research study. Of the 10 participants, there were four females and six males. Five participants identified themselves as Caucasian, three identified as African American, and one of each of the remaining two participants identified as Asian and Native Pacific Islander. Two participants were in their late twenties, two were in their late thirties, three were in their early forties, one was in their fifties, and two were in their sixties (see Table 3).

Table 3

Faculty Member Participants

Faculty Participant	Age	Years Teaching	Region of University	Area of Concentration	Educational Technology Experience
Diana	41	10	Texas	Higher Education	Advanced
Daniel	55	3	Texas	Business Management	Advanced/Expert
Joanna	66	15	Tennessee	Allied Health-Medical	Advanced/Expert
John	62	9	Alabama	Advertising and Public Relations	Advanced
Randy	39	13	Florida	Mathematics	Intermediate
Sarah	29	2	Tennessee	Nursing	Novice
Shilo	44	13	North Carolina	Business Management	Advanced
Tina	25	1	Texas	Rhetoric	Intermediate

Tyler	42	2	Texas	Political Science	Intermediate
Walter	38	7.5	Texas	Information Systems and Quantitative Sciences	Novice

Daniel, Diana, Joanna, John, Randy, Sarah, Shilo, Tina, Tyler, and Walter each bring a distinct narrative and profound dedication to the realm of higher education. Daniel integrates technology into hybrid learning environments driven by early educational challenges. Shaped by a severe health crisis, Diana transitioned from aspiring journalist to higher education administrator, deeply committed to student support. Joanna discovered her passion for teaching through her business experience, while John leveraged his advertising background to enrich his courses. Randy's unexpected start to higher education led him to adopt innovative teaching methods. Sarah utilizes technology to enhance nursing education, reflecting the evolving demands of the field. Shilo's cautious approach emphasizes the importance of simplicity in educational technology. Tina, a doctoral candidate, passionately pursues teaching, influenced by her literary studies and the transformative potential of education. Tyler, having shifted from law to academia, is dedicated to teaching political science. Lastly, Walter draws on his family's legacy in education to teach management information systems, embodying the adaptability crucial in business education. Together, these educators exemplify the diverse pathways and impactful contributions that define the landscape of higher education.

Daniel

Daniel, a 55-year-old African American educator, currently serves as a per-course faculty member at a state university in Texas, who leverages educational technology in hybrid learning environments and has firsthand experience as a student in online learning systems. The instructor's journey into education was inspired by personal, educational struggles, motivating a

commitment to assist others facing similar challenges. In his role, he uses technology in a hybrid learning environment that combines in-class and online components through the Canvas information delivery system. Daniel earned his Master of Technology- Data Science degree through a fully online program, participating in collaborative learning. His challenging experience in the K-12 school system inspired him to pursue a career in teaching. Daniel is committed to helping individuals facing similar challenges by providing support and guidance, especially to adult learners or those needing assistance with higher education subjects.

Diana

Diana is a 41-year-old African American female from the southern region of the United States with twenty years of experience in higher education. She was raised by a high school teacher and developed a deep admiration for education, viewing it as a means of personal advancement and a way to serve others. Education is a long-standing tradition in her family. After aspiring to pursue a career in broadcast journalism, she decided to continue her studies in mass communications. However, during her second to third year of college, her path took a drastic turn due to a severe health issue. The disorienting dilemma caused her to reassess her goals, prompting her to change her academic pathway. Motivated by the compassionate and practical support from her college's academic and administrative staff, she shifted her focus to higher education administration. She began her academic career in 2004 as a student affairs specialist, coordinating student support programs. This role provided her with valuable insight into the administrative aspects of higher education. Eventually, she transitioned to teaching in a classroom, fully embracing the role of an educator. More recently, she has returned to an administrative position while teaching part-time. In her professional and personal life, she consistently strives to be a positive influence, taking on the responsibilities of both an

administrator and an educator. Her journey from a health crisis to a successful career in education is defined by her resilience, strong commitment to helping others, and deep determination to enhance her students' academic and personal well-being.

Joanna

Joanna is a 66-year-old African American female educator from Detroit, Michigan. She moved to Tennessee in 1999 and has worked in education since 2000. Joanna has a diverse background, including running a small business in income tax preparation and insurance processing before transitioning to academia as an adjunct professor and an academic coach for the accounting department at a state university. Inspired by family members who were teachers, the educator initially resisted the teaching profession but eventually found a passion for teaching through experiences in business, particularly in training staff on software use. This realization led to a career in education, beginning with a position at a college for medical careers, which transitioned into a full-time teaching role.

John

John is a 62-year-old Caucasian male who works as a senior lecturer at a university in Alabama. He specializes in teaching advertising and public relations. John has spent nine years working in academia after a 25-year career in the advertising sector. Before transitioning to the field of education, he served as the chief strategy officer at an organization in Alabama. With a Master of Business Administration degree, he teaches strategy, research introduction, marketing, and media planning classes. In addition to teaching, he guides students and supervises student groups. His predisposition towards teaching others was evident from his previous experiences of training colleagues in the advertising business and coaching fast-pitch softball as a pastime,

which greatly influenced his decision to shift into the field of education. John perceives teaching and coaching as a method to aid others in finding success in their endeavors.

Randy

Randy is a 39-year-old Pacific Islander and a tenured faculty member in the mathematics department at a state college in Florida since 2011. Randy oversees and instructs various courses, including college algebra, statistics, calculus, and differential equations. His journey into higher education began unintentionally while working as a math tutor at the college in 2003-2004, which sparked his interest in teaching and guiding students to learn from their mistakes and preparing them for exams. His involvement in professional development significantly transformed his teaching methods. He explored active learning strategies and gamification, implementing tools like Blue Kit for competitive recall activities and enhancing engagement. His initial hesitation with technology stemmed from the comfort of his established routine, but seeing practical examples during training sessions helped him embrace educational technology tools.

Sarah

Sarah, a 29-year-old Caucasian female clinical instructor faculty member at a university in Tennessee with a background in nursing, reflects on her journey as an educator influenced by both positive and negative experiences with faculty during her studies. Initially focused on clinical and lab instruction without much technology, her approach has shifted to incorporate more didactic and technology-based teaching methods. She discusses the learning curve and challenges of adopting new technologies, like managing software licenses and integrating digital platforms into her teaching, both in the classroom and clinical settings. Sarah was inspired to pursue a career in nursing education by her experiences with faculty members during nursing school. Her aspiration is to positively influence future nurses by providing the kind of helpful

and constructive education she appreciates. Sarah wants to be a faculty member who offers positive reinforcement and guidance, embodying the teaching qualities she admired in her own instructors.

Shilo

Shilo is a tenured 44-year-old Asian male faculty member at a state university in North Carolina. He specializes in organizational studies and human resource management in the field of business administration. Shilo earned his PhD in 2010 and has taught at the university level ever since. He has held four academic positions, including his current role at the state university. Before his current role, he worked at three different universities in Texas and North Carolina. Initially, Shilo did not aspire to be an educator but found motivation in the impact and influence he could have on others through teaching, research, and advising. His early teaching experiences were limited to using Blackboard, with occasional exposure to other learning management systems provided by textbook publishers. Traditional methods influence his teaching philosophy, and he is cautious about using educational technology. He emphasizes simplicity and user-friendliness in technology to better connect with students who may not have the patience to navigate complex systems.

Tina

Tina is a 25-year-old Caucasian female pursuing her Ph.D. at a university located in Texas. She is also a teaching associate, focusing on instructing students in rhetoric and managing tasks related to course development. Her primary study area is literature, specifically emphasizing Holocaust studies. Tina has an impressive educational background, starting from her birthplace in Florida and achieving educational milestones such as an associate degree from a community college, a bachelor’s degree in English and Creative Writing from a university in

Central Florida, and a master's degree in English from a university in Alabama. Tina's aspiration to become an educator started during her undergraduate studies when she began helping her classmates with different courses, eventually becoming a peer adviser for graduate school applicants. Her involvement in special programs further reinforced her enthusiasm for education. Despite the restrictions of a fellowship in Alabama, limiting her teaching options, she decided to engage in online tutoring jobs for several students. The tutoring experience deepened her passion for teaching and positively influenced students' lives. Tina finds great satisfaction in her role as a university educator, displaying evident enthusiasm for the transformative potential of education.

Tyler

Tyler is a 42-year-old Caucasian male political science professor at a university located in Texas. He specializes in international relations and teaches courses at both the undergraduate and graduate levels. Tyler's teaching experience includes both in-person sessions and online instruction during the COVID-19 pandemic. Before his position at the university, he taught at a private university in Tennessee for one year and in Italy for several years. Initially considering a career in law, Tyler's focus shifted to academics after getting involved in research during college. This change was solidified when he began teaching his courses and discovered his passion for education and how well it aligned with his skills and interests.

Walter

Walter is a 38-year-old Caucasian male professor at a university located in Central Texas, specifically in the School of Business. He teaches various management information systems courses, including database administration, introduction to IT, business scripting languages, and data analytics. He considers himself an adaptable faculty member responsible for addressing various subjects. Walter's motivation to pursue a career in teaching derives from his family

background. His mother dedicated more than three decades to the field of special education and speech therapy, influencing his decision to pursue a career in education. After teaching at the high school and middle school levels, he transitioned to higher education, continuing his family's tradition of teaching and significantly influencing the field of education.

Results

Through examining the educators' experiences at public universities in the southern region of the United States, results and themes emerged from educators using educational technology to enhance student engagement and academic achievement. The themes were closely interconnected with the concepts of connectivism. The results emphasize the intricacies of integrating technology into higher education and anticipate the evolving dynamics of teaching and learning. The data results and themes were derived from a comprehensive analysis of demographic information obtained during individual interviews, an initial letter-writing activity, three focus group discussions, and a post-reflection letter-writing activity.

Individual interviews were conducted via Microsoft Teams with all the participants. The first individual interview was conducted on February 15, 2024, and the last was completed on April 02, 2024. Each participant was emailed the first letter-writing activity (Appendix H) to complete before their scheduled individual interview. During the individual interview, each participant was asked to share their first letter-writing activity response and email a copy to me upon the completion of the interview. Three separate Focus Group sessions were conducted with all 10 participants. One focus group session had four participants, and two sessions had three participants. The first focus group session was held on February 18, 2024, with four participants. The second focus group session was held on February 20, 2024, with three participants. The third focus group session was held on April 10, 2024, with three participants.

The participants eligible for this study were required to be at least 18 years of age and hold a faculty position at a four-year university in the southern regions of the United States. Participants willingly provided demographic information during the individual interviews, all conducted using Microsoft Teams software. Each participant was asked seventeen questions (Appendix F), with follow-up questions asked for clarification when necessary. Before the scheduled individual interview, all 10 participants were emailed an initial letter-writing activity (Appendix H), which they completed and returned by email at the end of the interview. After completing the individual interview, each participant was informed about the focus session and received a Microsoft Teams invitation to schedule one of the three focused group sessions. All 10 participants scheduled and attended one of the three focus group sessions conducted virtually using Microsoft Teams. Participants were asked six questions during the focus group sessions (Appendix G). The individual interviews and focus group discussions were recorded using audio and video and transcribed by Microsoft Teams software. As a form of member checking, all participants were given the opportunity to review the transcripts of both the individual interviews and focus group sessions and provide corrections.

