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An Exploratory Case Study of Students' Blended Learning Experiences During Post Emergency Learning

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AN EXPLORATORY CASE STUDY OF STUDENTS' BLENDED LEARNING EXPERIENCES DURING POST EMERGENCY LEARNING

A Dissertation

By

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ABSTRACT

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The COVID-19 pandemic has accelerated the integration of technology in classrooms. This has highlighted the need for a deeper understanding of how students experience these learning environments. In response, this case study explored how students experience blended learning in post emergency learning through a digital equity lens. The analysis of interview data revealed six major themes, which yielded three key findings. These findings emphasize the need to embrace a simplified approach to technology integration, refine instructional practices to effectively use technology as a supplement rather than a replacement for traditional tactile elements, while also advancing digital literacy that builds high yield digital capital. This case study significantly contributes to the discourse surrounding effective instructional practices within blended learning as well as broader discussions on digital equity. The case study offers actionable implications for educators, policymakers, and researchers across curriculum design, pedagogical practices, and professional develop that empowers educators to implement successful blended learning initiatives using a digital equity lens. Furthermore, future research may explore various instructional strategies, models, and differentiated instructional practices that foster equitable experiences for all students in blended learning classrooms.

DEDICATION

With immense gratitude, I thank God for guiding me through this journey, blessing me with a loving family whose unwavering support has been my greatest strength. To my loving family, I'm so grateful for your support, encouragement, and belief in my potential, which has empowered me to pursue excellence in my academic endeavors. This milestone would not have been possible without your love and support. Thank you!

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CHAPTER I

INTRODUCTION

This case study explored the blended learning experiences of students in post emergency learning. The following research question guided this case study:

> How did 12th grade students, within the same public school in lower south Texas, experience blended learning in post emergency learning?

This case study gained insights from literature primarily centered on blended learning with digital equity as its theoretical framework. This framework consisted of fundamental concepts such as digital capital and broader discussions surrounding the digital divide. Additionally, in this case study, I conducted interviews with high school students enrolled in the same public school in Texas, during the 2022-2023 school year. Interview data collected from participants offered insights into students' blended learning experiences post emergency. Overall, this dissertation aimed to offer insight into how students experience blended learning and what this might mean in terms of issues related to digital equity. Toward these ends, Chapter I begins by discussing the background of the problem for the study. Then, the chapter provides an overview of the research design utilized in this exploratory case study. Lastly, the chapter describes the significance of the study and provides definitions for key terms used within the study.

Background of the Problem

The background of the problem, within the context of this study, finds its roots in literature centrally focused on blended learning and its intersections with digital capital and digital divide in K-12 educational landscape. Literature such as Gorski (2009), Staker & Horn (2012), U.S. Department of Education (2017), and Resta, et al., (2018) among others (Ritzhaupt et al., 2013; Apps, et al., 2019), had explored the integration of educational technology in K-12 settings prior to the COVID-19 pandemic. However, the onset of the pandemic catalyzed a significant shift towards emergency learning (fully online) followed by simultaneous learning modalities (Fisher et al., 2021). Despite being a subject of interest for many years, blended learning encountered unprecedented challenges during the 2019-2020 school year, due to the COVID-19 pandemic (U.S. Department of Education, 2024), as illustrated in Figure 1.

Figure 1: Educational Landscape Shifts

This transition, depicted in Figure 1 as emergency learning, disrupted traditional teaching and learning approaches, raising questions about effective implementation strategies for online learning (U.S. Department of Education, 2024). While the pandemic accelerated the adoption of educational technology in many schools, it also exposed disparities in access and usage among students (Moldavan, et. al., 2021; Novak & Tucker, 2021; U.S. Department of Education, 2024).

Many students encountered difficulties in effectively navigating online learning environments despite school districts' efforts to provide physical access to digital tools (Moldavan, et. al., 2021; U.S. Department of Education, 2024). Although this abrupt transition to emergency learning may have shined light on existing inequities, it did not signal the end of educational technology in K-12 education (Novak & Tucker, 2021). On the contrary, literature suggests that educational technology will continue to play a significant role in education, as its usage from emergency learning blends into post-emergency landscapes (Jones & Sharma, 2020; Hodges et al., 2020; Novak & Tucker, 2021; Picciano et al., 2021; Singh et al., 2021; Bergdahl & Bond, 2022). However, despite the increased access to digital devices due to emergency learning, equitable access to information and communication technologies remains as a significant challenge post-emergency (Moldavan, et. al., 2021; Novak & Tucker, 2021). As school districts have mostly settled back into brick-and-mortar classroom settings, educators are looking to meet the diverse needs of students in flexible landscapes, that emerged from emergency learning, by embracing blended learning to seamlessly navigate between digital and traditional modalities (Novak & Tucker, 2021). However, it is important to note that the uncertainty in implementation of blended learning pedagogy (Bergdahl & Bond, 2022; Picciano, et al., 2021; Zahedi, et al., 2023) may exacerbate digital equity issues (Novak & Tucker, 2021). We need further research on student experiences rather than testing effectiveness (Oliver & Trigwell, 2005; Picciano, et al., 2021). Solely focusing on students' lived experiences of using educational technology prior to and during the pandemic's emergency phase is crucial for learning. However, if we limit our focus on this period, it may hinder our progress towards digital equity, rather we must look beyond the emergency phase. Toward these ends this research utilized a digital equity lens to explore how students experience blended learning in post-emergency learning.

Research Design

This case study utilized qualitative methods of data collection to explore the blended learning experiences of ten high school seniors in post emergency learning, during the 2022-2023 school year at Valley High School. The case study consisted of 10 participants that represented various Career Technical Education (CTE) endorsements offered at Valley High School. The campus was situated in a border town in southern Texas, known for its predominantly Hispanic student population. Valley High School was 29 years old at the time of the study and featured a diverse array of CTE endorsements, fine arts, and an early college program. The demographic makeup of the student body, as reported in the 2021-2022 academic year, included 0.1% African American, 0.1% White, and 99.8% Hispanic students, with the majority being economically disadvantaged (96.7%) and English Language Learners (26.5%).

The recruitment process unfolded through a randomized approach, facilitated by a list of CTE endorsements provided by the school counselor. I invited participants to partake in this case study via telephone outreach with their parents/legal guardians. Individual semi-structured interviews, guided by a protocol (Appendix D), were conducted in March 2023. The protocol was comprised of four open-ended questions, each accompanied by follow-up questions aimed at building rapport and encouraging authentic sharing of experiences. These questions were tailored to explore the participants' blended learning experiences. Interviews were conducted in the campus library after school, each session lasting between 30 to 60 minutes. Each participant also took part in a follow-up semi-structured interview, guided by a protocol (Appendix E), to explore emerging themes and ensure that I gained a comprehensive understanding of their experiences. Subsequently, data analysis was guided by Moustakas (1994), Creswell & Poth (2016) and Peoples (2020) which included reading and deleting irrelevant information,

determining preliminary meaning units, final meaning units, situated narratives, general narratives, and developing a general description. I used this qualitative case-study approach in order to offer insights into understanding how ten students (aged 17-18) from Valley High School experienced blended learning in post emergency learning. I then developed descriptions of each participant's blended learning experiences at Valley High School to offer insight into the digital landscape that shaped each of their blended learning experience.

Significance of the Study

The COVID-19 pandemic prompted a significant focus on being prepared for uncertainty due to ever-changing health concerns and its impact on educational deliveries (Singh et al., 2021). This exploratory case study holds significance across multiple levels of insight gained from participants' experiences with blended learning. While the data collected from ten participants cannot be generalized to all students or even all students within Valley High School, the detailed accounts offered highlight specific aspects of blended learning design and pedagogy within their school context. Furthermore, participants offered remarkably specific details of blended learning which helps us unpack issues associated with managing multiple digital elements and students' desire for tactile experiences over digital alternatives as well as issues related to digital equity. Particularly, Finding 1 advocated for a 'less is more' approach, while Finding 2 emphasized the importance of balancing digital and tactile activities to supplement rather than replace, both focusing on pedagogical issues of blended learning. Additionally, Finding 3 provided insights on broader discussions of digital equity by uncovering the unevenly distributed blended learning landscape at Valley High School.

At the micro-level, these insights provide an understanding of the challenges faced by students on a day-to-day basis, informing targeted interventions and adjustments to enhance the

blended learning experience within Valley High School. The case study's findings, as a whole, raise important questions regarding the role hands-on or tactile experiences might play in blended learning as it is implemented going forward at this school. This case study yielded another important set of questions regarding blended learning, at the micro-level of Valley High School, related to teachers' capacity to organize and provide students a range of meaningful digital experiences that build on students' digital capital. Additionally, the study uncovered students' feelings of frustration and compassion towards the teachers' capacity limits in delivering meaningful digital experiences. These sets of questions can serve as springboard discussions at the campus and perhaps even district levels regarding the design and pedagogy of blended learning, by centrally focusing on the experiences and digital capital of students.

At the meso-level, findings from this study lend insight into the stories behind the best-practice literature on blended learning. Literature such as Kaur (2013), Jakobsen and Knetemann (2017), and Novak and Tucker (2021) lay out compelling rationales for blended learning approaches, while Barkley (2015), Leo and Puzio (2016), and Gomez-Lanier (2018) offer useful frameworks for implementing blended learning. Data gathered for this study can animate these frameworks, and the findings offer important insight into how students experience blended learning as both promising and problematic. Findings from this case study illustrate that blended learning encompasses a diverse range of experiences for students, which shapes their educational journey in multifaceted ways. Particularly, Finding 1, with its emphasis on adopting a 'less is more' approach, aligns with Kaur (2013) by highlighting the importance of simplified digital assignments and predictable routines. Similarly, Finding 2, which highlights the significance of the balance between digital and tactile activities, resonates with Barkley (2015) and Tsai et al. (2015) in advocating for a diverse blend of learning modalities. These findings advance

literature, such as Picciano et al. (2021), that suggest we listen to student voices to deepen our understanding of the promises and problems of blended learning. The experiences of these participants may guide educators and stakeholders towards necessary steps for achieving digital equity by fostering equitable and meaningful digital learning for all students. Furthermore, this case study's design reminds us that although these data are bound to this educational time and place, findings from this study reach out toward larger discussions of students' experience of blended learning and the ways in which we might make it more equitable.

While perhaps less pronounced in the findings, this study is also significant to more macro-level discussions of digital equity due to its intersections with broader issues related to digital capital and the digital divide in education. Across all findings, the study shines light on the complexities and challenges surrounding students' experiences with blended learning. Particularly, Finding 1 highlights the importance of digital literacy and proficiency, advocating for a consistent simplified approach to technology integration to gain proficiency in digital tools, that builds high yield digital capital. Similarly, Finding 2 reveals disparities in access to digital resources and technologies, emphasizing the need for equitable opportunities for all students to actively use digital tools, that serve as supplements but not replacements of tactile experiences, within blended learning environments. Additionally, Finding 3 emphasizes a 'grass is greener' perception among students which holds significant macro-level insights into digital equity. This perception highlights the existence of a digital use divide, as suggested by the Department of Education (2024), where varying degrees of technology integration create disparities in learning experiences, with some students having access to engaging digital learning experiences that foster creativity and innovation while others do not. Additionally, the finding emphasizes the role of digital capital in shaping student experiences, in which students with higher digital

competencies navigate technology-enhanced learning environments more effectively. This aligns with Ragnedda and Ruiu (2020)'s description of digital capital and its role in self-improvement. Conversely, those with limited digital capital face challenges (Ragnedda & Ruiu, 2020). Students' expressions of disappointment over missed opportunities for digital creativity and engagement in certain classrooms highlight the need for equitable access to high-quality digital learning experiences. The study's findings hold significance in macro level insights in the importance of equitable access to high-quality digital learning experiences and how disparities in digital capital impact students' opportunities for creativity and innovation.

In conclusion, this study significantly contributes to understanding and implementing blended learning more effectively by amplifying student voices across multiple levels of insight. At the micro-level, it offers valuable insights into students' experiences, uncovering challenges and complexities that inform targeted interventions within Valley High School. At the meso-level, the study highlights the complexities of blended learning practices, aligning with existing literature and providing practical implications for educators and policymakers. While participants reported access to technology at Valley High School, disparities in its utilization were revealed across interview data. This gap between stated access and practical usage highlights the complexity of digital equity within blended learning contexts at Valley High School and may provide insights for future research with other populations. Thus, at the macro level, the study contributes to discussions of blended learning and digital equity, emphasizing the need for equitable access to high quality digital learning experiences. This case study's significance lies in its valuable insights into the shifting educational landscape, particularly in blended learning. In essence, this case study highlights the importance of moving beyond surface-level assessments of access and towards a deeper understanding of how technology is

utilized in educational settings. Furthermore, this case study offers insights into how the uncertainty surrounding the effective implementation of blended learning may exacerbate digital equity issues within educational settings. While ensuring access to technology is vital, it alone does not guarantee equitable learning opportunities, as seen within this case study. Overall, this case study provides implications for practice that emphasize a need for simplicity and flexibility to refine instructional practices that effectively use technology as a supplement rather than a replacement for traditional tactile elements, while also ensuring students actively use digital tools that build high yield digital capital.

Definitions of Key Terms

The section briefly outlines the key terms that will be used within the study. These terms include active use, blended learning, computer-mediated components, digital access divide, digital capital, digital design divide, digital divide, digital inequality, digital inequity, digital equity, digital use divide, empowerment, passive use, and post emergency learning. This section gives context on the definitions applied to these terms for the purposes of this case study.

Active Use: The term used within the study, to describe the use of technology to "…think critically, build, produce, communicate, collaborate, and create digital content … includes activities such as coding, immersive simulations, media production, interaction with experts, making global connections, design, and peer collaboration" (U.S. Department of Education, 2024, p. 14).

Blended Learning (BL): The term used within the study is defined by Novak and Tucker (2021) with a post-pandemic update on Stake and Horn (2012) definition of blended learning. According to Novak and Tucker (2021), blended learning is "...the combination of

active, engaged learning online combined with active, engaged learning offline to provide students with more control over the time, place, pace, and path of their learning" (p. 16). Furthermore, the use of terms such as 'active' and 'engaged' further emphasize the role students have in their learning process as they select when, where and how fast they move through their lessons. The study also makes use of Graham (2006) simplified definition of blended learning that describes it as a system that combines "*...face-to-face [F2F] instruction* with *computer-mediated [CM] instruction*" (p. 27).

Computer-Mediated Components: These are instructional components found in a blended learning classroom (Graham, 2006). For the purposes of this case study computer-mediated components will encompass technology used, but not limited to accessing and engaging in learning management systems (LMS), student response systems for assessment, productivity software, digital simulations, platforms for online design, communication, and online game-based learning.

Digital Access Divide: The term used within the study to describe the "inequitable access to connectivity, devices, and digital content" (U.S. Department of Education, 2024).

Digital Capital: The term used within the case study to describe the ability to access information and communication technologies resources and the internalized abilities to use information and communication technologies which are identified as competence, all of which can be converted into benefits of self-improvement across other capitals. According to Ragnedda and Ruiu (2020) digital capital is "… the historical accumulation' of both digital competencies... and digital devices... which in turn enhance the development and application of such knowledge to transform/transfer it to other forms of capital..." (p. 32).

Digital Design Divide: The term used within the case study to describe the “inequitable access to time and support of professional learning for all teachers, educators, and practitioners to build their professional capacity to design learning experiences for all students using edtech” (U.S. Department of Education, 2024).

Digital Divide: The term that has been a subject of discourse for over two decades, appearing across literature with varied definitions and sparking controversy. In more recent literature, Van Dijik (2020) describes it as "the division between people who have access to and use of digital media [information and communication technologies] and those who do not" (p. 1). While Van Dijik's (2020) definition emphasis is on equalities rather than inequities, it serves as a foundational understanding of this term. This case study adopts Van Dijik's (2020) definition while employing a digital equity lens, influenced by literature such as Gorski (2005), Resta et al. (2018), Williems (2019), Moldavan, et al., (2022) and reports from the U.S. Department of Education (2017, 2024). The term used within this case study is recognized as a multifaceted issue, as described by Resta, et. al (2018), consisting of three levels: first level-physical access; second level-uses of ICTs; third level-the positive or negative outcomes from ICT usage or lack of. Furthermore, within the context of education, this case study recognizes that this term is divided into three distinct types, as outlined by the U.S. Department of Education (2024): Digital Access Divide; Digital Design Divide; Digital Use Divide.

Digital Equity: The term used within the case study to describe “... a fair distribution of resources based on needs, but also encompasses not only access and distribution to equipment and the internet, but also unbiased and uncensored content... it also relates to having awareness, skills and knowledge to be able to fully utilise these for educational purposes” (Williems, 2019, p. 152)

Digital Inequality: The term used within the case study to describe the gap in providing everyone physical access to information and communication technology (ICT). According to Williems (2019), the term equality refers "...to the notion of sameness; in this, the provision that fairness and justice are achieved by giving everyone the same" (p. 152). However, digital inequalities don't address the lack of everyone commencing at the same starting point resulting in unfair distribution of digital resources (Williems, 2019).

Digital Inequity: The term used within the case study to describe a gap in opportunities "...to use the technologies in ways that empower people to participate more fully and equitably in society (Gorski, 2009, p. 352). According to Williems (2019), the term inequity "...acknowledges the various needs of individuals, thereby acknowledging the unevenness of the playing field" (p. 152). Thus, the use of digital inequities addresses the unfairness in the distribution of digital resources based on the prior existing discrepancies across various populations.

Digital Use Divide: The term used within the case study to describe the "inequitable implementation of instructional tasks supported by technology. On one side of this divide are students who are asked to actively use technology in their learning to analyze, build, produce, and create using digital tools, and, on the other, students encountering instructional tasks where they are asked to use technology for passive assignment completion" (U.S. Department of Education, 2024).

Empowerment: The term used within the case study to describe the ability, capacity, and/or skills gained to give greater voice and/or power to make decisions about education as agents of change and/or to self-improve (capital).

Passive Use: The term used within this case study to describe the use of technology to passively complete assignments such as "…activities such as filling out digital worksheets or consuming digital content without accompanying reflection, imagination, or participation" (U.S. Department of Education, 2024, p. 13).

Post Emergency Learning: The educational community coined the abrupt shift towards online learning (eLearning) due to COVID-19 pandemic as emergency remote teaching (Hodges, et al. 2020; Sosa Díaz, 2021), also known as emergency learning, to distinguish it from planned online education. Thus, post emergency learning refers to the learning environment that emerged from the aftermath of COVID-19 pandemic, which includes educational practices experienced after emergency teaching/learning.

CHAPTER II

REVIEW OF LITERATURE

Recent literature suggests that a greater focus should be placed on preparing for uncertainty through flexible learning spaces due to the ever-changing health concerns revolving around the COVID pandemic and its impacts on a growing educational crisis (Singh et al., 2021, Novak & Tucker, 2021). The pandemic has prompted educators to consider serious curricular and pedagogical questions about inequitable learning experiences both before and during COVID-19 learning (Novak & Tucker, 2021). This case study focused on sharing the stories told by students' blended learning experiences using digital equity as its theoretical framework. Towards these ends, the chapter begins with a historical overview of literature surrounding Blended Learning. Next, the chapter provides a historical overview of digital divide literature, along with paradigm shifts towards digital equity. Following this, the chapter explores literature focused on conceptualizing the term digital capital and its influence on the digital divide. Then, the chapter explores K-12 education literature that addresses the complex interplay between students' access to digital resources, their digital competencies, and the socio-economic factors that may shape their digital experiences. Lastly, the chapter concludes with discussing the theoretical underpinnings that guided this case study, particularly the interconnectedness found between blended learning, the digital divide, digital equity, and digital capital.

Blended Learning

This section discusses literature surrounding Blended Learning (BL) in historical order. Towards these ends, this section first addresses the historical trajectory of Blended Learning definitions found across its evolutionary expansion in literature (Garrison & Kanuka, 2004; Graham, 2006; Staker, 2011; Güzer & Caner, 2014; Picciano, et al., 2021). The section then focuses on identifying various instructional models that are encompassed within the umbrella of Blended Learning (Staker & Horn, 2012). The section is then followed by a historical overview of Blended Learning research studies with diverged focuses on student perspectives and treatment effects, which compare traditional classrooms and blended learning classrooms to test effectiveness (Barkley, 2015; Tsai et al., 2015; Zafar, 2016; Leo & Puzio, 2016; Gomez-Lanier, 2018). Lastly, I walk the reader across post-pandemic literature on Blended Learning with the intent to address gaps in the literature calling on further research areas of need.