Using NVivo software was essential in the academic analysis of how educational technology is integrated from a connectivism perspective. The Qualitative Data Analysis Software (QDAS) facilitated the systematic organization and analysis of various data types, including individual interview transcripts, focus group transcripts, and two-letter writing contributions. The study methodology adhered to Moustakas' (1994) methodological procedures by applying NVivo's features to identify themes and organize data. The concept of bracketing was employed at all times to eliminate personal biases. The NVivo QDAS program facilitated the efficient retrieval of relevant themes and the removal of unnecessary data, thereby enhancing

methodological precision and the credibility of the thematic constructs. In my analytical approach, the use of NVivo allowed for a comprehensive and impartial synthesis of how educational technology fosters student engagement and academic achievement in connectivism contexts within higher education. By aligning the findings with the central research question and three sub-questions, I was able to identify five key themes through data triangulation using the reduction process (Moustakas, 1994). The emerging themes and subthemes were identified: (1) integration of educational technology, (a) technology pedagogical approaches, (b) technology tools management, (2) perceptions of connectivism, (a) conceptional understanding and application, (b) future prospects and learning sustainability, (3) influence on student engagement and achievement: (a) student engagement methods, (b) academic achievement, feedback, and adaption, (4) educational challenges and solutions, (a) adapting to technological changes, (b) solutions and innovations, (5) future directions in higher education, (a) evolving teaching models, (b) technology's role in future higher education (see Table 4).

Table 4

Themes & Subthemes

Themes	Theme Description	Subthemes	Associated Codes
Integration of Educational Technology	Illustrates the progression from initial skepticism to proactive educational technology integration, emphasizing adaptations in instructional methods to enhance student engagement.	(a) Technology pedagogical approaches, (b) Technology tools management	Integrating Technology Tools, System reliability, User-Friendly Technology, Technology Adoption, Embracing Technology, Innovation Acceptance, Shift to Digital, Change Management
Perceptions of Connectivism	Explores how educators understand and adapt to the evolving concepts of connectivism, influencing their	(a) conceptional understanding and application, (b) future prospects and learning sustainability	Digital Identity Integration, Practical Connectivism, Networked Learning Connectivism, Digital Connectivity, Collaborative

	instructional approaches.		Networks, Learning Ecosystems, Theoretical Application
Influence on Engagement and Achievement	Describes the influence of educational technology and connectivism on student engagement and academic performance, as observed through the utilization of diverse digital platforms.	(a) student engagement methods, (b) academic achievement, feedback, and adaption	Technology Proficiency, Active Learning, Teaching Adaptability Student Engagement, Academic Achievement, Educational Influence, Performance Improvement
Educational Challenges and Solutions	Describes the challenges of integrating technology and connectivism in education and educators' adaptive approaches to enhance learning environments.	(a) adapting to technological changes, (b) solutions and innovations	Technology Proficiency, Teaching Adaptability, Active Learning, Technological Challenges, Adaptation Strategies, Overcoming Barriers, Resilience in Teaching, Solutions Development
Future Directions in Higher Education	Discusses the influence of continuous technological advancements and the increasing use of connectivism on future teaching methods in educational environments.	(a) evolving teaching models, (b) technology's role in future higher education	Active Learning, Blended Learning Models, Hybrid Teaching, Technological Integration, Digital Transformation, Future-focused Education, Future of Education, Technological Advancements, Pedagogical Innovation, Anticipating Changes, Educational Forecasting

Integration of Educational Technology

In the changing landscape of higher education, the incorporation of educational technology is a crucial focus, extensively explored in different academic environments. Codes such as integrating technology tools, systems' reliability, user-friendly technology, technology

adoption, embracing technology, innovation acceptance, shift to digital, and change management were recurrent, highlighting educators' substantial efforts in effectively managing technology to fulfill its intended instructional purpose. The codes were frequently identified, appearing 325 times across the data. These codes were clustered to form the sub-themes of “Technology Pedagogical Approaches” and Technology Tools Management." These sub-themes emphasize the significant efforts by educators to skillfully handle the logistical aspects of technology integration within teaching frameworks. Recurrent references to these codes suggest that educators are not merely using educational technologies as supplementary aids but as essential components of their instructional strategies. Collectively, the narratives and themes offer a comprehensive description of how educational technologies are not merely supplementary tools but integral components of modern educational practices. The participants' experiences highlight the challenge of adopting new teaching methods while effectively managing the logistical aspects of technology. Educators must skillfully navigate this delicate balance, employing their expertise, creativity, and unwavering dedication to ensure the success of their students..

Technology Pedagogical Approaches

Upon further examination of the theme, the concept of Technology Pedagogical Approaches illustrates how educators adjust their teaching methods to incorporate technological advancements. John exemplifies this by describing his proactive approach: "One of my fundamental strategies for integrating technology is what I call the amplification of student inquiries. When I come across a question during office hours or via email that seems to be of common interest, I promptly create a video to address the issue and upload it on Blackboard.” John believes this structured approach enhances the learning experience and demonstrates the adaptable nature of instructional methods to integrate digital solutions effectively. John pointed

out the benefits of using technology in teaching, saying, "It allows me to fill in some gaps in understanding because sometimes students are either shy or can't make it to office hours, but they would have the same question. That way, I can address it once and for everyone." In addition, he mentioned using online polls and quizzes during lectures to keep the students engaged and to promptly identify areas of misunderstanding."

Additionally, Daniel explained, "We've shifted to Canvas to better organize the course content and facilitate easier access for students, which aligns with my goal to keep technology at the forefront of my teaching approach. We started using Kahoot to play games and encourage practical thinking, but students ended up dissecting their cases. It helps them understand the concept in a fun and engaging way. "Diana shared, "Integrating Slack and Microsoft Teams has changed how I manage group projects and maintain constant communication with my students." Joanna stated, "I had to rethink my traditional lectures and transition to more interactive webinars, which required learning how to effectively engage students virtually." Randy emphasized, "Adopting virtual labs was necessary; it allowed students to perform experiments in a safe, controlled virtual environment from their homes." Sarah noted in her letter-writing activity, "The transition to online simulations and interactive patient scenarios was crucial in maintaining clinical skill development during remote learning phases." These discussions focused on integrating technology into teaching strategies, emphasizing pedagogical effectiveness, active learning, and practical connectivism. The results strongly emphasize innovative teaching methods aligned with current educational needs in higher education.

Technology Tool Management

The second sub-theme, Technology Tools Management, explores the practical aspects of managing instructional technology. The sub-theme encompasses the challenges of selecting,

implementing, and maintaining digital technologies. Randy's experience serves as a compelling example. He has honed his ability to integrate educational technologies by continually refining his methods based on student feedback and the practicalities of implementation in the classroom. Randy believes his method illustrates the ongoing technology integration process and stresses the importance of adaptability and openness to feedback. As recorded in the transcripts, educators actively implement digital tools into their instructional practices to enhance teaching efficacy and student engagement. Diana, for instance, shares her thoughtful approach, "My teaching strategy involves presenting educational technology tools to students with varying comfort levels with technology rather than making their use mandatory. This approach allows students to familiarize themselves and decide whether to incorporate these tools into their learning process, making introducing new technology less daunting." This perspective accentuates a complex, inclusive approach to technology adoption, catering to a diverse student population. The prevalence of this theme in all discussions highlights the widespread acknowledgment of the importance of technical proficiency in educational settings. Each participant discussed how they leveraged educational technology tools, showing a collective commitment to leveraging technology to enhance educational environments.

Perceptions of Connectivism

The theme of Perceptions of Connectivism is prevalent in the educational realm as educators contend with leveraging the transformative potential of connectivism in current learning environments. The theme signifies a profound acknowledgment of connectivism as a fundamental framework connecting the power of networks and technology to enhance educational experiences. The sub-themes are prevalent in the discussions of most participants, with codes such as digital identity integration, practical connectivism, theoretical application,

and networked learning connectivism appearing 225 times across the data. These codes illustrate the depth of the educators' engagement with connectivism and demonstrate its application across diverse educational settings and disciplines. The prevalence of this theme across all the data sources stresses the critical relevance; educators consistently recognize the necessity of embedding connectivism principles into their pedagogical strategies to stay relevant in a rapidly evolving educational environment.

Conceptional Understanding and Application

In the emerging Conceptual Understanding and Application sub-theme, I observed how educators comprehend connectivism and actively integrate its principles into their teaching practices. John articulates connectivism integration by stating, "I believe connectivism principles guide my teaching methods by emphasizing the importance of using technology to facilitate access to information and collaboration tools that prepare students for professional environments." The approach exemplifies a broader trend where educators leverage digital tools to enhance connectivity, foster collaborative learning, and embrace the connectivism paradigm. Diana's letter-writing reflection discusses the concept of connectivism in her teaching, emphasizing the importance of "integrating various digital identities and using technology to foster comprehensive educational experiences to prepare students for a globalized world." Diana's statement highlights the theoretical embrace of connectivism and illustrates the practical application in creating rich, interconnected learning environments.

Future Prospects and Learning Sustainability

Moving to the sub-theme of Future Prospects and Learning Sustainability, educators anticipate the development of connectivism and its sustainability in future learning environments.

Joanna offers a cautious yet forward-thinking perspective, expressing concern about the growing dependence on technology, including artificial intelligence (AI). She states, "I am worried about the potential for AI to facilitate academic dishonesty among students. There is a need for more effective systems to verify the authenticity of students' work in order to preserve academic integrity." Additionally, she highlights the role of technology in connectivism, stating, "Connectivism emphasizes the significance of networking and using technology to access information and facilitate learning." Joanna's reflective letter addresses some challenges and opportunities associated with connectivism and emerging educational technologies.

Other discussions among the participants evolved as Randy discussed the impact of connectivism on his teaching approach. He voices, "The principles of connectivism emphasizing networked learning and collaboration reaffirm my evolved teaching style." Likewise, Sarah connected her use of digital tools with connectivism by explaining, "These tools I use align well with the principles of connectivism, revealing the importance of networked learning and integration of digital resources into my classroom." In addition, Shilo shared his thoughts on future technologies and connectivism by admitting, "I fantasize about using advanced technologies like virtual reality in teaching, which aligns with connectivism principles but requires significant adjustments." Tina focused on the communicative aspects of connectivism and explained, "I approach connectivism through daily communications, ensuring students are reminded of due dates and fostering an interactive online community." Like Tina, Tyler expressed his anticipation for integrating real-world applications by emphasizing, "Connectivism has the potential to enrich teaching and learning by integrating educational experiences across various domains of students' lives." Finally, Walter discussed the evolving nature of connectivism by stating, "Reflecting on the theory of connectivism, I recognize the value of

networked learning and the integration of diverse information sources and experiences in educational settings."

Though appearing 197 times across the data, the codes were less frequent than the discussions on the application; the codes related to future prospects and learning sustainability were digital connectivity, collaborative networks, learning ecosystems, and learning sustainability, indicating significant, intentional consideration among educators. The participants currently implement connectivism strategies while envisioning how these approaches will adapt to future educational demands and technologies. The discussion surrounding Perceptions of Connectivism involves active engagement and thoughtful anticipation. Educators are not passive recipients of connectivism ideas but are active agents in shaping how connectivism theory transforms teaching and learning. As the participants navigate these changes, their reflections and strategies provide valuable insights into the evolving nature of education in the digital era.

Influence on Student Engagement and Achievement

The theme Influence on Student Engagement and Achievement critically examines the transformative role of educational technology and connectivism principles in the academic and interactive domains of student experiences as perceived by educators. This theme is prevalent and essential in the discussions across all interviews and focus groups through technological and pedagogical innovations, highlighting educators' strategic focus on optimizing student outcomes. The sub-themes appeared extensively throughout the research data, with educators consistently citing various methods to ensure students are not merely passive recipients of information but active participants in their learning journeys. Frequent discussions around codes, like student engagement, educational influence, performance improvement, gamification in learning, academic achievement, and communication enhancement, appeared 350 times across the data,

illustrating the vital and complex approaches educators are adopting. The theme's universal presence in data triangulation illustrates a shared commitment among educators to leverage technology to foster a more engaging and effective learning environment. The educator's commitment is a crucial component of modern educational strategies to enhance students' involvement and success in their academic pursuits.

Student Engagement Methods

The sub-theme of Student Engagement Methods explores the practical techniques and educational technology tools educators use to enhance student participation. The educational methods encompass various strategies, ranging from gamification to the application of collaborative platforms that foster active learning and interaction. Joanna provides a practical perspective by stating, “I appreciate the benefits of educational technology, especially for facilitating communication and project collaboration among students using platforms like Blackboard and Canvas. I use Canvas discussion boards quite a bit to foster continuous dialogue among students, ensuring everyone contributes outside of regular class hours. These platforms have been essential in adapting my teaching methods to meet the needs of students who are not fully comfortable with online environments." Joanna’s experiences highlight how digital tools are crucial in adapting teaching strategies to meet diverse student needs and preferences to enhance engagement.

Daniel captures the essence of this theme vividly as he describes specific tools for engagement capabilities in classroom settings, contrasting with challenges faced while using Blackboard due to its user-unfriendliness. Daniel explained, "I have started using Kahoot in my classes to turn quizzes into a fun competition. It sparks a lot of enthusiasm and participation." The description accentuates a transition from skepticism to embracing technological tools, which

allows more vibrant and interactive teaching methods aligning with connectivism principles, directly linking technology with student engagement. Daniel's reflection indicates a direct connection between innovative teaching methods and their influence on student engagement.

Each participant provided insight into various tools and methods to enhance student participation and engagement by leveraging technology to create more interactive and inclusive learning environments. Diana shared, "To increase interaction, I have incorporated Jamboard during my online sessions, where students can collaborate on ideas in real time. In discussing programs across the disciplines, Randy stated, "I encourage using Padlet as a way for students to post their thoughts and peer comments, which increases engagement significantly." In addition, Sarah expressed, "I have shifted some coursework to interactive modules in Canvas, where students must navigate through scenarios to progress, keeping them actively involved." However, Shilo recommended "Using Google Forms for quick surveys and feedback sessions, which helps me adjust my teaching in real time based on student input."

Academic Achievement, Feedback, and Adaption

The sub-theme Academic Achievement, Feedback, and Adaptation focuses on the outcomes of the engagement strategies and how they translate into academic success. The theme considers the role of technology-enabled feedback mechanisms that assist educators in monitoring and adapting their teaching to enhance student performance. Randy reflects on this process as adapting over time, as he becomes proficient at integrating educational technologies by continuously refining his approach based on student feedback and practicality in the classroom. The principles of connectivism emphasize networked learning and collaboration, which resonate with Randy's evolved teaching style. The participant's textual description points

to the iterative nature of teaching with technology, where reciprocal feedback is critical in enhancing educational delivery and, consequently, student academic achievement.

The sub-theme was also prevalent and marked by a strong focus on the tangible benefits of educational technology in enhancing academic performance. The frequent discussion around codes like technology proficiency, active learning, and teaching adaptability appeared across the data 310 times, indicating an ongoing effort among educators to refine their instructional strategies based on direct feedback from their educational environments. The predominant description formed by the Influence on Student Engagement and Achievement theme and its sub-themes captures a comprehensive depiction of the current educational environment. The data reveals how educators strategically use technology to enhance students' educational experiences and outcomes, preparing them for future challenges.

Educational Challenges and Solutions

The theme Educational Challenges and Solutions explores the current state of academia, where educators confront many obstacles while integrating technology into their teaching practices. The data reveals an environment marked by ongoing challenges yet equally characterized by inventive solutions educators use to navigate and overcome the obstacles. Codes, such as technology proficiency, teaching adaptability, active learning, and technological challenges, frequently appeared across the data collection 320 times, illustrating these adaptations' common and crucial nature. Through continuous professional development and pedagogical refinement, the discussions underlined the commonality of the challenges and the educator’s commitment to addressing the obstacles. The prevalence of this theme across all data sources emphasizes its significance, as most participants actively discuss the obstacles they encounter and the strategies they implement in response. The prevalent focus illustrates a critical

aspect of the modern educational environment and the continuous evolution of teaching practices in response to emerging technological capabilities.

Adapting to Technological Changes

Adapting to technological changes captures the essence of educators' persistent efforts to keep pace with rapid technological advancements. The subtheme reflects a proactive alignment of teaching strategies with the evolving selection of educational technology tools and platforms emerging within the educational environment. The need for adaptability is not just a response to new technologies but a strategic approach to improving educational delivery and student engagement. The prevalence of discussions around adapting to technological changes highlights a universal challenge educators encounter in staying relevant and effective in an abruptly changing environment. Sarah summarized the essence of the educational challenges and solutions in her experiences by stating, "Before I engaged with educational technology, I only experienced traditional, lecture-based learning environments that often lacked interactive or collaborative elements.” Sarah conveyed that her early academic and teaching experiences were defined by restricted access to technology, which shaped her recognition of the potential improvements educational technology could offer to education. Her reflection upon her experiences resonates with a familiar description among educators as a progression from conventional methodologies to more self-motivated, technology-integrated approaches.

Daniel highlighted the necessity of adapting to new technologies. He reveals, "Technology usage, once optional, has become indispensable, supporting a collectivist approach where technology embeds learning within a social context." Diana reflected on the importance of adjusting to technological changes, "I now understand that my evolving reliance on platforms like Blackboard and Moodle has been crucial for managing courses and enhancing student

engagement." Similarly, Joanna expressed the dynamic nature of educational technology: "I started with traditional teaching and limited digital tools but now utilize platforms like Canvas and Moodle to foster a more interactive and engaging learning environment." By integrating technology to enhance student connection, John stated, "Technology as a means to maintain student connection and engagement with the class material requires me to be meticulous in managing course assignments and evaluations." From a teaching perspective, Randy spoke about the continuous innovation required by stating, "I see the potential for these tools to transform traditional lecture-based classes into more dynamic, interactive environments."

Shilo discussed the ongoing adaptation to technological advancements by revealing, "The ongoing challenges of integrating technology, such as the time spent on technical instruction, highlight the need for ongoing adaptation to student needs and advancements." However, Tina emphasized the learning curve with new technologies: "I plan to explore social media-like platforms for enhanced interaction and acknowledge the steep learning curve with new technologies." Additionally, Tyler remarked on the necessity of evolving teaching methods: "The use of technology like Turnitin has streamlined assignment submissions and plagiarism checks, which I find invaluable for maintaining academic integrity." Lastly, Walter spoke about continuously exploring new methods: "My proactive use of various platforms has fostered a more interactive and engaging learning environment, encouraging student participation in knowledge creation."

Solutions and Innovations

Moving beyond adaptation, the Solutions and Innovations sub-theme focuses on the strategies educators develop to overcome the challenges posed by technology integration. The discussions revealed the educator's creativity and resourcefulness in leveraging technology to

solve pedagogical problems and enhance learning outcomes. Educators like Randy demonstrate this innovative spirit, as he shared, "I have explored active learning strategies such as gamification, implementing tools like Blue Kit for competitive recall activities and enhancing engagement." Additionally, Randy described his approach to dealing with digital platform limitations: "I have started using a blend of tools. If one doesn't work well for discussions, I will use another that facilitates better interaction, like switching from Blackboard to Canvas for certain activities."

Daniel explained his approach to overcoming resistance to new technology: "I had to really push the benefits and demonstrate them in class to get buy-in from the students who were skeptical." As a method for addressing technical challenges, Diana shares, "Whenever we face issues with Moodle or Blackboard, I schedule quick training sessions. It's about staying proactive and not letting the tech issues derail our course objectives." As a strategy for enhancing platform reliability, Joanna discusses, "I often run parallel systems during critical exams or submissions to ensure that if one fails, we can immediately switch to the other without losing student work." In addition, John highlighted his solution for maintaining engagement in a digital setting: "To counter the impersonal nature of online learning, I increased the frequency of interactive quizzes and real-time feedback sessions."

Like the other participants, Sarah outlined her strategy for technical discrepancies, voicing her perspective, "I maintain an open line of communication with IT support to quickly address any glitches and ensure the technology does not become a barrier." Likewise, Shilo spoke about his method for consistent technology use: "Regularly updating course materials and training on new platforms is key. I also provide students with alternative resources to ensure learning continues despite tech failures." In contrast, Tina discussed overcoming integration

hurdles: "Adopting a modular approach allows me to isolate tech issues in specific parts of the course without affecting the entire curriculum." Tyler highlighted student engagement and emphasized the importance of student training: "I hold orientation sessions at the start of the course to familiarize students with all the digital tools we'll use. This reduces anxiety and resistance significantly." Focusing on technology integration, Walter shared his perspective on continuous adaptation. He verbalized, " You must be responsive and willing to learn new technologies yourself. If you understand them well, you can better assist students when they encounter issues." During the discussion, educators explored various methods and challenges related to student engagement. They emphasized how technological tools can be leveraged to create more interactive and influential learning experiences, while also highlighting the proactive strategies employed by educators to address the challenges of integrating educational technology into teaching practices, ensuring that learning outcomes remain unaffected by technological obstacles.

The frequent mention of codes related to adaption strategies, overcoming barriers, resilience in teaching, solutions development, gamification in learning, enhanced engagement, and practical technology appeared throughout the data 350 times, reflecting the substantial emphasis placed on finding practical solutions to educational challenges. The codes noted hundreds of times across interviews, focus groups, and letter-writing activities accentuate the importance of innovation in the educational process. The discussions around the Educational Challenges and Solutions theme depict an educational environment where educators continually engage in a cycle of problematic identification and solution implementation. The ongoing process, driven by challenges and creative responses, is critical for advancing educational practices and ensuring they remain aligned with the evolving demands of the digital age.

Future Directions in Higher Education

The theme, Future Directions in Higher Education, captures the participants' anticipations and strategic foresight as they contemplate the evolving environment of academia in higher education. The discussions centered around the shared understanding that higher education must adapt to embrace technological advancements, changing societal needs, and new pedagogical methods. Codes such as active learning, blended learning models, technological integration, hybrid teaching, pedagogical innovation, and educational forecasting frequently appeared across the data 342 times, illustrating the educators' commitment to adapting and improving teaching methods to better align with the needs of current and future students. The frequent mention of these concepts across various discussion platforms highlights the critical and prevalent nature of the adaptive educational approach. The prevalence of this theme across all data sources indicates a strong consensus among educators about the importance of proactive adaptation in higher education. Discussions about future directions were common and integral to most participants' experiences, emphasizing forward-thinking and readiness for forthcoming changes.

Evolving Teaching Models

The sub-theme, Evolving Teaching Models, explores the expected changes in teaching methods that will shape future educational practices. Educators anticipate a move from traditional, lecture-based instruction to more interactive, blended, and hybrid formats by using online platforms to enhance interaction and engagement. This transformation is widely discussed across the dataset and strongly focuses on the need for pedagogical flexibility and innovation. The participants highlight expectations for more personalized, interactive, and technologically enriched educational environments that respond to the evolving needs of students and society.

John's letter-writing reflection provides insight into this theme. He states, “Reflecting on my experiences and the insights gained from recent discussions and focus groups, I recognize several key aspects of my relationship with educational technology it's not just about enhancing teaching within the confines of the classroom but about integrating these tools into students' everyday lives, preparing them for a technologically integrated world." Additionally, John believes, "Teaching methods will increasingly rely on data analytics to tailor educational content to individual student needs. It's about personalization at scale."

Focusing on the discussion of connectivism and technology, Daniel shares, "We're moving towards more collaborative and interactive learning environments. I expect we'll see a significant shift from traditional lecture-based approaches to more technology-driven, student-centered learning." Comparably, Diana stated, "The future is going to be about adaptability. As technology advances, so must our teaching methods. I foresee a blend of synchronous and asynchronous learning becoming the norm." Similarly, Joanna predicted, "I anticipate a future where real-world problem-solving through digital platforms becomes a staple in our teaching methods. It's about preparing students for the world beyond the classroom."