While information and communication technologies (ICTs) and innovation have continued to expand across early and recent literature surrounding blended learning, literature agrees on the presence of ambiguous definitions for BL (Garrison & Kanuka, 2004; Graham, 2006; Staker, 2011; Güzer & Caner, 2014; Picciano, et al., 2021). Sharma (2010) cautioned the use of the buzzword known as blended learning (BL) that had been used for a decade, at the time, in which its meaning had expanded vastly. Similarly, the in-depth analysis of blended learning literature, provided by Güzer and Caner (2014) noted the evolutionary expansion of BL across a twelve-year period. According to Güzer and Caner (2014), early literature can be dated back to Cooney's (2000) first use of the term 'blended learning' to describe the mixture of play and work activities within prekindergarten. While Güzer and Caner (2014) further provided various other studies that were identified as 'first attempts' of blended learning which

incorporated a degree of online learning, it was stated that all the studies lacked the ability to define BL. According to Güzer and Caner (2014), the 'Definition Period' gave rise to a multitude of definitions for Blended Learning, across the work of Garrison and Kanuka (2004), Graham (2006), and many others. Garrison and Kanuka (2004) defined blended learning as the "...thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (p. 97). Furthermore, Oliver and Trigwell (2005) suggested that the definitions used to describe the term, at the time, were incoherent or redundant, lacking clarity. Subsequently, Graham (2006) provided discourse across the common themes surrounding the ambiguous definitions used to describe the buzzword known as blended learning. According to Graham (2006), definitions that used descriptors as "combining instructional modalities" or "combining instructional methods" may have resulted in ambiguous definitions of blended learning (p. 3). Graham (2006) warned against ambiguous definitions of blended learning since they may result in a broad spectrum, that essentially all learning systems may fit such a definition. Graham (2006) suggested that a more accurate definition to blended learning was a system that combines "*...face-to-face [F2F] instruction* with *computer-mediated [CM] instruction*" (p. 27). Similarly, Delialioglu and Yildirim (2008) described blended learning as the strategic incorporation of new technologies into academic courses. Later, Staker and Horn (2012) provided a more detailed and annotated view of their revised definition of blended learning (BL) as:

> …a *formal education program* in which a student learns at least in part through *online delivery of content and instruction* with some element of student control over time, place, path, and/or pace…and…at least in part at a *supervised brick-and-mortar location away from home* (p. 4)

Later, Picciano, et al. (2021) provides a more simplified yet flexible definition for blended learning as "...the strategic combination of *online* and *in-person learning*" (p. 12). However, Novak and Tucker (2021) provide a more recent (post-pandemic) adaptation of Staker and Horn's (2012) definition, which is later discussed in this section within post-pandemic literature.

Umbrella of Blended Learning's Instructional Models

While the definitions shared by Graham (2006), Staker and Horn (2012), and Picciano, et al. (2021) vary in the year of development and specificity, they all share similar descriptors. The use of descriptors such as *face-to-face instruction, brick-and-mortar location away from home,* and i*n-person learning* may be used interchangeably. Similarly, the use of descriptors such as *computer-mediated instruction, online delivery of content and instruction,* and *online learning* may be interchangeable to some degree as well. Thus, while these common descriptors may be interchangeable it is crucial to note the commonality found across these definitions which is the *blend* between *online and in-person learning*. Additionally, Graham (2006) described four levels of blending in which the nature of the blend varies between the levels: activity, course, program and institutional. The activity level of blending is when individual learning activities make use of both F2F and CM instruction. The course level of blending is when the course is designed to consist of a combination of both F2F and CM instruction. While both activity and course level blending are often design driven by instructors, both program and institutional levels of blending are driven by administrative reasons such as cost or accessibility which was experienced by the COVID-19 pandemic's impact on education.

Furthermore, instructional models provided detailed descriptions of each type of blend based on the varying degree of the blended component. Staker and Horn (2012) identified four major instructional models (Figure 2) within the broad umbrella of Blended Learning.

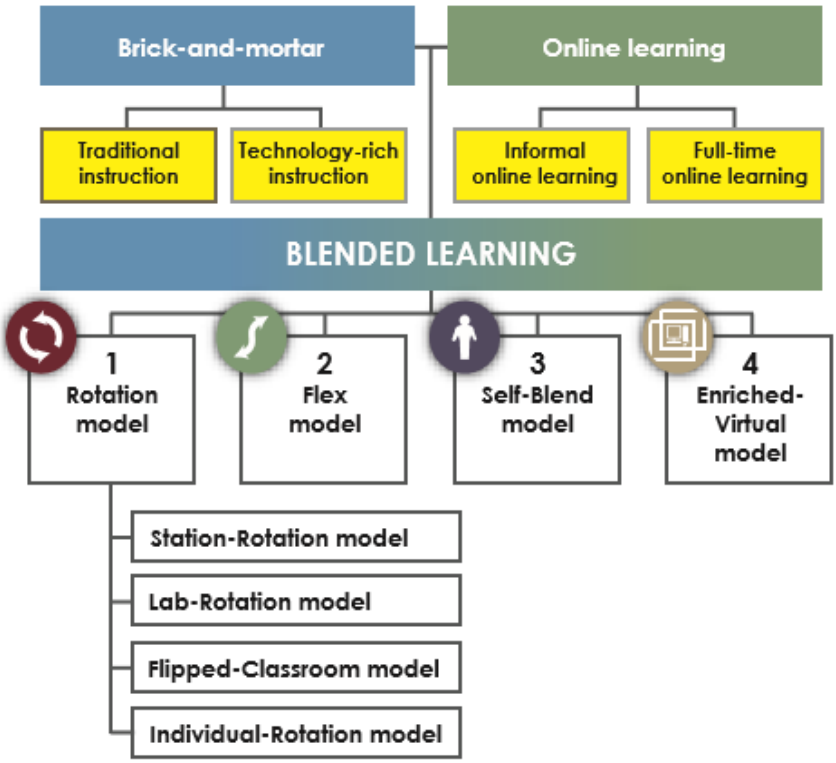


Figure 2: Instructional Models within Blended Learning. *Note.* From Classifying K-12 Blended Learning, by Staker and Horn, 2012, p. 3. Copyright 2012 by Innosight Institution, Inc.

As noted, in Figure 2, the first instructional model within Blended Learning, is the Rotation model due to its primary descriptor of students rotating on a fixed schedule between face-to-face and online learning (Staker & Horn, 2012). This instructional model differs from the others in which it has four subcategorized models, that share the same primary descriptor of rotating on a fixed schedule while also consisting of individual unique descriptors. Furthermore, flipped classroom model differs from other rotation models in which it allows the "...student control over time, place, path, and/or pace…" they obtain content and instruction via online while experiencing "...teacher guided practice...on campus during the standard school day" (Stake & Horn, 2012, p. 10). On the other hand, the flex model as described by Stake and Horn (2012) primarily delivers instruction and content via online while students are in person supervised and supported by teachers in small groups when needed. Similarly, the self-blend model positions

students in-person, it differs in those students elect to take individual courses online while taking other courses on campus with in-person teachers (Stake & Horn, 2012). The last instructional model found within blended learning is identified as the Enriched-Virtual model, in which students receive a whole-school experience both remotely and in-person but not necessarily everyday (Stake & Horn, 2012). Similarly, Graham, et al. (2019) shares a spectrum of blended learning seen across K-12 classrooms that incorporate Rotation Models, Flex and Enriched Virtual. These vary based on the four dimensions of interaction: Space, Time, Fidelity, and Humanness (Graham, 2006). Additionally, Novak and Tucker (2021) illustrate the variations to Rotation Models in K-12 settings: whole group moves as a unit between online and offline learning; stations are used to rotate students between online and offline learning; flipped classroom places lecture-based instruction at home through online learning and offline learning during class time; students progress at their own pace through a playlist of both online and offline learning activities. According to Kaur (2013), blended learning may pose several challenges primarily within three major areas: technical, organizational, and instructional design (Kaur, 2013). However, literature has also noted that blended learning poses various benefits such as shifting from passive to active learning, offering flexibility and accessibility to instructional content, and provides individualized and relevant content (Kaur, 2013; Novak & Tucker, 2021).

Research Studies on Blended Learning

According to Güzer and Caner (2014) there is a significant amount of literature within the 'Popularity Period' focused on the effectiveness of blended learning. Guy and Marquis (2016) refer to a similar goal-oriented ongoing debate within the educational community in identifying the most effective method to "…meet the demands of the 21st century student with learning

environments that are student centered, self-directed, technology enhanced, and flexible" (p. 1). According to Güzer and Caner (2014), the 'Popularity Period' gave rise to simultaneously diverging research studies focused on participant perceptions and those focused on effectiveness. Similarly, recent literature focused on the flipped classroom model found within the rotation model of blended learning, which illustrated a split between research focuses (Barkley, 2015; Tsai et al., 2015; Zafar, 2016; Leo & Puzio, 2016; Gomez-Lanier, 2018).

Barkley (2015) conducted a mixed methods research study at the College of Agriculture at Kansas State University from 2001 to 2012. The study focused on blended learning as a treatment effect, which meant comparing it to traditional classrooms, in order to test the effectiveness of blended learning classrooms. The study specifically tested the effectiveness of the flipped classroom model in fostering an environment that enhances student learning. The study consisted of both quantitative and qualitative data, which was collected via surveys and focus groups. Barkley (2015) focused on determining if the flipped classroom model had a positive impact on student retention and grade distribution. According to Barkley (2015), flipped classroom fosters an environment for enhanced student learning by using "…active learning…student engagement…hybrid course design and…course podcasting" (p. 240). The study highlights the presence of an adjustment period for the instructor and students at the beginning of the flipped classroom course, due to the high expectations required. The study also depicts an increase in student engagement and course satisfaction among students enrolled in the flipped classroom course. Furthermore, flipped classroom had 100% passing rate unlike the traditional lecture-based course which had a 75% passing rate. An increase of content mastery was also noted by Barkley (2015) among students enrolled in the flipped classroom course when compared to those in a traditional lecture-based course. Barkley (2015) suggested that the use of

the flipped classroom model may increase content retention "… since pass rates are higher, engagement is greater, and teachers can spend individualized attention on at-risk students and students who need motivation or academic skills" (p. 243).

Similarly, another mixed methods research study was conducted by Tsai et al., (2015) The study also focused on blended learning as a treatment effect, by comparing flipped classrooms that used problem-based learning (FPBL) to traditional classrooms that used problem-based learning (PBL). The study's primary focus was to determine the effectiveness of flipped classroom model, that used problem-based learning (FPBL), in increasing student performance. Student performance was measured using a rubric evaluating the Ebook designs of six-grade students. The study then conducted interviews with both students and teachers to identify the effects the flipped classroom model with PBL had on student performance. The study analyzed the data using a sample t-test to determine the effects FPBL had on student performance scores. The results showed a higher average score among the FPBL group when compared to the PBL group. The study explains that this could be due to a combination of the students' unfamiliarity with PBL alone and time constraints which may have led to confusion among students. In comparison to FPBL, which increased class time availability to be used to reduce confusion by taking lecture time out of the class and assigning it as homework instead. Thus, the study illustrated "…that flipped classroom could lead to better development of students' computing skills in designing Ebook" (Tsai et al., 2015, p. 36).

Contrastingly, another mixed methods research study was conducted by Zafar (2016) with the primary focus on perspectives rather than blended learning placed as a treatment effect to test its effectiveness. According to Zafar (2016), it focused on determining the "…attitude of the undergraduate medical students towards a recently implemented flipped class and to identify

the context in which it worked best" (p. 795). The study collected quantitative data regarding student perspectives via surveys at the end of the 5 class sessions. Overall, the study found that 84.5% of the students liked the flipped classroom model and 74.6% of students wanted to replace traditional lectures with the flipped classroom model. While the study found that student-teacher interaction was greater in flipped classroom settings, "it is by no means universally accepted by students" (Zafar, 2016, p. 796). According to Zafar (2016), some factors like organizational problems contributed to student dissatisfaction due to class size. One of the common themes focused on organizational factors in which a sub-theme stated that one teacher to handle all group discussions was not enough. Another sub-theme was due to distractions emanating from noise levels in the classroom. Also, the lack of effective group discussions due to unprepared students was stated as another sub-theme. Thus, the study also provided practicing educators and future researchers with potential challenges that should be addressed to better implement the flipped classroom model. Based on the survey results, qualitative data was collected from students that were unhappy with the method. These students were asked to participate in group interviews to help determine possible factors that may have caused challenges or negative perspectives to arise from the flipped classroom model.

On the other hand, Guy and Marquis (2016) conducted a quasi-experiment placing blended learning once again as a treatment effect, when compared to traditional classrooms. This was done to test blended learning's effectiveness as the primary focus of the study. The research study focused on conducting a comparison between student performance among two different instructional models: the traditional vs. the flipped classroom model. The study was conducted by the same instructor for both instructional models at the College of Business at Tennessee State University. The traditional classroom setting consisted of chapter readings and

assignments conducted at home and PowerPoint lectures conducted in the classroom. The flipped classroom setting, on the other hand, consisted of video lectures and podcasts at home, and active learning was seen in the classroom. The final grade for both traditional and flipped course sections was then averaged by the four major forms of assessment: activities/projects, quizzes, mid-term, and final. At the end of the course, students were also given an online survey to complete regarding their satisfaction with the course based on the instructional method used. According to Guy and Marquis's (2016) statistical analysis there was a correlation between performance and the instructional method used. Furthermore, the online survey results illustrated a higher level of student commitment and satisfaction among flipped classroom students in comparison to traditional (Guy & Marquis, 2016).

Similarly, Leo and Puzio (2016) also conducted a quasi-experiment whose primary focus was placed on the effectiveness of blended learning when viewed as a treatment effect in its comparison to traditional classrooms. The study used four sections of 9th grade Biology to determine the effect that the flipped classroom model had on academic achievement. Two high-achieving sections were randomly assigned a condition: flipped instruction or traditional (direct instruction). The same was done for the low-achieving sections. Leo and Puzio (2016) explained that the flipped classroom model provides educators the opportunity to "…disseminate high-quality scientific information while providing a space for students to grapple with complex concepts and negotiate meaning" (p. 780). The instructor developed video lectures which were uploaded to YouTube. Then, the instructor used Moodle to administer virtual quizzes for sections assigned to the flipped classroom model. Leo and Puzio (2016) suggests that with the flipped classroom model, students are given the opportunity to move at their own pace when reviewing class lectures and review as many times as necessary or search for outside sources

when necessary. Overall, the study found that students in the flipped biology classroom outperformed those in the traditional classroom. Additionally, the study emphasized that the flipped classroom model "…with additional active learning does show promise to support student achievement and interest in science" (Leo & Puzio, 2016, p. 780). According to Leo and Puzio (2016), this instructional method was noted to increase teacher-student interaction, collaboration, and engagement and allowed a greater sense of differentiation in student learning.

More recently, Gomez-Lanier (2018) conducted a mixed methods case study in which data was collected via online surveys, which consisted of both quantitative and qualitative data, focused on effectiveness and student perspectives. The study's first research question focused on determining whether student collaboration found in a flipped classroom would affect student motivation and learning outcomes. The second research question focused on determining whether student collaboration in a flipped classroom promotes a greater sense of meaningful learning than that of a traditional classroom. Participants consisted of student volunteers that were enrolled in either Food and Nutrition or Interior Design History courses. Participants were given an online pre-survey at the beginning of the academic semester. Students then experienced traditional classroom environments the first half of the semester and then flipped classroom environments the second half of the semester in the participating enrolled course. The traditional classroom environment consisted mainly of lectures and assignment deadlines based on PowerPoint presentations, homework assignments, and in-class tests. As for the flipped classroom environment experienced in which they were assigned to view instructor PowerPoints, watch YouTube videos and readings from textbooks, selected their own teammates and participated in many student group discussions. According to Gomez-Lanier (2018), students participated in-class "…discussions, group problem-solving exercises, informal class

presentations and instructor feedback" (p. 3). Overall students prepared for these in-class discussions and presentations by reviewing lectures at home prior to class. Upon completion of the academic semester, the participants completed an online post-survey. The quantitative data obtained from questions 3-19 were analyzed statistically to address the first research question. The results illustrated that there was a significant student inclination towards a flipped classroom due to a variety of class activities and productive use of class time. The second research question was addressed by questions 9-19, which illustrated a significant difference in student collaboration. Overall, the study found a positive increase in student perception of collaborative learning in a flipped classroom (Gomez-Lanier, 2018). However, it also noted that peer instruction and collaboration were seen as negative aspects of their learning process. According to Gomez-Lanier (2018), some students expressed that content was not discussed in-depth as it would with the instructor guiding the lesson. Overall, the study provided insight into the challenges and negative perceptions noted by students further shining gaps in research area needs across blended learning.

While early literature (Barkley, 2015; Tsai et al., 2015; Zafar, 2016; Leo & Puzio, 2016; Gomez-Lanier, 2018) on blended learning has increasingly gained momentum in the educational research community, ranging from elementary to higher ed among numerous subjects, it has also shown a split focus between perspectives and placing it as a treatment effect when compared to traditional classrooms. Overall, the literature has provided insight into potential indicators of empowerment or disempowerment experienced from blended learning, prior to the educational crisis sparked by COVID-19 pandemic (U.S. Department of Education, 2017). For instance, Gomez-Lanier (2018) suggests that the flipped classroom method will further aid the development of critical thinking, self-directed learning, and gaining numerous opportunities to

apply and practice content-based skills. On the other hand, studies have shown that a lack of structure for flipped classrooms may cause students to have a negative attitude toward flipped classrooms (Jakobsen & Knetemann, 2017). According to Jakobsen and Knetemann (2017), flipped classrooms should be structured to ensure time spent in-class is actively and productively used. However, the question regarding how to structure these in-class activities is often not answered in the literature (Jakobsen & Knetemann, 2017). Furthermore, literature (Zafar, 2016; Gomez-Lanier, 2018) suggests that various challenges may arise in the use of the flipped classroom model which may negatively impact its potential benefits. Not all students may put in the same effort or motivation, resulting in slow overall team progress and success (Gomez-Lanier, 2018). However, Gomez-Lanier (2018) suggests that unequal work completion or contribution among team members known as 'the free-rider problem', can be addressed using frequent peer evaluations among group members. While in some instances, peer accountability may become evident, resulting in students becoming motivated to provide the necessary tools from prior content obtained from 'outside of class' assignments, others may lack it thereof directly impacting the overall group's progress and success (Gomez-Lanier, 2018). Furthermore, many students may also develop negative feelings towards the flipped classroom model due to greater workloads outside of the class in preparation for class activities (Zafar, 2016; Gomez-Lanier, 2018). Gomez-Lanier (2018) suggests that students may not read or view the assigned content outside of the class due to the expectation that the teacher must explain all the content during class, further resulting in frustration because students felt the instruction was being done by their peers rather than their instructor. Overall, early literature (Barkley, 2015; Tsai et al., 2015; Zafar, 2016; Leo & Puzio, 2016; Gomez-Lanier, 2018) provides insight on the

opportunities to use a multitude of engagement and discovery experiences, within the same learning environment through blended learning models of instruction.

Post-Pandemic Literature

Recent educational technology literature (Bergdahl & Bond, 2022; Picciano et al., 2021; Novak & Tucker, 2021) illustrates blended learning (BL) benefits, barriers, and shifts during the educational crisis that were sparked by the COVID-19 pandemic. According to Fisher et al. (2021), prior to the pandemic, blended learning "... was generally understood to mean that students had some control over the time, place, path, or pace of their learning... using technology as a tool to help drive their own learning" (p. 4). Stake and Horn (2012) established the four major instructional models within the blended learning umbrella prior to the pandemic. Fisher et al. (2021) challenged that notion by suggesting that the experience many K-12 educators had during the pandemic when combining teaching both distance learning and face-to-face students at the same time, should not be confused with Blended learning. However, a strong resemblance in key descriptors of blended learning's flex model exists between Fisher et al. (2021) definition of 'Simultaneous Learning', a new instructional model separated from BL. According to Picciano, et al. (2021), blended learning is an umbrella term that is methodologically agnostic which may result in a multitude of instructional models that may "...blend using constructivist, cognitivist, or behaviorist methods" (p. 12). Thus, using a constructivist lens to view Stake and Horn (2012) definition, Novak and Tucker (2021) provide an updated definition for blended learning as:

> ...the combination of active, engaged learning online combined with active, engaged learning offline to provide students with more control over the time, place, pace, and path of their learning (p. 16)

Novak and Tucker's (2021) adaptation to Stake and Horn's (2012) definition for BL emphasizes students' active role in their learning process. The use of terms such as 'active' and 'engaged' further emphasize the role students have in their learning process as they select when, where and how fast they move through their lessons. Thus, the post-pandemic definition provided by Novak and Tucker (2021) will be used in this study to define blended learning.