Envisioning teaching in the future, Randy explained, "I see the role of game-based learning expanding in educational settings. It engages students in a way traditional methods can't, making learning fun and effective." In the same anticipation, Sarah highlights, "Future teaching methods will have to be increasingly interdisciplinary, integrating technology to provide a more holistic education that spans multiple fields of study." Shilo believes, "The classroom of the future will be anywhere and everywhere. Mobile learning will dominate, giving students the ability to learn on their own terms and schedules." Additionally, Tina discussed, "We’re looking

at a future where augmented and virtual reality takes center stage, providing immersive learning experiences that were once unimaginable."

In a discussion regarding teaching and technology, Tyler emphasized, "Expect teaching to become more interactive, with technologies like AI playing a pivotal role in automating administrative tasks and enhancing engagement." As a final point, Walter explained, "The future of teaching lies in the cloud. Cloud-based technologies will allow for more collaborative projects and real-time feedback, revolutionizing the way we teach and learn." The testimonial summarizes educators' broader vision for the future, where teaching is profoundly interconnected with technology and responsive to students' holistic needs. The research data reflect a forward-looking perspective shared among the educators, emphasizing the integration of advanced technologies and innovative teaching strategies.

Technology's Role in the Future of Higher Education

Technology's Role in the Future of Higher Education explores how the integration of digital tools is set to transform teaching methods, administrative operations, and student engagement strategies. The sub-theme reflects a strong belief in the transformative power of technology as a supplementary tool and fundamental component of educational distribution. The influence of technology on the future of higher education is a prominent topic of discussion. Most participants emphasized technology as the driving force behind changes and shaping educational experiences. The discussions indicate a widespread recognition that higher education institutions must effectively implement educational technology to remain relevant and responsive in a rapidly evolving educational and technological environment.

Daniel shared, "Technology has revolutionized how we teach and learn. It's no longer just an add-on; it's central to delivering education effectively in this digital age." Additionally, Diana

explained, "I've seen firsthand how tools like Kahoot can transform a quiet classroom into a dynamic learning environment. It's not just supplementary; it's essential." Similarly, Joanna discussed, "Integrating technology isn't just about enhancing learning; it's about redefining it. Tools like Canvas allow us to extend the classroom walls virtually anywhere." Relatedly, John highlights, "Technology allows us to bring the world into the classroom in real-time. It's an essential component, not just for engagement but for providing a global perspective." Furthermore, Randy mentioned, "The shift to digital is not just an enhancement. It's a transformation. Tools like GeoGebra aren't just aids; they are integral to how students interact with complex concepts."

Like other participants, Sarah stressed, "Technology in nursing education is not just supplementary; it's critical. From simulations to real-time data access, it's transforming how we prepare our students for the real world." However, Shilo spoke of educational technology in general by sharing, "I believe in the power of technology to level the playing field in education. It's not just an add-on; it's a fundamental pillar that allows all students access to the best resources." Comparably Tina discusses, "The digital tools we use are not just supplements. They are part of the core delivery of our curriculum, enabling us to reach and engage students in ways traditional methods cannot." Focusing on the social sciences, Tyler emphasized, "Using technology in teaching political science has allowed us to simulate and analyze real-world scenarios like never before. It's a fundamental part of how students absorb and apply their knowledge." On the other hand, Walter explained, "Technology is not supplementary in our field; it's foundational. It enhances every lecture, every assignment, and how our students engage with the material and each other."

The direct discussion among participants highlights a consensus on the essential role of technology in modern education while accentuating its transformative effect on teaching methods and the distribution of educational content. The educators view technology as an enhancement and an indispensable element that reshapes and enriches the educational landscape. The theme of Future Directions in Higher Education depicts an academic sector on the verge of significant transformation. Educators are preparing for changes by actively developing and implementing strategies to ensure that higher education remains strong, relevant, and equipped to fulfill its role in a world integrated with technology. The ongoing discussion of these themes draws attention to the universal significance and urgency of embracing innovative and responsive educational practices for the future.

Outlier Data and Findings

During the examination of technology integration within educational settings, unexpected findings emerged regarding students' attitudes toward innovative technological tools. Despite the common assumption that the digital generation is naturally comfortable with technology, one educator reported a noticeable struggle among students adapting to new software and tools in educational contexts. This resistance contradicts the expectation that younger generations are naturally tech-savvy and adaptable, highlighting a significant difference between the use of everyday social technologies and the demands of academic technology integration. The unanticipated discoveries prompt educators to reassess their approaches to the adoption of educational technology, with a focus on narrowing the gap and enriching student engagement with educational technologies.

Outlier Finding #1

Despite the general assumption that today's students are inherently comfortable with technology due to their upbringing in a technology-driven world, one participant mentioned a surprising resistance among these students when adopting new software and technological tools in educational settings. This observation contradicts the widely held belief that younger generations are familiar with, flexible, and eager to embrace new technologies. Such resistance suggests that familiarity with everyday consumer technology, such as smartphones and social media, does not necessarily translate into an ability or openness toward academic or professional software applications. This unexpected reluctance highlights a gap between general technology usage and the specific demands of technology integration in higher educational environments. Educators may face challenges in finding more effective ways to bridge this gap and enhance student engagement with new technological tools.

Outlier Finding #2

Regardless of the technology trends in higher education institutions that integrate popular platforms, like Microsoft Teams and Google Classroom, one educator was hesitant to fully embrace the technology due to their experiences and preferences for teaching style. This hesitation highlights the need for a personalized approach to educational technology. Instead of following trends or widely accepted technologies, these educators prioritize ensuring that their technology aligns with their teaching techniques and student engagement preferences. This viewpoint emphasizes the importance of considering individual effectiveness and the unique dynamics of each classroom when introducing new technology. It suggests that what may work on a large scale might not be the most suitable option for every educational setting or teaching objective.

Research Question Responses

This section of the research study entails a comprehensive examination of the primary research issue and three specific sub-questions formulated to enrich and delve deeper into the study. Throughout the data collection phase, a thorough analysis was conducted on the narrative responses received for each sub-question. The responses are used to identify and analyze various emerging themes in relation to each question. The approach provides a systematic thematic analysis that contributes to a comprehensive understanding of the overall focus of the study. Verbal quotes from the collected data supported the analysis and provided substantial evidence of the identified themes. These quotes served a dual purpose: first, to illustrate the participants' perspectives, and second, to firmly establish the interpretations of the themes based on the factual data obtained from the research participants.

Central Research Question

How do educators at public universities in the southern region of the United States describe their lived experiences with leveraging educational technology to foster student engagement and improve academic achievement by applying connectivism principles in learning environments? Educators at public universities in the southern region of the United States have embraced the integration of educational technology and connectivism principles to profoundly transform their teaching and enhance student engagement and academic achievement. The participants' narratives illustrate the shift from conventional pedagogical methods to more effective, technology-integrated learning environments that actively leverage connectivism approaches. Diana stated in her letter-writing reflection, “I have required students to use the Blackboard, Moodle, or Canvas platform since I have been teaching. Now, the usage of it has evolved over time, as I rely increasingly on these tools to help communicate with students and to

manage the course. It is also used for student engagement and collaboration." This statement reinforces the idea regarding the shift from conventional pedagogical methods to more effective, technology-integrated learning environments actively leveraging connectivism principles.

The educators' experiences highlight a significant transformation enabled by educational technology tools, which facilitate more engaging and accessible learning experiences. For instance, Daniel describes the essential shift in his teaching approach, mentioning specific tools, like Kahoot, for their engagement capabilities in classroom settings. This contrasts with challenges encountered by using Blackboard due to its user-unfriendliness. Daniel's experiences reflect a broader trend where educators leverage technology to enhance content delivery and foster a more interactive and participatory learning environment.

Connectivism, which emphasizes creating learning networks and integrating diverse digital tools, resonates profoundly with the participants' teaching philosophies. Diana articulates this integration by discussing the concept of connectivism in her teaching, emphasizing the importance of integrating various digital identities and using technology to foster comprehensive educational experiences that prepare students for a globalized world. The approach highlights the commitment to using technology as a bridge to connect students with information and each other, thereby enriching their educational experience and preparing them for the complexities of the modern world.

The direct influence of technological and pedagogical shifts on student engagement and achievement is evident. Educators report significant improvements in student involvement and learning outcomes due to the application of interactive and collaborative tools facilitated by educational technology. Joanna shares her effective use of these tools; the educator appreciates the benefits of educational technology, especially for facilitating communication and project

collaboration among students using platforms like Blackboard and Canvas. The enhancements are crucial for engaging students and deepening their understanding and mastery of the course material.

Despite the enthusiasm for the changes, challenges such as technological resistance and the need for ongoing adaptation and professional development remain. Educators have responded with innovative solutions to overcome these barriers, continuously refining their methods to enhance learning outcomes. John reflects on adapting course designs to maintain engagement and academic integrity; he provides details on creating and adjusting an online consumer research class designed to prepare students for more advanced coursework. His approach to online teaching aims to replicate the openness of live teaching, maintaining academic integrity and adjusting coursework based on student feedback and performance. Through the discussions, it becomes evident that integrating educational technology and connectivism principles is an enhancement of traditional teaching methods and a fundamental reconsideration of how education is delivered and experienced in higher education. Educators at public universities in the southern region of the United States are at the forefront of crafting vigorous, responsive learning environments that prepare students academically and as active participants in a technologically integrated world.

Sub-Question One

How have educational technology tools and connectivism practices been perceived to influence student engagement and academic achievement in higher education learning environments? Educational technology tools and connectivism practices have been transformative in higher education by significantly improving student engagement and academic performance. The educators at public universities in the southern region of the United States

have embraced these tools and methodologies, integrating them seamlessly into their teaching practices. This integration is vital for fostering effective learning environments and preparing students for the complexities of the modern technology-driven world.

Joanna vividly describes the positive influences of these practices by sharing, "The use of educational technology has been a core component of my teaching, particularly evident in courses where I required students to submit video projects without specifying the software, exposing the diverse technological access and skills of students." Joanna finds this approach increases engagement by involving students in the active and practical use of technology while enhancing their learning outcomes by encouraging them to apply their knowledge and critical thinking skills in various ways. The narratives demonstrate educational technology and connectivism's critical role in modern educational settings and highlight their effectiveness in enhancing student engagement and achieving academic success. By leveraging these tools effectively, educators can establish inclusive, interactive, and flexible learning environments that resonate with and address the diverse needs of their students.

Sub-Question Two

How do educators conceptualize and articulate their comprehension of the development of connectivism over time within academic discourse in higher education? In higher education, educators have increasingly embraced the principles of connectivism by viewing them as an essential evolution in teaching and learning methodologies. The shift reflects a deeper understanding of how connectivism as a learning theory influences the role of social and technological networks in the learning process, which has developed and integrated into academic discourse over time. Diana articulates her comprehension of the development as she discusses the concept of connectivism in her teaching, stressing the importance of integrating

various digital identities and using technology to foster comprehensive educational experiences to prepare students for a globalized world. Shilo reflects on an incident where he had to adapt his teaching approach for a visually impaired student by highlighting the need for ADA-compliant course designs. This experience profoundly shaped his approach, increasing his awareness of the diverse needs of students and the necessity for accessible teaching methods. His statement gives prominence to the transformation in educational strategies while highlighting the shift from traditional, isolated learning methods to more interconnected and network-driven approaches. Tina uses EdPuzzle to make lectures interactive and stresses the importance of structured, accessible online platforms for coursework organization and communication. The narratives demonstrate how connectivism has been conceptualized as a theoretical framework and a practical guide that shapes and enhances the educational learning environment. It has become increasingly relevant as educators seek to leverage technology and collaborative networks to enrich the learning experience and prepare students to thrive in a complex, interconnected global community.