Furthermore, Novak and Tucker (2021) suggest that the post-pandemic educational crisis calls for "...a new vision for teaching and learning", in which blended learning provides the opportunity for student-centered and flexible learning, collaboration, growth, creativity, and drive (p. 23). Novak and Tucker (2021) reiterate that blended learning's instructional models umbrella encompasses a wide spectrum. The spectrum ranges from one end having the primary driver as the teacher in the classroom to the other end as relying on online instruction and periodic check-ins with the teacher (Novak and Tucker, 2021). Similarly described by Stake and Horn (2012), Novak and Tucker (2021) reiterate a variety of instructional models that continue to exist within Blended Learning. Additionally, Novak and Tucker (2021) suggest that rotation models are more heavily used by most schools due to their flexibility across learning landscapes which they state is a necessity in post-pandemic instructional models. Novak and Tucker (2021) recount the dramatic shift in the learning landscape caused early on in pandemic due to emergency remote teaching. According to Novak and Tucker (2021), "...schools that had not invested heavily in technology or professional learning focused on blended and online learning, this state of paralysis extended into summer" (p. 60). This further shined a light on digital inequities across schools. While literature identified both positive and negative perspectives of blended learning, Novak and Tucker (2021) also identified the various disparities that became

evident during online learning across student populations. According to Novak and Tucker (2021),

> ... equity issues extend beyond digital access... they demand our attention if we expect students to navigate flexible learning landscapes... students need access to academically rigorous, mentally stimulating, and differentiated learning opportunities provided by trained teachers who know how to leverage the benefits of both online and offline learning to provide students with a high-quality educational experience regardless of the learning landscape (p. 61).

Novak and Tucker (2021) also suggest that BL provides variability and personalized learning opportunities so that students can reach their academic potential. While teacher-led whole group instruction has been a traditional instructional model used for decades, it lacks flexibility for teacher-learner partnerships to develop more profoundly (Novak & Tucker, 2021). On the other hand, BL provides a much more flexible classroom atmosphere allowing for one-to-one conferencing, small group opportunities, and whole group, ultimately building on stronger teacher-learner partnerships (Novak & Tucker, 2021). For example, the use of videos in blended learning may "... replace whole-group instruction if the entire class needs to hear the same foundational explanation or see the same model... its advantageous for [students]… to have more control over the experience" (Novak & Tucker, 2021, p. 98). This shift in time and place of whole group instruction opens endless possibilities for flexible uses of the instructional class time. Novak and Tucker (2021) suggest that blended learning provides a flexible environment that may be used to foster mastery-oriented feedback, a community of inquiry, expert learners, and strong teacher-learner partnerships, as coaches and learning partners. Furthermore, Novak and Tucker (2021) state that a shift in control is essential for Blended Learning to help develop

expert learners. The shift from teacher to learner "...requires that students develop the skills necessary to share the responsibility for their learning... [by] creating opportunities for students to learn who they are as learners so they can transfer their skills to the goals that are most important to them" (Novak & Tucker, 2021, p. 137). Educators take on the role of coaches for students to build metacognitive skills throughout three components of each instructional activity: before, during, and after. The notion of student empowerment is subtly described within Novak and Tucker's (2021) updated definition on blended learning, by illustrating the active role students have in their learning process. While the physical layers such as modality and media may be used to describe the differences between instructional model blends, Picciano, et al. (2021) suggests that the pedagogical layers should also be considered.

According to Picciano, et al. (2021), "...the quality of the learning will depend more on the details of the model and its implementation than on the modality alone" (p. 13). Interestingly, this was considered in a qualitative research study conducted post emergency learning and led by Bergdahl and Bond (2022). The study noted "... that the intention of active learning does not automatically translate to active learning for all students" (Bergdahl & Bond, 2022, p. 2635). The study focused on how digital technologies in blended learning environments impacted the educational context which influenced student engagement and/or disengagement. The study consisted of 14 classroom observations across various elementary classrooms. According to Bergdahl and Bond (2022), the study's findings illustrated that various factors influence student engagement in blended learning such as "...conditions for teaching and learning, and leadership execution, the learning activities and students' beliefs of belonging and individual challenges" (p. 2653). This further aligns with considering the pedagogical layer suggested by Picciano, et al. (2021). Similarly, a mixed method research study was conducted

post emergency learning, focused on whether blended learning promoted learner-centered pedagogy in elementary math classrooms (Zahedi, et al., 2023). The study consisted of two groups: control and treatment. The treatment group engaged in a station-rotation blended learning model, which used an online adaptive digital content platform that provided immediate feedback to students. According to Zahedi, et al. (2023), "...students in the treatment group would experience more learner-centered... differentiated instruction, precise and timely feedback, and student engagement." The study found that the treatment group experienced more learner-centered and student-teacher interactions because of the adaptive digital content platform. Zahedi, et al. (2023) suggested that the immediate feedback of checkpoints to students allowed for class time to be used for such experiences as opposed to the control group whose feedback took longer since it was graded traditionally by the teacher. Additionally, a study conducted by Nong, et. al (2023), post emergency learning investigated the relationship academic self-efficacy, learning engagement, cognitive load, and enhancement of academic self-confidence (EASC) in the context of blended flipped learning. The findings suggested that academic self-efficacy plays a crucial role in student engagement and cognitive load management within blended learning environments. The study shows that learning engagement positively impacts the enhancement of academic self-confidence, indicating that active participation in blended learning contributes to students' confidence in their academic abilities. Conversely, cognitive load negatively impacts the enhancement of academic self-confidence, implying that excessive cognitive information may hinder students' confidence in their learning abilities. Thus, Novak and Tucker's (2021) emphasis on the active and engaged learning component of both online and offline provides great insights on student empowerment using a constructivist lens while ensuring both the physical and pedagogical layers are considered within blended learning.

According to Picciano, et al. (2021), blended learning research is two decades old, and has often placed BL as a treatment effect to test its effectiveness when compared to other instructional models. According to Guy and Marquis (2016), educational researchers are "actively debating whether students in the traditional lecture-based environment perform equal to or better than students in the flipped classroom" (p. 2). However, Picciano, et al. (2021) urges against this research focus because it "...may risk focusing on surface-level features of the blended design rather than on its core pedagogical features" (p. 13). This type of research typically focuses on modality only which lacks enough consideration of the impact pedagogical layers may have on student learning. Furthermore, Picciano, et al. (2021) details four major areas of research that have focused on blended learning: instructional design issues, institutional issues, student issues, and faculty issues. The literature provided by Picciano, et al. (2021) regarding each of the four major areas of focus ranged from case studies to quasi-experimental to mixed methods. While student perspectives were commonly sought out among various research studies provided by Picciano, et al. (2021), they were often paired as an additional focus to academic success and/or persistence. Similarly, Oliver and Trigwell (2005) urged that future research be focused on "...an in-depth analysis of the variation in the experience of the learning of the student in the blended learning context" (p. 24) rather than its primary drive to test effectiveness. Overall, blended learning research provides insights into possible gaps in literature, primarily to give voice to digital inequities across student experiences.

Thus, this case study focuses on the stories told across students' blended learning experiences. By centering this case study within the theoretical framework of digital equity, I aimed at uncovering potential disparities that may exist among students as I explored students' blended learning experiences. Digital equity offers a lens through which to examine the

equitable distribution of digital resources, competencies, and opportunities. This provides insights into the empowerment or disempowerment dynamics at play in blended learning environments. Therefore, this case study aimed at contributing to broader issues related to blended learning by amplifying student voices so that we may move towards a more inclusive and equitable educational landscape.

From Digital Divide towards Digital Equity

This section discusses literature on the term 'digital divide' and sets a foundation for understanding literature surrounding the digital divide from a digital equity lens. By adopting a digital equity lens, this study aimed at exploring the complex interplay between students' access to digital resources, their digital competencies, and the socio-economic factors that may have shaped their digital experiences. Towards these ends, this section begins with a literary walkthrough across earlier literature by NTIA (1995, 1999), Light (2001) and Selwyn (2004). Next, I offer an overview of Compaine's (2001) harsh critique on the media driven concept of the digital divide, and its later critique by Murdock (2002) on its misinterpretations of the NTIA reported data. Then the section discusses Gorski's (2005) call for a shift from 'inequality' to 'inequity' in the 'access' paradigm. Lastly, I walk the reader across recent literature on the digital divide calling for digital equity (U.S. Department of Education, 2017, 2024; Resta, 2018; Moldavan, et al., 2022).