Sub-Question Three

How do educators envision the future of teaching approaches in higher education, considering the influences of technology innovations and the increasing focus on connectivism? Educators anticipate a transformative future for teaching approaches in higher education as technological innovation and the principles of connectivism represent fundamental roles. The future involves leveraging educational technology to enhance interaction, communication, and connectivity within the learning process while creating more collaborative and adaptive educational environments. John describes his vision in his teaching practice as he explains how technology can fundamentally alter the educational experience: "One of my key strategies for

incorporating technology is what I refer to as the amplification of student questions. When I receive a question during office hours or via email that seems likely to be of general concern, I create a quick video to address the issue and post it on Blackboard." John believes his strategy reflects a shift towards a more responsive and interconnected teaching approach, where technology is used as a tool for delivering content and as a means to enhance communication and foster a community of learners. Additionally, Walter's letter-writing reflection states, "I have experimented with numerous tools, including Discord, Google Classroom, Microsoft Teams, Canvas, Kahoot, and Cengage, among others. While not all tools have fully met my needs or expectations for every course, this experimentation is crucial for identifying the most effective technologies for enhancing student collaboration and engagement. I have also developed my own applications to automate grading and detect AI use in scripting and database courses." The participant's narrative confirms the growing emphasis on connectivism, where learning is viewed as a networked process that benefits significantly from technological integration. By adapting educational technology tools and philosophies, educators enhance individual learning experiences and redesign the academic landscape to better prepare students for the challenges of a globalized and digital world.

Summary

Educators at public universities in the southern region of the United States have profoundly integrated educational technology and connectivism principles into their teaching, significantly enhancing student engagement and academic achievement. Through the themes of integration of educational technology, perceptions of connectivism, influence on student engagement and achievement, educational challenges and solutions, and future directions in higher education, it is evident that technology is not just a supplementary tool but a fundamental

component of the educational learning environment. Educators value technology's ability to transform teaching methods and enrich learning environments while making them more interactive, accessible, and responsive to student needs. Additionally, adopting connectivism has facilitated a more collaborative and interconnected approach to learning, which prepares students for an increasingly globalized world. The transition toward vigorous, technology-driven educational models is enhancing the learning experience and paving the way for future advancements in higher education teaching and learning.

CHAPTER FIVE: CONCLUSION

Overview

The purpose of this transcendental phenomenological research study was to describe the lived experiences of higher education educators leveraging educational technology to enhance student academic achievement and cultivate networked connections in higher education learning environments at public universities in the southern region of the United States. Of the 10 participants, there were six males and four females. Five participants identified themselves as Caucasian, three as African American, one as Asian, and another as Native Pacific Islander. Two participants were in their late twenties; two were in their late thirties; three were in their early forties; one was in their fifties; and two were in their sixties. Transcendental research was the chosen method for collecting and analyzing data to explore the essence of the human experience and focus on participant experiences. This chapter presents the overview of the discussion subsections: (a) interpretation of findings, (b) implications for policy and practice, (c) theoretical and methodological implications, (d) limitations and delimitations, and (e) recommendations for future research.

Discussion

The purpose of this section was to discuss the findings of the lived experiences of higher education faculty members with leveraging educational technology and connectivism to foster student engagement and academic achievement in higher education at public universities in the southern region of the United States. Guided by Siemens's (2004) connectivism theory, the study analyzes the nature of educators building network connections to effectively leverage educational technology for fostering student engagement and academic achievement encompassing connectivism principles. This study significantly contributes to the general

knowledge base by expanding the empirical research base and existing knowledge on educational technology and connectivism theory in conjunction with transcendental phenomenology (Moustakas, 1994; Siemens, 2004). It deepens our understanding of the intricate relationship between educational technology, student engagement in higher education, and the connectivism learning theory, which has the potential to inform and shape future educational practices.

A transcendental phenomenology model was applied to describe how integrating educational technology has significantly shifted from traditional teaching methods to more connected and technologically advanced learning environments in the evolving redesign of higher education. Educators at public universities in the southern region of the United States have witnessed notable pressures for improvements regarding student access and teaching effectiveness, serving as a compelling concept of educational environment transformation. Educational advancements extend beyond the practical aspects of education and encompass pedagogical approaches to prioritize the accessible and inclusive presentation of complex concepts and easier access to learning resources.

The experiential shift closely aligns with connectivism principles while increasingly gaining traction among educators in their instructional practices. The emphasis on establishing interconnected learning networks signifies a significant stride toward a connectivism educational framework. Educators are leveraging educational technology to enhance traditional teaching methods to provide immersive, interconnected experiences while integrating multiple digital identities. This approach aspires to equip students for a hyper-connected world that fosters global perspectives and transcends local boundaries in knowledge and competencies.

The results of this study provide empirical evidence indicating substantial improvements in student engagement and academic performance stemming from the adoption of educational technological and connectivism innovations. Educators discuss implementing connectivism methodologies with educational technology to foster participation and flourishing learning environments. Students who actively engage in learning processes and exhibit a profound understanding of the course content are positioned to achieve improved academic outcomes and develop rich learning experiences.

Incorporating technology into education brings numerous benefits, but it also presents challenges. Educators and students may resist change, which requires ongoing professional development and adaptability. Educators have shown great initiative in addressing these challenges and improving their teaching strategies. Educators who overcome these obstacles highlight the perseverance and resourcefulness needed to leverage instructional technology fully. Given the growing influence of connectivism and ongoing technological advancements, educators foresee additional changes in higher education. The participants anticipate an intense educational technology integration that blurs the lines between modern digital approaches and traditional pedagogical frameworks.

The future is actively shaped by current practices and innovations while paving the way for an innovative, interconnected, and technologically proficient higher education system. It's not just a theory. The challenges offer valuable insights into higher education's current and future state. Participants highlighted the difficulties encountered and emphasized the advantages of integrating connectivism with educational technology. They envision a future in which education is technologically advanced, interconnected, and capable of catering to a diverse student population. The fundamental changes, combined with the ongoing pursuit of educational

innovation and quality, ensure that the evolving narrative continues to transform higher education learning.

Summary of Thematic Findings

The thematic findings of this study articulate the profound influence of leveraging educational technology and connectivism principles at public universities in the southern region of the United States. This research reveals a critical transformation in pedagogical practices for enhancing student engagement and encouraging academic achievement within the realm of higher education. Through thorough analysis, several key themes have been defined to provide an exhaustive overview of these educational integrations' ramifications on faculty members and students. These themes encapsulate the integration of educational technology, perceptions of connectivism, and its consequent influence on student engagement and achievement, educational challenges and solutions, and future directions in higher education. Collectively, these findings illuminate the pathways through which educational technology and connectivism approaches can reshape the higher education landscapes while fostering enhanced learning environments and outcomes**.**

Leveraging educational technology at public universities in the southern region of the United States, educators have observed significant improvements in teaching effectiveness and student accessibility. The transformation emphasizes transitioning from traditional teaching methods to technology-enhanced learning environments. Implementing technology tools like digital platforms and interactive applications not only simplifies and clarifies complex concepts, but also ensures open access to learning materials for students. This progression indicates a substantial advancement in modernizing educational practices to enhance accessibility and engagement in learning.

Regarding perceptions of connectivism, the results of this study substantiate the principles of connectivism by highlighting the significance of forming interconnected learning network nodes. Educators have leveraged educational technology to create extensive, networked learning experiences integrating various digital identities. This approach prepares students for a globally connected world by emphasizing the importance of networked knowledge and collaborative learning in modern education. The influence of educational technology and connectivism principles on student engagement and academic achievement has been profoundly positive. Educators report that using educational technologies and adopting connectivism approaches have encouraged more interactive and participatory learning environments. The enhanced student engagement has resulted in increased participation and a profound comprehension of the subject matter, consequently leading to improved academic performance.

However, while beneficial, adopting educational technologies and connectivism principles has presented challenges, such as resistance to technological changes and the necessity for continual adaptation and professional development among educators. In response to these challenges, educators have continually implemented innovative solutions to refine teaching methods to optimize learning outcomes. In anticipation of the future of higher education, participants in the study predict ongoing developments in teaching methods propelled by educational technology advancements and connectivism principles. The educators foresee a profound incorporation of educational technology by combining traditional pedagogical frameworks with contemporary digital approaches. The predictions frame the ongoing narrative in higher education, which offers a comprehensive view of potential transformations, the challenges to be navigated, and the promising prospects in the future.

Implications for Policy or Practice

The compelling influence of educational technology on student engagement and academic achievement signifies the importance of higher education institutions continuing to advocate for implementing educational technology tools by supporting policies and practices. It is essential to prioritize investments in technological infrastructure, provide enduring professional development for instructors, and establish coherent teaching standards focusing on the significance of technology in enriching the learning experience. Furthermore, aligning institutional guidelines with connectivism principles can foster enhanced collaboration and interconnectedness within learning frameworks, thereby supporting students' success in the digitally enhanced learning environment.

Implications for Policy

This research endeavor revealed effective strategies and potential challenges to ensure that educational technologies are maximized for improving learning outcomes. Ultimately, policymakers have significant influence in shaping the future of education by thoughtfully allocating funds, providing legislative support, and prioritizing research and evaluation. The prioritization of educational efforts will enhance adaptability to the evolving needs of an increasingly interconnected digital world. The policymakers significantly influence the establishment of conducive conditions for integrating educational technology and embracing connectivism within higher education institutions.

Institutions must prioritize critical areas to leverage educational technologies fully. Allocating funding and resources is of the utmost importance for advancing technological capabilities within educational environments. Securing increased funding is paramount in establishing sustainable technology infrastructures within educational institutions and

guaranteeing universal student access to crucial digital tools and resources. Investing in the continuous professional development of educators is crucial. This investment provides instructors with the necessary skills to effectively incorporate innovative technology and instructional practices and enhances their ability to deliver superior education (Huda, 2019).

Furthermore, it is crucial to establish and enhance legal frameworks to foster educational progress and ensure the safeguarding of data privacy and security, offering a comprehensive approach to the use of technology in educational settings. Policymakers can help integrate technology into institutions by establishing precise rules and standards guaranteeing the upholding of ethical standards and protecting student information. Lastly, it is crucial to provide support for research and evaluation efforts. Policymakers can gain valuable insights to shape future educational policies and initiatives by funding research projects that assess the influences of technology-enhanced learning and connectivism.

Implications for Practice

As educational paradigms shift towards technology-enhanced and connectivism approaches, practical involvement by all stakeholders, administrators, educators, and parents will be essential. The invested parties must consider various strategic actions to navigate this transformation effectively. Firstly, curriculum development is a critical area where administrators must collaborate closely with educators. This collaboration should focus on integrating technology and connectivism principles into the curriculum. By making these components integral to course design and implementation, educational programs can better align with the demands of a technological and interconnected learning environment. This approach ensures that the curriculum supports the use of educational technologies and promotes the connectivism ideology of learning through networks and shared knowledge.

Secondly, continuous professional development is vital for educators. As new technologies and pedagogical strategies emerge, educators must continually adapt and enhance their skills. Professional development training is instrumental in enabling educators to stay abreast of technological advancements and in enhancing educational technology effectiveness in the classroom. This ensures their ability to effectively implement and leverage new tools and methods, to improve student learning outcomes. Thirdly, community engagement extends the learning environment beyond the traditional classroom, which encourages the involvement of families and the broader community in educational technology initiatives and can foster an enriched learning atmosphere. This involvement can lead to enhanced support systems for students and broaden the educational possibilities available to them while leveraging the collective knowledge and resources of the community.