Early Literature

Early literature on the digital divide shows a shift in focus regarding a notion of 'inequality' of access to information and communication technologies ranging from digital television, telephones, computers, to the internet, (NTIA, 1995, 1999; Light, 2001; Servon,

2002). According to Servon (2002), the term known as the 'digital divide' began to gain more attention during the mid-1990s after the release of the Falling through the Net series by the US Department of Commerce National Telecommunications and Information Administration (NTIA). The NTIA (1995) report consisted of a closer look at data collected regarding access to information and communication technologies. According to NTIA (1995), "...information 'have nots' are disproportionately found in this country's rural areas and its central cities." The report established a gap found between the information 'haves' and 'have nots' with regards to accessing information and communication technologies (telephone, computer, and modem). It also called for more assessment research to be conducted regarding the considerations of the 'have nots.' NTIA (1999) released another report in their Falling through the Net series, in which the term digital divide came to light publicly. Light (2001) suggests that the NTIA report's publicity contributed to the use and definitions of the digital divide. According to NTIA (1999), the term digital divide is used in reference to "...the divide between those with access to new technologies and those without." The NTIA (1999) defines the digital divide with a singular focus based on 'inequality' across ICT access. It is no surprise that the NTIA's definition would be framed with a notion of 'inequality' of physical access based on its continued usage of terms that place emphasis on physical access, such as information 'have' and 'have nots.' Light (2001) describes the concept of the digital divide as "...an artfully constructed public problem, only one way among many to frame and to measure inequality in the information society" (p. 711). The description given by Light (2001) resembles notions of inequality and information society provided in the NTIA report's framework. According to Selwyn (2004), literature has oversimplified the digital divide by drawing from 'dichotomous' perspectives relying on sharp opposition between over-simplified constructions of "the haves vs have-nots." Furthermore, the

NTIA reports' term usage of information 'have nots' may have been a driving force in early framework used to conceptualize the digital divide by the notions of 'inequality' across access to information and communication technologies among early literature as recounted by Selwyn (2004). Selwyn (2004) called for a reconceptualization of the digital divide by stakeholders and qualitative researchers regarding "... the range of inequalities that currently exist in ICT-based opportunities, uptake, engagement, and outcomes" (p. 357). Selwyn's (2004) reconceptualization of the digital divide aimed to provide a more complex understanding of what constitutes the digital divide. However, it was still framed with the notion of 'inequality' across ICT access.

Critique of the Digital Divide

In contrast, Compaine (2001) offered a harsh critique regarding any data that may suggest the presence of the digital divide, based on the notion that it is "...less a crisis than a temporary and normal process" (p. 326). Compaine (2001) argued that the digital divide was a problem of the past, in which early stages of new technology releases had smaller consumer populations due to prices per unit. Furthermore, Compaine (2001) claimed that eventually, the gaps will continue to resolve themselves as increases in physical accessibility to information and communication technologies are witnessed due to decreases in prices. According to Compaine (2001), "...any 'gap' is moderate...poorer school districts would tend to have fewer new books... the problem, if any, is not a computer hardware one" (p. 113). The quote suggests that if there is any information or knowledge gaps it is not because of the 'digital divide' but rather due to economic decisions regarding necessities. Compaine (2001) further made use of the term 'voluntary non-users' to suggest that any gaps that do still exist when cost is excluded is due to individuals that do not want access to information and communication technologies. Compaine's

edited collection seemed to suggest that gaps present would continue to close on their own due to declining costs resulting in increases in accessibility to those that want it.

However, Murdock (2002) was quick to shine a light on certain flaws in Compaine's (2001) argument. Murdock (2002) warned that Compaine's (2001) use of the NTIA reports, and other surveys should not be taken at face value. Murdock (2002) further suggested a hidden agenda found in Compaine's (2001) edited collection which they see as aimed at exposing the digital divide as a politically motivated myth. He further argued that the use of the NTIA report from the Falling Through the Net series poses greater challenges in Compaine's (2001) conclusion rather than advancing it. The conclusion of the NTIA (1999) report states "...despite these patterns of growth, the information "haves" have dramatically outpaced the information "have nots" in their access to electronic services. As a result, the gap between these groups -- the digital divide -- has grown over time." While informational technology was increasing, the report established that the digital divide was still evident. The report also warned that the gap was increasing across households based on race, education, and income level. Thus, Murdock (2002) provided an adequate challenge to Compaine's (2001) conclusion. Contrary to Compaine's (2001) claim, Murdock (2002) suggested that the report illustrated distinguishable inequalities in which "...among some groups are widening rather than closing" (Murdock, 2002, p. 387). Thus, Compaine's (2001) use of NTIA reports were not fully aligned with his claims that the digital divide war was won, rather the reports challenged it and sparked further debate.

Similarly, this continued debate concerning the alleged "disappearance" of whether the digital divide was taken up by Martin's (2003) reassessing 2002 U.S. Department of Commerce data. Martin (2003) noted that all income levels showed an increase in computer ownership and internet usage, with a more pronounced increase among the higher income levels. Similarly, to

Compaine's (2001) predictions, Martin (2003) suggested that data trends may predict a future outcome in which "... internet use and computer ownership will continue to spread among all income groups...become nearly universal...." (p.8-10). However, unlike Compaine's (2001) argument, Martin (2003) addressed a growing problem, which was termed as 'lag time' in reference to the amount of time needed for disadvantaged groups to catch up to advantaged groups due to the presence of inequalities across groups. Martin (2003) provided various scenarios, to help us see how lag time may have long-term effects on society based on technological inequalities, further suggesting that we work towards decreasing lag time as much as possible. While Martin (2003) addressed the technological inequalities between advantage and disadvantage groups, Compaine (2001) dismissed them. According to Compaine (2001), disadvantaged groups such as "...poorer schools, having been later to the game, are benefiting from lower costs for equipment and the improved performance of PCs compared to those that would have been purchased by the 'cutting-edge' schools at higher prices a few years earlier" (p. 330). This contradictory claim illustrates that disadvantaged groups were at an advantage over groups that had earlier and longer access to Information and communication technologies, which further illustrates flaws in Compaine's (2001) argument.

A look at the NTIA's Digital Nation Data Explorer, illustrates an increase in population percentage of ICT usage from an initial 32.8% in 1998 to 79.4% in 2019 which further supports both Compaine's and Martin's predictions of growing usage. This poses the question as to what did the data show regarding the digital divide. According to Remaley (2020), the 2019 NTIA data, collected prior to COVID, revealed a persistence of the digital divide through significant gaps across race, ethnicity, and income levels. While there were still gaps found across race and ethnicity, Ramaley (2020) states that the data suggests the gaps have narrowed across internet

usage. Despite overall gains in internet adoption and multiple device usage (Ramaley, 2020), the data also revealed similar past trends in significant gaps across income levels (NTIA, 1995, 1999; Light, 2001; Servon, 2002; Martin, 2003; Selwyn, 2004).

While, Compaine (2001) debates the existence of the digital divide, others noted significant gaps across data collected from 1994 to 2020 (NTIA, 1995, 1999; Light, 2001; Servon, 2002; Martin, 2003; Selwyn, 2004; Ramaley, 2020) suggesting the persistence of the 'digital divide' remains. Although Servon's (2002) assertion that, "...it is inappropriate to think about a single digital divide... varying rates at which certain groups have obtained access to IT makes it more appropriate to conceive of a range of divides" is over 20 years old, it still rings true (p. 224). While subsequent literature in this review provides some alternate frames for thinking across the digital divide, the multi-dimensional digital divides are too often reduced to a discourse. This discourse is characterized nearly exclusively in terms of a facile notion of access divided sharply by socioeconomic status, as Moldavan, et al., (2022) points out in public discussions during the height of the pandemic in addition to much contemporary literature. While not having ICT access may be in part due to socioeconomic status as suggested by Compaine (2001), Servon (2002) argues it may also be due to a complexity of underlining factors and inequalities found across schools and communities. Contrary to Compaine's (2001) argument that the mythical digital divide would resolve on its own upon universal access, Servon (2002) argued that providing ICT access to eliminate the digital divide is a myth. Thus, Servon (2002) sparked the need for a reconceptualization of the digital divide with regards to its singular view drawn from a problem of access.

Shift from 'Inequality' to 'Inequity'

Early literature, such as NTIA (1995, 1999), Light (2001), Servon (2002), and Martin (2003) use the term 'digital divide' to describe a discrepancy or gap across 'access' to or use of information and communication technologies (ICTs). Conversely, Gorski (2005), advocated for the consideration of digital inequities through a framework of seven principles across five dimensions, offering a "...more complete and progressive understanding of the digital divide that differs from the traditional..." (p. 6). The concept of perceiving the digital divide as a component of a larger picture is similarly suggested by Servon (2002). Servon (2002) suggested that the complexity of the digital divides in terms of access, training, and content is a symptom of the persistence of poverty and inequality. Similarly, Gorski's (2005) recommendation of the first principle focuses on looking beyond the gaps, looking at the bigger picture. However, Gorski (2005) called for a shift from the notion of 'inequality' to 'inequity'. Gorski (2005) urged for the consideration of digital inequities within the context of larger educational and social inequities. According to Valdez and Duran (2007), achieving equal access to ICTs at school was essential for low-resource schools but also indirectly advised towards addressing inequities across low-resource school populations. Valdez and Duran (2007) suggested that this can be addressed by providing at-home access to impoverished communities to catch up to "...technology standards existing in more privileged communities" (p. 39). As Gorski (2005, 2009) expands on the concept of access beyond the physical context in the subsequent principles, its merits are evident across more recent literature (Ritzhaupt et al., 2013; Resta et al., 2018; Williems, 2019; Moldavan, et al., 2022). Ritzhaupt et al., (2013) conducted a study in Florida involving middle school students, in which they found that the digital divide was evidently present and provided insights on the complexities of it. According to Ritzhaupt et al., (2013), "…It would appear that

access to ICT is not the major area of concern… we should now focus our attention on whether students in our classrooms are capable of using ICT resources for their personal empowerment" (p.301). This significantly resonates with Gorski's broadened concept of the 'access' paradigm.

Towards Digital Equity

The digital divide has been a subject of discourse for over two decades, appearing across literature with varied definitions and sparking controversy. In more recent literature, Van Dijik (2020) describes it as "the division between people who have access to and use of digital media [information and communication technologies] and those who do not" (p. 1). While Van Dijik's (2020) definition focuses on equalities rather than inequities, it provides a more recent foundational understanding of this phenomenon which acknowledges both *access* and *use* as key factors. Gorski (2009), Ritzhaupt et al., (2013), and Resta et al. (2018) identify access as a narrowed first step toward digital equity in education, in which it "...is more than access to computers and connectivity" (p. 991). According to Resta et al. (2018), there are three levels of divide in which most of early literature focused on the first level divide, physical access. Resta et al. (2018) explains that the second level is related to the various uses of information and communication technologies, while the third level is based on the (positive or negative) outcomes that arise from ICT usage or lack of. Furthermore, Gorski (2005) emphasized the need for support and non-hostile content experiences within the suggested foundational principles. Williems (2019) explores the impact providing support to staff, through capacity building, may have on digital inequities seen within the digital divide. Williems' (2019) suggests we address digital equity as a social justice issue by increasing technological empowerment among staff by being able "....to access targeted and nuanced professional development in order to build capability and capacity with new forms of technologies, learning spaces, and learning design and

new pedagogies" (p. 157). Further drawing from Gorski (2005, 2009), physical access to information and communication technologies does not eliminate certain inequities such as inequitable access to support towards education or professional interests in technology, affirming a non-hostile IT, cyber-cultures, and content. Williems (2019) addresses digital inequities that exist among staff by providing support and affirmation towards staff's voices and identities.

Gorski (2005) further identifies the subsequent principle to focus on who has access to and how devices and internet are used. He also urges that sociopolitical and socioeconomic motivations be considered, while also exposing capitalistic propaganda which may attempt to downsize the severity of the digital divide (Gorski, 2005). This principle resonates within Murdock' (2002) critique of Compaine's edited collection suggesting a hidden agenda is behind their attempt to diminish the severity of the digital divide. Recent literature (Resta et al., 2018; Williems, 2019; Moldavan, et al., 2022; U.S. Department of Education, 2024) further aligns to Gorski's seventh principle which illustrates the importance of exploring new methods or ideas in closing the digital divide other than attempting to provide more physical access to devices. According to Williems (2019), Gorski's reconceptualization of the digital divide sparked a shift from the notion of 'inequality' of physical access to 'inequity' of access towards digital equity.

Moldavan, et al., (2022) argues that the COVID-19 pandemic further shined brightly on the digital divide, by unmasking "...the vast disparities in racial, economic, and educational opportunities that have disenfranchised urban communities that were already the epicenters of such inequities" (p. 4). Their research demonstrates that equitable access to information and communication technologies was still an ongoing problem, despite families each having digital devices at home. This further challenges Compaine's (2001) claim that the digital divide would self-resolve through increased accessibility of digital devices. Moldavan, et al., (2022) uses

phenomenological interviews to gain insight on the perspectives and lived experiences of mathematics teachers during transition into COVID-19 online learning. The study identified four themes focused on the digital divide such as: Confronting Digital Disparities and Inequities Bridging School and Home; Modifications to Instruction and Curriculum; Benefits and Challenges to Using Digital Tools; Problematizing the Threatened Humanistic Aspect of Teaching and Learning (Moldavan, et al., 2022). The study suggests we must prioritize our focus on providing digital equity to move away from simplified notions of the digital divide. Their argument speaks in favor of Gorski's (2009) paradigm shift towards equity, by identifying inequity as a larger issue rather than inequality. The study concludes that by viewing the digital divide using the lens of equity, we can provide "...physical access to material... but also social access of such resources that empower people to participate in cyberspaces of knowledge" (Moldavan, et al., 2022, p. 22). This thinking advances Gorski's (2009) suggestion that a narrow focus on the digital divide such as physical access, lacks consideration of how information and communication technologies (ICTs) are used, or the quality of the hardware, connection, software, or even society's affirmation or lack of towards certain groups' capability of using information and communication technologies. Both Gorski (2009) and Moldavan, Capraro, et. al. (2021) suggests that this narrow focus on physical access can widen rather than reconcile the digital divide.

While Compaine's (2001) predictions may align to the dramatic increase in ICT access over the past two years, partly because of the catalytic effect of COVID on online learning, both Moldavan, et al., (2022) and the U.S. Department of Education (2024) illustrate the persistence of the digital divide. Furthermore, the U.S. Department of Education released the National Education Technology Plan in 2017, prior to the pandemic and then another in 2024 post-

pandemic, in which both agree in pushing the boundaries of the traditional singular use of the term digital divide. Both pre and post pandemic releases of National Education Technology Plan cautioned against narrowly focusing on physical access and emphasized on the need to address all distinct types of the digital divide: digital access divide, digital design divide, and digital use divide. These distinctions between the digital divides aligned with literature (Gorski, 2005; Resta et al., 2018; Williems, 2019; Moldavan, et al., 2022) that called for a reconceptualization of the digital divide as more than just physical access issues. According to U.S. Department of Education (2024), the digital use divide exists "…between learners who are using technology in active, creative ways to support their learning and those who predominantly use technology for passive content consumption" (p. 7). Access to information and communication technologies (ICTs) is crucial to the digital divide but it also goes beyond physical access because *access* to ICTs can range between active and passive usage within education. According to U.S. Department of Education (2017), physical access doesn't

> guarantee access to engaging educational experiences or a quality education. Without thoughtful intervention and attention to the way technology is used for learning, the digital use divide could grow even as access to technology in schools increases (p. 20).

While access to information and communication technologies is essential towards narrowing the digital divide, it is only the first step (Resta et al., 2018). Similarly, the U.S. Department of Education (2024) states that while emergency learning due to "…COVID-19 pandemic and emergency federal funding undoubtedly helped narrow the digital access divide, it did not close the digital use divide" (p. 13). Thus, equal access does not translate to equitable because once access is granted, inequitable digital use can rise through disparities across active or passive uses of technology (Gorski 2009; U.S. Department of Education, 2017, 2024). The goal in closing all

the digital divides is digital equity (U.S. Department of Education, 2017, 2024). This resonates well with Valadez and Duran (2007) multidimensional view of the digital divide and Gorski (2005, 2009) reconceptualization of it using an equity lens to view identity-based discrepancies in his shift towards equitable access in education.

While literature acknowledges the existence of identity-based gaps in ICT access (NTIA, 1995, 1999; Light, 2001; Servon, 2002; Murdock, 2002; Selwyn, 2004; Gorski, 2005, 2009; Resta et al., 2018; Van Dijik, 2020; Williems, 2019; Moldavan, et al., 2022), an exclusive focus on addressing issues of 'access' remains to be inherently limited. Early literature such as NTIA (1995, 1999), Light (2001), and Servon (2002) approaches the 'digital divide' through lens of *equality* aiming to eliminate identity-based discrepancies attributed to literal physical access to ICT. However, others call for a paradigm shift towards equitable access (Gorski, 2005; U.S. Department of Education, 2017, 2024; Resta et al., 2018; Williems, 2019; Moldavan, et al., 2022), emphasizing the need to view the digital divide using the lens of equity and move towards digital equity (Gorski, 2005, 2009). This case study adopted Van Dijik's (2020) more recent definition of the digital divide while employing a digital equity lens, influenced by literature such as Gorski (2005), Resta et al. (2018), Williems (2019), Moldavan, et al., (2022) and reports from the U.S. Department of Education (2017, 2024). The term, digital divide, used within this case study is recognized as a multifaceted issue, as described by Resta et al. (2018), consisting of three levels: first level-physical access; second level-uses of ICTs; third level-the positive or negative outcomes from ICT usage or lack of. Furthermore, within the context of education, this case study recognizes that this term is divided into three distinct types, as outlined by the U.S. Department of Education (2024): Digital Access Divide; Digital Design Divide; Digital Use Divide. Literature (Gorski, 2009; Resta, 2018; U.S. Department of Education, 2017, 2024)

indicates that physical access to information and communication technologies (ICTs) for all students does not translate to equitable access due to the discrepancies in instructional quality. Bull and Bell (n.d.) further emphasizes the importance of combining pedagogical strategies with technology for effective educational use. Similarly, Selwyn (2004), urged researchers to shift focus towards qualitative work that unpacks the complexities of the digital divide.

In alignment with this perspective, this case study adopted digital equity as its theoretical framework to investigate students' blended learning experiences post emergency. It seeks to extend beyond access to technology by examining the distribution of digital resources and opportunities across blended learning environments. While this section focuses on digital equity as the guiding theoretical framework, the subsequent section investigates digital capital, to uncover the complex interplay between students' access to digital resources, their digital competencies, and the socio-economic factors that may shape students' experiences in using educational technology.

Digital Capital

This section explores literature focused on conceptualizing the term digital capital and its influence on the digital divide. Towards these ends, this section begins with defining digital capital and its interconnectedness to other capitals such as economic, social, cultural, and symbolic. The section then provides an overview of Ragnedda and Ruiu' (2020) explanation of the influence digital capital has over the three levels of the digital divide, which uses Bourdieusian's system of categorization. Lastly, I walk the reader across literature on digital capital in K-12 education, particularly in relation to educational technology (Apps, et al., 2019).

According to Ragnedda and Ruiu (2020) capital can be seen as "... any resource that gives an advantage to those who own it, and who can also be accumulated and perpetuated over time" (p. 10). Moreover, Ragnedda and Ruiu's (2020) notion of capital, as a resource that provides advantages, provides context in defining digital capital. Ragnedda and Ruiu (2020) defines digital capital as

> … the historical accumulation' of both digital competencies (internalized abilities and attitudes) and digital devices (external resources), which in turn enhance the development and application of such knowledge to transform/transfer it to other forms of capital... it is possible to classify digital capital as a producer of valuable resources and, therefore, as a form of capital (p. 32).

This definition suggests that digital capital can be seen as the ability to access information and communication technologies (ICTs) resources. This can also be seen as the internalized abilities and attitudes to use ICTs also known as digital competence. Ragnedda and Ruiu (2020) provides a model for measuring digital capital known as the Digital Capital Index (DCI). Moreover, Ragnedda and Ruiu (2020) suggests that digital capital can be converted into benefits of self-improvement across other capitals such as economic, social, cultural, and symbolic. It is important to acknowledge that Ragnedda and Ruiu's (2020) categorization of the four capitals mirrors Bourdieu's system of categorization. Ragnedda and Ruiu (2020) suggests that digital capital requires accumulation that can be invested to achieve benefits for self-improvement. According to Ragnedda and Ruiu (2020) there are four key characteristics shared between digital capital and the other capitals. Ragnedda and Ruiu (2020) suggests that all capitals require investment and effort while they can be accumulated to produce social benefits and converted into other forms of capital. According to Ragnedda and Ruiu (2020), economic capital can be

accumulated, transferred, and profited from based on materialistic riches. Similarly, Ragnedda and Ruiu (2020) state that social capital consists of the accumulation, transferability, and profitability from the system of personal relationships an individual may possess. Cultural capital, on the other hand, consists of "... the intellectual capacities, the cultural assets possessed, and the educational qualifications acquired throughout the course of people's life" (Ragnedda & Ruiu, 2020, p. 11). Lastly, Ragnedda and Ruiu (2020) describes symbolic capital as the level of recognition within society that individuals have.