Lastly, there is a need to improve assessment practices to better align with the interactive and collaborative nature of connectivism learning. Traditional assessments may not fully capture the depth of understanding and networked learning that connectivism fosters. Educators can gain precise information about student progress by developing assessment techniques that reflect the interactive and collaborative processes inherent in connectivism learning and identify specific areas that require attention, through enhancing overall educational outcomes. These actions represent a comprehensive approach to embracing and facilitating the transformation towards technology-enhanced and connectivism education, which ensures that all stakeholders are actively involved in creating a holistic and practical learning environment.

Empirical and Theoretical Implications

The purpose of this section is to address the theoretical and empirical implications of this study. Through connectivism theory, leveraging educational technology provides a rich context

for examining its theoretical and practical implications, contrasting with traditional educational theories and the broader landscape of educational technology literature. In the focus of educational technology, integrating both asynchronous and synchronous technological tools into pedagogy is essential for enhancing student engagement, academic performance, and retention.

Research efforts from Chandrappa (2018) and Downes (2022) support this demand, emphasizing the significant benefits of integrating these technologies while also highlighting a persistent gap in empirical strategies for effective implementation (Chandrappa, 2018; Downes, 2022). This study addresses the gap in the literature by examining the experiences of educators at public universities in the southern region of the United States who use educational technology within the framework of connectivism to enhance student engagement and academic achievement.

Connectivism, developed by Siemens (2004), is particularly relevant in today's higher education teaching and learning environment. The theory departs from traditional educational theories like behaviorism, cognitivism, and constructivism, which focus on internal learning practices by emphasizing the role of networks and technology in learning processes. Siemens's connectivism theory suggests that learning is no longer an individualistic endeavor in our digital era but a networked activity that happens across a spectrum of interconnected environments (Siemens, 2004). This theoretical transformation is critical as it aligns with the increasing emphasis on digital literacy and collaborative learning in sustainable modern education, which contrasts with traditional theories prioritizing individual cognition and inactive knowledge acquisition.

The study's findings support recent reports within academic literature regarding the positive influences of technology on educational outcomes (Asif et al., 2021; Donham et al.,

2022). For instance, Asif et al. (2021) and Donham et al. (2022) report when effectively applied, educational technologies enhance student engagement and academic success by promoting more interactive and participatory learning environments. The findings support the practical application of connectivism by illustrating how networked learning can effectively foster educational achievements. However, implementing such technologies is not without challenges. This study acknowledges the rapid technological advancements and the need for continual professional development for educators to stay abreast of emerging innovative educational technology and methods (Mutanga & Molotsi, 2022; Tarazi & Ruiz-Cecilia, 2023). These challenges are echoed in comprehensive literature by highlighting issues like technological resistance, the digital divide, and professional development, which can impede the adoption of effective educational technologies (Lehrman, 2023; Ustun & Tracey, 2019; Huda, 2019).

While connectivism offers an imperative framework for understanding the complexities of learning in a networked society, its practical application requires an enhanced approach to address these empirical challenges. Future research is encouraged to explore diverse educational settings and consider the complex interaction between technology, pedagogy, and connectivism principles to further refine the integration of technology tools in higher education. Future research could generate significant insights into overcoming the barriers to technology integration and enhancing the pedagogical effectiveness of educational technologies in higher education (Masenya, 2021; Utecht & Keller, 2019).

Empirical Implications

The research is grounded in Siemens' connectivism theory (2004) and explores the practical implications of integrating educational technologies within higher education environments. The study examines the real-world implementation of technology platforms to

facilitate collaborative and networked learning, aligning with Siemens' statement that learning in the digital era thrives through connections and networks (Siemens, 2004). By documenting the experiences of educators at public universities in the southern region of the United States, the study provides tangible evidence of how these technologies enhance student engagement and academic achievement. Furthermore, both Chandrappa (2018) and Downes (2022) have emphasized the critical role of integrating both asynchronous and synchronous technologies to improve educational outcomes (Chandrappa, 2018; Downes, 2022). This study builds on these discussions by probing into the actual implementation of educational technologies and identifying specific challenges like technical issues and resistance to change, as mentioned by Ustun and Tracey (2019). These insights address a significant gap in the literature, which often overlooks the practical barriers to technology integration in higher educational settings (Ustun & Tracey, 2019).

Additionally, this study's methodological approach combines phenomenological insights with connectivism principles and offers a unique contribution to the field of educational research. This approach captures educational technology's personal and professional influence on educators and aligns closely with the core principles of connectivism by emphasizing diverse learning pathways and the critical role of knowledge networks (Siemens, 2004; Moustakas, 1994). The findings from this connectivism perspective reveal both the struggles and successes associated with educational technology integration while providing a more comprehensive understanding than theoretical discussions might offer.

The empirical findings reveal the challenges of the digital divide and the need for comprehensive support systems for educators, which echo concerns highlighted by Paul (2021) and other scholars (Matee et al.; Mullen, 2020; Paul, 2021). These insights confirm the

documented impediments in technology adoption and stress the need for enhanced training and support, which reveals significant areas for future research and policy development. This study enhances our understanding of how digital educational technologies can be integrated more effectively into educational frameworks. Connecting theoretical concepts with practical implementations suggests reevaluating how connectivism principles are incorporated into education and promoting strategies that consider both technological and humanistic aspects of teaching and learning. This comprehensive approach aims to enhance the resilience and effectiveness of educational practices in the evolving technology-driven environment by leading to the essential integration of innovative technology in education that supports educators and students in continuously enriching learning processes.

The research focuses on integrating educational technology into course designs to enhance student engagement and academic achievement. This notion is supported by Chandrappa (2018) and Downes (2022), who build upon the concept proposed by Siemens (2004) and Astin (1999) by emphasizing the creation of interactive and collaborative learning environments. The use of digital platforms, such as discussion forums and collaborative projects, reinforces the notion that meaningful digital interactions can significantly influence students' ability to retain information and excel academically, as highlighted by Nortvig et al. (2018) and Tarazi & Ruiz-Cecilia (2023).

The study demonstrates how educational technologies integrate behaviorist, cognitivist, and constructivist methods into a connectivism framework, combining connectivism with conventional educational concepts. Downes' (2022) version of connectivism integrates elements from known learning theories to meet the challenges of current educational needs successfully. The study emphasizes the use of technology by educators to create interactive and customized

learning experiences by aligning with the ideas presented by Driscoll (2000) and Siemens (2004) about the transformative power of learning technologies. It also supports the idea that technology-enhanced learning can meet both traditional educational objectives and contemporary needs.

The study's results emphasize the significance of educational technology in advancing learning sustainability, which aligns with the connectivism focus on the lasting importance of learning networks. Technologies, such as MOOCs and online collaboration tools, not only assist in achieving immediate learning goals, but also cultivate the skills needed for lifelong learning. These technologies contribute to the long-term effectiveness of educational results, as supported by Farhan and Alhalafawy (2023). Based on empirical evidence, the research confirms that educational technology significantly improves student engagement. Interactive and collaborative tools promote the formation of learning networks, which encourage involvement and align with the research conducted by Kuh (2003) and Zhao & Kuh (2004).

The focus on networked learning environments aligns with the connectivism perspective that learning is primarily about establishing connections while highlighting the profound influence of technology on education (Siemens, 2004). Additionally, the study stresses the significance of sustainability in learning, and emphasizes that incorporating connectivism principles using educational technology tools meets current educational requirements and empowers students with the skills needed for continuous learning throughout their lives. This is consistent with scholarly arguments in literature on the need for educational methods to adapt and change in response to ongoing technological progress and the ever-changing nature of knowledge (Deaconu et al., 2022; Downes, 2022).

This research study vividly illustrates the transformative potential of digital technology in

higher education, with a focus rooted in connectivism perspectives. It offers valuable insights into the strategic use of these technology tools to improve student engagement, foster sustainable learning, and blend classic and current educational concepts, thereby better equipping students for the demands of the digital era. The study validates current literature and provides innovative insights into implementing connectivism in educational environments by enhancing the educational research's theoretical and empirical breadth.

Theoretical Implications

The study both reaffirms and challenges existing theories and lends support to Siemens' (2004) and Downes' (2022) assertions about the importance of networks in learning. The research study also identifies potential areas for the expansion of connectivism, particularly concerning the emotional and support dimensions of learning with educational technology. This extension is vital as it opens the door to future theoretical and practical explorations into how emotional support and resistance management can be effectively addressed within the connectivism framework. The study's findings help bridge a gap in the literature by tackling the issue of educators facing difficulties in leveraging educational technology tools in higher education learning environments to foster student academic achievement and retention.

The examination of connectivism in this study enhances our comprehension of how digital technology tools are implemented in contemporary educational settings while affirming and expanding upon George Siemens's connectivism theoretical framework. Connectivism suggests that learning is about creating connections and networks, as demonstrated by educators' use of platforms such as Canvas, Blackboard, and Microsoft Teams. These tools are not simply supplementary to traditional learning methods but are integral to establishing the networks Siemens (2004) considers essential for learning in the digital era. The study's findings indicate

that educators leverage these tools to improve connectivity and collaboration by reinforcing connectivism's assertion that the digital era demands such networked learning environments (Siemens, 2005).

Additionally, the theoretical implications confirm that connectivism theory provides a practical foundation for understanding the effective use of educational technology in higher education. However, practical applications must consider how technology can be leveraged to foster virtual connections and facilitate meaningful human interactions to enhance student engagement and academic achievement. By prioritizing the aligned findings, the study significantly broadened the practical applications of connectivism theory and addressed the existing research gap. Furthermore, the study proposes innovative approaches to effectively implementing educational technology and established network connections essential for meaningful learning experiences.

The study also highlights a significant tension within connectivism, specifically concerning the balance between the use of technology and human interaction. While connectivism advocates for integrating technology in learning, the findings reveal challenges in ensuring technology supports rather than replaces human interactions (Downes, 2019). The challenges suggest a gap in connectivism theory, which may not fully account for the distinctions of facilitating effective human connections alongside digital technology integration. It is evident that connectivism must evolve to offer effective strategies for maintaining this equilibrium while ensuring that technology serves as a facilitator of human interaction rather than an impediment.

In addition, the study affirms connectivism's principle of acknowledging the diversity of learning paths by incorporating multimedia tools catering to different learning styles and preferences (Alismaiel et al., 2022). This alignment with connectivism accentuates the theory's

relevance in addressing the needs of diverse learners and confirms its assertion that learning can and should occur in various forms and across different platforms. Educators like Diana exemplify a flexible approach to adopting technology. This approach supports connectivism's emphasis on learners' ability to select and utilize relevant technological tools in their learning process. Furthermore, it aligns with the principle of connectivism by advocating for learners to have control over their educational interactions. It also proposes an expansion of connectivism, placing learner autonomy at the forefront. (Koh, 2019).

Finally, the study's identification of flexible technology adoption among students and the corresponding adjustments by educators illustrate connectivism in action. This practical application shows how educators can connect specialized information sources to diverse learner needs while supporting the theory's claim that learning is personalized and context-dependent (Dawo & Sika, 2021). This aspect of the study confirms the applicability of connectivism and extends its implications by demonstrating how educators can operationalize these principles in varied educational contexts. The pedagogical approach ensures that the fundamental principles of connectivism are directly linked to tangible results while offering a comprehensive understanding of educational technology's possibilities and constraints in creating connected and engaging learning environments for student academic achievement (see Table 5).

Table 5

Theoretical Implications

Theoretical Component	Study Findings	Implications for Connectivism Theory
Networked Learning	Educators are progressively using digital tools like Canvas, Blackboard, and Microsoft Teams to enhance student	**Expands on Connectivism**: This concept reinforces the idea that learning occurs across a network of connections. It suggests that digital tools effectively create these networks, validating

	engagement and collaboration.	connectivism's relevance in digital-age education.
Importance of Technology in Learning	Educators like Diana adopt a flexible approach to technology, introducing tools to students and allowing them to choose their level of engagement.	**Strengthens Connectivism**: Supports the theory that in the digital era, the ability to navigate and choose relevant technological tools is part of effective learning. Highlights the need for educators to facilitate access to technology while respecting individual learning paths.
Diverse Learning Modalities	The use of various multimedia tools (videos, interactive quizzes, discussion boards) demonstrates that educators are catering to diverse learning preferences.	**Enhances Connectivism**: Emphasizes that learning can and should occur in various forms, using different types of information sources. This aligns with connectivism's emphasis on the diversity of learning paths in networked environments.
Building Effective Human Connections	Despite the integration of technology, educators face challenges in ensuring that technology enhances rather than replaces human interactions in learning processes.	**Challenges for Connectivism**: Indicates a need for strategies within connectivism to ensure that technology acts as a bridge rather than a barrier in human connections, stressing the balance between digital tool use and interpersonal interaction in learning.
Adapting to Learner Needs	Technology adoption varies among students; educators adjust their methods to accommodate different technology comfort and capability levels.	**Connectivism in Practice**: Confirmations that connectivism's principle of learning, which is a process of connecting specialized information sources, is practical. Educators must adapt technology to meet varied learner needs, thus supporting the connectivist claim that learning is highly personalized and context-dependent.

Limitations and Delimitations

The research focused on the lived experiences of educators leveraging educational technology and connectivism to enhance student engagement and achievement in higher education. However, the study revealed several limitations, including inconsistency in educators'

technological proficiency and access, which could affect the findings' generalizability. Additionally, the reliance on self-reported data might introduce biases. Deliberate delimitations were set, which restricted the study to public universities in the southern region of the United States to maintain a manageable scope and focus on a specific educational context. These boundaries were essential for managing the research scale and emphasized the need for further exploration in more diverse educational settings.

Limitations

From a geographical standpoint, the focus on public universities in the southern region of the United States limits the results. The unique geographic characteristics of the findings and experiences restricted the direct applicability to areas with different educational standards and technology infrastructures. Additionally, the participant's age, ethnicity, and academic field diversity were not comprehensive, which potentially biased the findings toward a demographic more receptive to technology advancements than the broader academic community to include international educators from various countries. Another limitation arises from the potential for technological malfunctions during data collection, which adversely influenced the comprehensiveness and accuracy of the transcript and gathered data. The study's ability to capture a wide range of opinions and experiences among educators may be constrained by selection bias favoring participants with a positive attitude towards technology use in educational settings, potentially excluding educators who are resistant or less proficient in using technology.

Delimitations

The deliberate decision to focus exclusively on higher education, particularly within public universities, was made to explore the integration of educational technology and connectivism in contexts that are more open to innovation. This emphasis allowed for a

comprehensive examination of the complex interactions between instructors and technology tools in an influential environment that reflects more significant trends in higher education. Another critical consideration was choosing a transcendental phenomenological approach over hermeneutic phenomenology. This method was chosen to prioritize the direct examination of educators' real-life experiences and to be free from the influence of preconceived ideas or interpretations that may bias the results. This methodological decision focused on gathering unfiltered perspectives, which resulted in a more accurate understanding of the effects and challenges educators encounter when incorporating technology and connectivism into their teaching.

The research was purposely tailored to technology-enhanced learning contexts, excluding traditional educational settings that do not use technology. This deliberate choice narrowed the study's focus to innovative educational approaches to provide valuable insights into classroom dynamics where technology plays a pivotal role. Finally, the decision to prioritize connectivism as the guiding concept for this study was intentional, aimed at investigating how contemporary educational theory is put into practice. The research examined the benefits and challenges of implementing connectivism in real-world educational settings incorporating networked learning and digital connection. The carefully established constraints and delimitations clearly defined the scope of the research and enhanced its significance by concentrating on cutting-edge educational innovation contexts and dynamics. The resulting insights significantly contribute to comprehending technology and connectivism in higher education, guiding future research and practical implementations in this evolving scope of higher education learning.

Recommendations for Future Research

After carefully considering the findings, limitations, and scope of the present

investigation, several promising avenues for future research could significantly contribute to our understanding of integrating educational technology and connectivism in higher education. The proposed research initiatives are designed to explore new areas, address current study limitations, and employ diverse research methods to gain deeper insights with broader applicability. For future research initiatives, it is essential to broaden the geographic and demographic reach to encompass a diverse array of educational settings. This should include private institutions, community colleges, and universities located beyond the southern region of the United States. By doing so, we can facilitate a more comprehensive assessment of findings across various educational cultures and infrastructures. Additionally, a more diverse participant pool, encompassing individuals from different ethnic backgrounds, age groups, and academic disciplines, promises a holistic understanding of the perception and application of educational technology and connectivism within a more comprehensive academic context.

Furthermore, longitudinal studies are encouraged; these would offer invaluable insights into the enduring influences of educational technology and connectivism on teaching and learning processes. The longitudinal approach facilitates the observation of progressive changes and patterns, thereby providing a comprehensive understanding of educational methods' sustained effects and evolution on student achievements. In addition, employing mixed-methods techniques is recommended to enrich future research endeavors. This entails blending qualitative depth with quantitative breadth, incorporating quantitative data, such as analytics derived from learning management systems and performance indicators with qualitative insights from interviews and observations. This comprehensive approach would enable a thorough examination of the effects of technology-enhanced learning environments. Moreover, interdisciplinary research integrating educational technology with knowledge from psychology,

sociology, and information science is a viable means to amplify our understanding of how connectivism principles affect learning processes and outcomes.

Research focused on understanding the reluctance of instructors and students to implement technology is crucial for making significant progress. A comprehensive examination of psychological, cultural, and institutional barriers will form the basis for developing targeted strategies to promote the acceptance and utilization of advanced educational technology. Additionally, comparative studies on the effectiveness of different technology tools and platforms are recommended. This could provide valuable insights into the specific elements that have the most significant influence on enhancing or impeding learning and engagement. It is recommended that the effectiveness of professional development efforts be evaluated in equipping educators to integrate connectivism and educational technology into their teaching strategies. The assessment can generate valuable insights into training programs, potentially leading to enhanced training models that encourage instructors' proficiency and confidence in employing innovative educational methods.

Finally, assessing the influence of educational policies on adopting technology and connectivism methods offers essential insight for policymakers. Recognizing stakeholders who create policies that support or impede the effective incorporation of modern educational methods, and offering suggestions for enhancements, holds significant promise for advancing educational technology integration and connectivism. These recommendations have been meticulously formulated to enhance our comprehension and implementation of educational technology and connectivism, thereby propelling the progression of education in an increasingly technology-driven world.

Conclusion

This research study explores the integration of educational digital technologies in higher education, grounded in the connectivism theory proposed by George Siemens (2004). Through a transcendental phenomenological approach, the study describes the lived experiences of educators at public universities in the southern region of the United States, while providing empirical evidence that supports the theory's emphasis on the importance of networks and connections in learning. The research highlights how educators employ digital tools to enhance collaborative and networked learning environments, thus fostering student engagement and academic achievement.

The study confirms existing literature that emphasizes the critical role of integrating both asynchronous and synchronous digital technologies in education to improve student engagement, academic success, and retention. It addresses gaps in the literature by offering detailed insights into the practical challenges of technology integration, including technical issues and resistance to change. By documenting these challenges, the study stresses the necessity for ongoing support and professional development training for educators to leverage educational technology.

From a methodological perspective, merging phenomenological insights with connectivism principles provides an innovative approach to educational research. This method captures educators' complex, personal experiences with technology, aligning with connectivism's focus on diverse learning paths and vital knowledge networks. The two key takeaways from this research study include Networks and Connections and Support and Training Needs. The first key point, Networks, and Connections, emphasizes the importance of educational technology tools in creating collaborative learning environments that adhere to connectivism principles. This research finding is vital for educational institutions using technology to improve student

engagement and academic achievement outcomes. Secondly, Support and Training Needs reveal there is a critical need for comprehensive support systems and professional development training for educators to overcome barriers to integrating educational technology. Overcoming barriers to integrating educational technology is essential for the successful adoption and implementation of educational technologies within higher education learning environments.

In conclusion, the study reaffirms the theoretical foundations of connectivism theory regarding the importance of networks in the educational technology learning process. It also expands the theory by highlighting the practical challenges and support needs in educational technology integration. This study appeals for a broader implementation of connectivism principles, encompassing strategies that address educational, technological advancements, as well as the humanistic aspects of learning while suggesting a unique holistic approach to educational practices in the technology-driven era.

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Appendix A

Request for Permission Email

Subject: Formal Request for Authorization to Conduct Research through Direct Communication with Faculty Members

Dear Sir/Ma'am,

As a doctoral candidate at Liberty University's School of Education, I am presently engaged in a research study integral to my Doctor of Philosophy program in Higher Education Educational Leadership. The title of my research project is "The Lived Experiences of Educators Leveraging Educational Technology and Connectivism for Fostering Academic Achievement in Higher Education: A Transcendental Phenomenological Study." The purpose of my research is to examine the subjective experiences of educators who employ educational technology to augment student engagement and academic performance through connectivism principles in diverse learning environments. This research will specifically focus on public four-year universities located in the southern region of the United States. The success of this study is contingent upon the ability to actively engage with faculty members who are spearheading the implementation of these approaches in their pedagogical practices. This interaction will provide a comprehensive understanding of the underlying dynamics.

Therefore, I respectfully request permission to contact and communicate directly with faculty members at your institution for the purposes of this research. Participants will be presented with informed consent information prior to participating. Taking part in this study is completely voluntary, and participants are welcome to discontinue participation at any time.

This study will employ structured interviews and focus groups to explore faculty members' experiences with educational technology and connectivism principles in higher education. Writing prompts will be used to obtain real-world insights and data on the integration's efficacy and obstacles. All data will be anonymized, complying with ethical research principles.

I would be grateful for the opportunity to discuss this request further at your earliest convenience. If you choose to grant permission, please provide a signed statement on an official letterhead indicating your approval. A permission letter document is attached for your convenience. Please do not hesitate to contact me via email at [redacted] or phone at [redacted] should you have any questions or require additional information.

Thank you for considering this request. I look forward to working together to advance our understanding of educational technology and its impact on higher education.

Sincerely,

Cynthia Plueger
Ph.D. Candidate

School of Education
Liberty University
[redacted]

Appendix B

Recruitment Email

[Date]

[Recipient]
[Title]
[Company]
[Address 1]
[Address 2]
[Address 3]

Subject: Invitation to Participate in Educational Technology Research Study

Dear Educator,

My name is Cynthia Plueger. I am a graduate student in the School of Education at Liberty University. I am conducting research as part of the requirements for a Doctor of Philosophy in Higher Education: Educational Leadership degree. I am inviting you to participate in a research study exploring the integration and impact of educational technology in higher education settings, focusing on connectivism principles and their role in fostering student engagement and academic achievement.

The purpose of my research is to determine the experiences of educators employing educational technology in the higher education learning environment for student engagement and learning outcomes. Additionally, the research will explore how connectivism principles shape the use of educational technology to form connections for increased student engagement and attrition. Specifically, the study explores educators' strategies to integrate technology into their teaching practices. Examine the effectiveness of these technological tools and methods in enhancing student engagement and academic performance. Explore the role of connectivism principles in shaping the use of educational technology in higher education. I am writing to invite eligible participants to join my study.

Participants in the study must be tenured or non-tenured faculty members from a public four-year university in the United States southern region. The participants must have varying knowledge and experience in using educational technology and knowledge of connectivism theory. Taking part in this research project is voluntary. Your participation would involve a recorded individual interview of approximately 45-60 minutes in a video-recorded session through Microsoft Teams or in person, a 30-minute letter-writing activity after the individual interview, a 60-minute Focus Group in a video-recorded session through Microsoft Teams, and a second 30-minute letter-writing activity after the Focus Group.

The member-checking process will be implemented by granting participants access to the transcriptions to ensure the accuracy of their opinions. Participants must provide their names and other identifying information as part of this research. It is important to note that all data collected

from participants will be kept strictly confidential. Names and other identifying information will be requested as part of this study, but participant identities will not be disclosed.

Why Your Participation Matters:

Your insights as an educator are invaluable to this study. Your experiences and perspectives will contribute significantly to understanding the evolving landscape of educational technology in higher education and expand the reach concerning the application of connectivism principles to enhance teaching and learning experiences.

Next Steps:

To participate, please click the link [redacted] to complete the screening process. I am available by telephone at [redacted] or by email at [redacted] to discuss any questions or concerns you might have regarding your participation. A consent document will be sent to your provided email if you are determined to be eligible for this study. If you choose to participate, you must sign a consent document and return it to me via email before any procedures can begin.

Thank you for considering this invitation. Your participation has the potential to make a meaningful contribution to the field of educational technology and higher education. I look forward to working with you and gaining insights from your valuable experiences.

Sincerely,

Cynthia Plueger
Ph.D. Candidate
School of Education
Liberty University
[redacted]
[redacted]

Appendix C

Follow-up Email

[Insert Date]

[Recipient]
[Title]
[Company]
[Address 1]
[Address 2]
[Address 3]

Dear Potential Participant,

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for a Doctor of Philosophy in Higher Education: Educational Leadership degree. Two weeks ago, you were sent an email inviting you to participate in a research study. This follow-up email is being sent to remind you to contact me if you would like to participate and have not already done so. I am conducting my research to better understand a phenomenon regarding the experiences of educators employing educational technology in the higher education learning environment for student engagement and learning outcomes. Additionally, the research will explore how connectivism principles shape the use of educational technology to form connections for increased student engagement and attrition. The deadline for participation is [Date].

Participants in the study must be tenured or non-tenured faculty members from a public four-year university in the United States southern region. The participants must have varying knowledge and experience in using educational technology and knowledge of connectivism theory. Taking part in this research project is voluntary. Your participation would involve a recorded individual interview of approximately 45-60 minutes in a video-recorded session through Microsoft Teams or in person, a 30-minute letter-writing activity after the individual interview, a 60-minute Focus Group in a video-recorded session through Microsoft Teams, and a second 30-minute letter-writing activity after the Focus Group.

The member-checking process will be implemented by granting participants access to the transcriptions to ensure the accuracy of their opinions. Participants must provide their names and other identifying information as part of this research. It is important to note that all data collected from participants will be kept strictly confidential. Names and other identifying information will be requested as part of this study, but the information will remain confidential.

To participate, please complete the criteria screen form by clicking on the following link: [redacted]. I am also available to discuss any questions or concerns you might have regarding your participation.

If you meet the participant criteria, I will email you a consent form that you will sign and return to electronically before any procedures begin. The consent document contains additional information about my research. I will contact you to schedule an interview once I have received the consent document.

Sincerely,

Cynthia Plueger
Ph.D. Candidate
School of Education
Liberty University
[redacted]

Appendix D

Educators in Higher Education Criteria Screening Form

* Required

1. You are a faculty member (tenured or non-tenured) at a public four-year university in the southern region of the United States.

   Yes
   No

2. You have experience or knowledge in employing educational technology.

   Yes
   No

3. You are familiar with or have some understanding of connectivism theory.

   Yes
   No

4. Please specify the university or college where you are currently employed.

5. Are you a tenured, tenure-track, or non-tenured faculty member?

6. What is your current department and role/title within the university?

7. How would you describe your level of experience with educational technology?

   Beginner
   Novice / Basic
   Intermediate / Limited
   Advanced / Expert

8. How familiar are you with connectivism as a learning theory?

9. Have you applied principles of connectivism in your educational practices? If yes, please provide brief examples.

10. Are you interested in participating in this research study?
    If yes, please provide your preferred contact information (email and phone number).

11. Further Information and Consent:

    Should you choose to participate, further information and a consent form will be provided to you, detailing the research procedures, your rights as a participant, and measures taken to ensure your privacy and the confidentiality of your responses.

    Yes, Please send the Consent Form
    No, Thank you

Appendix E

Consent

Title of the Project: The Lived Experiences of Educators Leveraging Educational Technology and Connectivism for Fostering Academic Achievement in Higher Education: A Transcendental Phenomenological Study
Principal Investigator: Cynthia T. Plueger, Doctoral Candidate, School of Education, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be tenured or non-tenured faculty members from a public four-year university in the United States southern region. As a participant, you must have varying knowledge and experience in using educational technology and knowledge of connectivism theory. Taking part in this research project is voluntary.

Please read this entire form and ask questions before deciding whether to participate in this research.

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

The purpose of the study is to determine the experiences of educators employing educational technology in the higher education learning environment for student engagement and learning outcomes. Additionally, the research will explore how connectivism principles shape the use of educational technology to form connections for increased student engagement and attrition.

What will happen if you take part in this study?

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

1. Participate in a one-on-one interview in a video and audio-recorded session through Microsoft Teams or in person, which will take 45-60 minutes.
2. Participate in answering a letter-writing prompt after the interview for approximately 30 minutes.
3. Participate in a focus group with similar educators for approximately 60 minutes in a video and audio-recorded session through Microsoft Teams.
4. Participate in answering a letter-writing prompt after the focus group session for approximately 30 minutes.

The member-checking process will be implemented by granting participants access to the transcriptions to ensure the accuracy of their opinions. Participants must provide their names and other identifying information as part of this research. It is important to note that all data collected from participants will be kept strictly confidential.

How could you or others benefit from this study?

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

Benefits to society include contributing significantly to understanding the evolving landscape of educational technology in higher education and expanding the reach concerning the application of connectivism principles to enhance teaching and learning experiences.

What risks might you experience from being in this study?

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

How will personal information be protected?

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

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

Is study participation voluntary?

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

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

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

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

The researcher conducting this study is Cynthia Plueger. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [redacted] or [redacted]. You may also contact the researcher's faculty sponsor, Dr. Traci Eshelman, at [redacted].

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

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the IRB. Our physical address is Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA, 24515; our phone number is 434-592-5530, and our email address is irb@liberty.edu.

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

Your Consent

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

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

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

_____

Printed Subject Name

_____

Signature & Date

Appendix F

Table 1

Individual Interview Questions

1. Please tell me about yourself. CRQ
2. What inspired you to become an educator? CRQ
3. Please describe your experience as an educator in higher education before your involvement with educational technology tools. CRQ
4. How would you characterize your initial perceptions of integrating educational technology into your teaching practices? CRQ
5. How would you describe your experiences with leveraging educational technology tools in your teaching practices? CRQ
6. Please elaborate on experiences with specific tools or platforms that you find particularly impactful or challenging. SQ1
7. Please explain how the basic principles of connectivism relate to your teaching methods. SQ1
8. How have the concepts of connectivism influenced your approach to leveraging educational technology tools? SQ1
9. Please provide examples of instances in which incorporating technology and applying connectivism principles have significantly influenced student involvement or academic achievements. SQ1
10. What challenges or limitations have you encountered while using these technological tools to enhance student engagement, and how did you address or overcome these challenges or limitations? SQ1

11. Please provide a more in-depth analysis of situations in which educational technology integration and connectivism did not provide the anticipated outcomes. SQ2
12. How do you perceive the relationship between educational technology, connectivism, and student academic achievement? SQ2
13. What obstacles have you faced while endeavoring to integrate technological tools and connectivism ideas in your instructional practices? SQ2
14. How has your perspective on teaching and learning evolved with integrating educational technology and connectivism principles? SQ2
15. Please provide any specific experiences that have shaped your current teaching approach regarding technology and connectivism. SQ2
16. What is your perspective on the future of educational technology and connectivism concerning your teaching methods and the broader context of higher education? SQ3
17. Please share any additional thoughts you may have regarding the research topic or any areas discussed. SQ3

Appendix G

Table 2

Focus Group Questions

1. Please discuss effective educational technology tools, their impact on classroom dynamics and student interactions, and any benefits or challenges faced using them. CRQ
2. Please describe specific examples of how you've incorporated connectivism into higher education technology in your teaching experience. CRQ
3. Considering each of your experiences, how do educational technology and connectivism affect student engagement and academic achievement, particularly in terms of shared experiences and evident disparities? SQ1
4. In your collective experiences, what reflections can you share on any patterns or observations related to student retention when implementing technology tools and connectivism principles? SQ1
5. How have your peers or collaborative efforts influenced your approach to leveraging educational technology in the classroom regarding practices or strategies adopted from each other or wish to explore further based on this group's shared insights? SQ2
6. What insight can you share regarding your perspective on the future direction of educational technology and connectivism within the context of higher education for colleague educators or institutions seeking to improve technology integration and connectivism? SQ3

Appendix H

Letter-Writing Prompt

Dear Participants,

As a doctoral candidate in the School of Education at Liberty University, I am researching to understand better a phenomenon regarding the experiences of educators who leverage educational technology and connectivism in higher education learning environments to foster student engagement and attrition. As an experienced educator, your valuable insights can significantly contribute to the research study to expand academic knowledge. Therefore, I would like to invite you to participate in our study.

Reflective Inquiry:

As part of the research, I would like to ask you to participate in a reflective activity that focuses on your educational background, specifically your experience with educational technology and connective learning nodes. The first question I would like you to consider is:

How has your approach to integrating educational technology and connectivism concepts into your teaching practices evolved over time, and how would these elements have been helpful to know earlier in your career?

Your response may include a range of topics, such as:

- Digital platforms that revolutionized pedagogical approaches
- The impact of connectivism on your teaching approach
- Strategies or instruments that have helped to establish linked learning environments
- Challenges encountered when integrating technology and strategies to overcome the challenges

My objective is to gain valuable insights into the implementation and advancement of educational technology and connectivism in teaching. Your input from your lived experiences will help to gain a profound understanding of the subject matter and provide guidance for current and future educators.

Guarantee of Privacy and Non-Disclosure:

We assure you that your participation will be confidential. Your information will be kept confidential to protect your identity, and the researcher will only access the data collected for analysis purposes.

Methods of Participation:

To participate, please send a written reply to the inquiry via email before the specified deadline of [date]. You may express your opinions at length or briefly, as you prefer. I appreciate all the thoughts and experiences shared by participants.

Acknowledging Appreciation and Providing Contact Details:

If you have any questions or need further information about this research, please contact me at [redacted] or [redacted].

Thank you for your time and consideration. I look forward to hearing your unique insights and perspectives.

Sincerely,

Cynthia Plueger
Ph.D. Candidate
School of Education
Liberty University
[redacted]
[redacted]

Appendix I

Date: 6-14-2024

IRB #: IRB-FY23-24-1111
Title: THE LIVED EXPERIENCES OF EDUCATORS LEVERAGING EDUCATIONAL TECHNOLOGY AND CONNECTIVISM FOR FOSTERING ACADEMIC ACHIEVEMENT IN HIGHER EDUCATION: A TRANSCENDENTAL PHENOMENOLOGICAL STUDY
Creation Date: 12-21-2023
End Date:
Status: Approved
Principal Investigator: Cynthia Plueger
Review Board: Research Ethics Office
Sponsor:

Study History

Submission Type	Review Type	Decision
Initial	Limited	Exempt - Limited IRB

Key Study Contacts

Member Traci Eshelman	Role Co-Principal Investigator	Contact [redacted]
Member Cynthia Plueger	Role Principal Investigator	Contact [redacted]
Member Cynthia Plueger	Role Primary Contact	Contact [redacted]