Ragnedda and Ruiu (2020) argue that literature has neglected to take into consideration the dynamically complex interconnectedness of capitals that may result in various inequalities. According to Ragnedda and Ruiu (2020), the placement individuals have in society is "...based on the volume and breath of their economic, cultural, social, symbolic capital resources" (p. 12). Furthermore, the individual's interest-driven behavior also helps capitalize and accumulate resources. For instance, the investment in social, cultural, and economic resources further aids their societal placement, also seen as symbolic capital which ultimately "... reinforces both social inequalities and social hierarchies" (Ragnedda & Ruiu, 2020, p. 13). In other words, the accumulated social, cultural, and economic capital is utilized as an invested towards their placement in society which further increases their symbolic capital resulting in inequalities among individuals. Ragnedda and Ruiu (2020) provides insight on how research studies use materialistic inequalities as the primary driver to the digital divide. Ragnedda and Ruiu (2020) suggests that this approach may lead to a misguided interpretation that digital inequality is rooted from material inequality rather than a combination of inequalities across the various capitals. According to Ragnedda and Ruiu (2020), economic capital may influence inequalities regarding accessibility, while cultural capital may influence inequalities regarding digital skills and

information and communication technologies usage. Ragnedda and Ruiu (2020) extends on digital inequalities further by illustrating that "... those who cannot invest neither time, effort and money are disadvantaged in terms of acquisition of digital skills in using the Internet... they are also disadvantaged in the social arena" (p. 22). Furthermore, Ragnedda and Ruiu' (2020) interpretations on literature expand further on the convertibility between capitals, while suggesting that digital capital should be considered as a bridging capital that interacts with other capitals. Moreover, Ragnedda and Ruiu (2020, p. 41) provides a visual representation of the breakdown of digital capital (Figure 3) into two major components and its subcomponents.

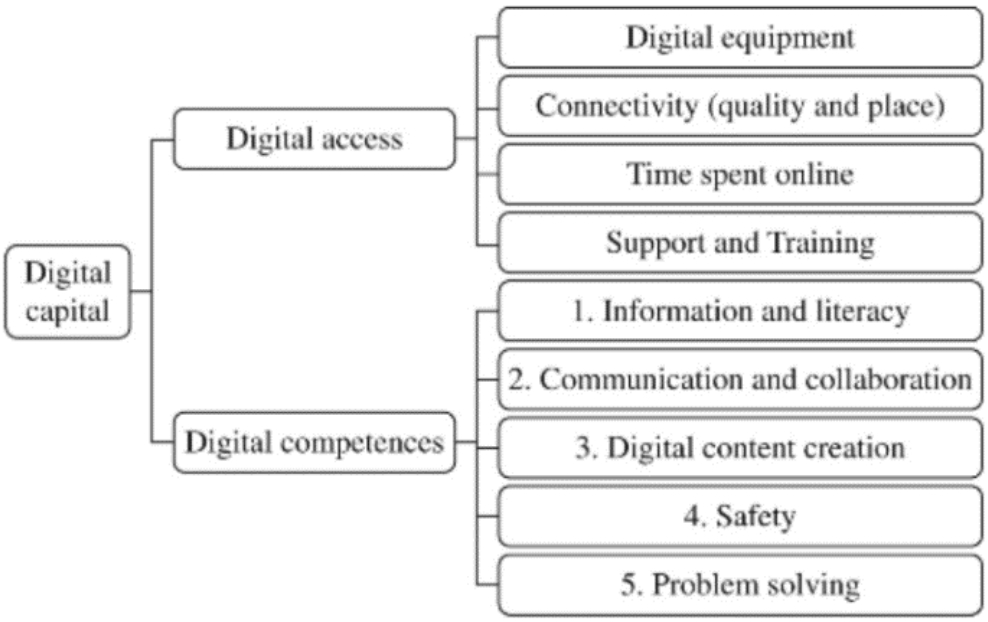


Figure 3: Digital Capital Breakdown. *Note.* From Digital capital: A Bourdieusian perspective on the digital divide, by Ragnedda and Ruiu, 2020. p. 41. Copyright 2020 by Emerald Publishing Limited.

Ragnedda and Ruiu (2020), urges a need for empirical investigation of "... how both the accumulation of digital capital (through access and competence) and its transferability can create distinct forms of hierarchies and power" (p. 32). Ragnedda and Ruiu (2020) provides examples of how individuals with high levels of digital capital may use it to acquire greater economic

capital. Then it may be converted into social and/or cultural capital, eventually into political and/or personal capital through self-improvement/profitability in the forms of money, status, respect, power, and/or lifestyles (Ragnedda & Ruiu, 2020).

Ragnedda and Ruiu (2020) further strengthens the suggestion that digital capital is a mediating or bridge capital which influences the three levels of the digital divide. Early literature (Selwyn, 2004) called for a reconceptualization of the digital divide consisting of "... the range of inequalities that currently exist in ICT-based opportunities, uptake, engagement, and outcomes" (p. 357). This early reconceptualization of the digital divide provides insight on the reference to the three levels of the digital divide as illustrated by more recent literature (Resta, et al., 2018; Ragnedda & Ruiu, 2020). According to Resta, et al. (2018) the digital divide is broken down into three levels: physical access (first level), discrepancies across information and communication technologies (ICTs) usage (second level), outcomes from ICT usage (third level). Furthermore, Ragnedda and Ruiu (2020) suggests digital capital influences the three levels of the digital divide due to its transferability across the other capitals. Ragnedda and Ruiu (2020) explains that individuals with high levels of social capital, but low digital capital are at a disadvantage due to a lower ability in profiting from the use of technologies to further enhance their social capital as opposed to those that have high levels of both. According to Ragnedda and Ruiu (2020), the various types of ICT usage are based on "... the interaction between previous capitals and digital capital that allows to capitalise previous resources and expertise and use them online, hence determining the quality and types of online experiences" (p. 25). This illustrates how the interaction between digital capital and the other capitals influences the second level of the digital divide, with regards to the various types of ICT usage. Ragnedda and Ruiu (2020) suggests that individuals with certain levels of economic, political, personal, social, and cultural

capital influence accessibility and digital skills accumulated as digital capital through past experiences. The accumulated level of digital capital will then influence the investment ability for digital resources to be used for enhancing other capital which ultimately impacts life opportunities. Furthermore, Ragnedda and Ruiu (2020) offers a prime example of digital capital's influence on the digital divide, by shining a light on 'digital reliant societies' in which the first level is narrowed greatly due to most of the population having information and communication technologies access. Ragnedda and Ruiu (2020) further emphasizes the importance of analyzing "... the consequences and social implications of inequalities in internet usages and the uneven distribution of benefits and tangible outcomes in accessing and using ICTs" (p.36). According to Ragnedda and Ruiu (2020), the discrepancies across various levels of digital capital represent the first and second levels of the digital divide (access and usage) which ultimately determines the discrepancies in outcomes of digital experiences also known as the third level of the digital divide. According to Ragnedda and Ruiu (2020) the digital access component illustrates both the type and quality of access that may influence the level of digital capital accumulated as noted from the first level of the digital divide. However, as this level of the digital divide has narrowed further, it has shined a light on the digital competence component which consists of various capacities, abilities, and skills needed for ICT usage, focusing greater attention on the second level of the digital divide. Ultimately the interconnected nature of both components determines the levels of digital capital accumulation which may result in differences across outcomes regarding opportunities in life (third level of digital divide). Thus, the accumulation of digital capital is "... needed not only to access and enjoy the digital experience but also to capitalise on internet use to acquire benefits that could improve the quality of life" (Ragnedda & Ruiu, 2020, p. 38).

Digital Capital in K-12 Education

Apps, et al. (2019) discusses exploring students' digital literacy (capital) using an initial open-ended questionnaire and subsequent interviews aimed at gaining insight into students' uses of home technologies organized around six different ranges of capital. Apps, et al. (2019) concludes that digital capital is aligned with the school field, while the lack of currency (capital accumulation) resulted in constraints within the school field. Apps, et al. (2019) urge that that less attention needs to be paid to helping students navigate the digital divide and more attention needs to be paid to reconceptualizing the technological terrain. Apps. et al, (2019) calls for more scholarly work devoted to "...designing more transformative technology-based learning experiences" meant to redesign the game (Apps, et al. 2019, p. 21). Similarly, Selwyn (2004) called for "... political recognition that the crucial issues of the digital divide are not just technological- they are social, economic, cultural and political" (p. 357). Furthermore, digital capital can be transferable to the curricular terrain beyond the classroom, particularly in relation to educational technology (Apps, et al., 2019). The U.S. Department of Education (2017) warned that due to the lack of "... thoughtful intervention and attention to the way technology is used for learning, the digital use divide could grow even as access to technology in schools increases (p. 20). Thus, while the presence of information and communication technologies (ICTs) in the K-12 education has been noted (Staker & Horn, 2012), a growing disparity has also been noted across students' use of information and communication technologies (Resta et al., 2018; U.S. Department of Education, 2017). According to the U.S. Department of Education (2017, 2024), some students may use it to create, design, build, explore, and collaborate while others may use it to passively consume media. Furthermore, Ragnedda and Ruiu (2020) suggests light be shined on the three levels of the digital divide by understanding the complexity of both

digital inequities and digital capital. Thus, the influence digital capital has over the three levels of the digital divide can be transferable to a larger curricular aim towards digital equity. Furthermore, the U.S. Department of Education (2017) suggests that "...technology can be a powerful tool to reimagine learning experiences..." (p.9), which may empower and/or disempower students to use their accumulated or lack of digital capital to reap benefits across other capitals (Ragnedda & Ruiu, 2020). This section outlines Ragnedda and Ruiu's (2020) explanation of how digital capital influences the three levels of the digital divide. It highlights how digital capital serves as a bridge capital that interacts with other forms of capital, influencing the three levels of the digital divide. Ragnedda and Ruiu (2020) argue that individuals with high levels of digital capital may use it to acquire greater economic, social, or cultural capital, ultimately impacting their life opportunities. Furthermore, the section examines literature on digital capital in K-12 education, particularly discussing how students' digital literacy impacts students' experiences in educational settings (Apps et al., 2019). The U.S. Department of Education (2017, 2024) warns of the growing disparity in students' use of ICTs, suggesting that technology can either empower or disempower students based on their accumulated digital capital. Overall, the section emphasizes the importance of understanding digital capital's role in addressing digital inequities and promoting digital equity in educational settings.

Conclusion

In conclusion, this literature review highlights the interconnectedness of blended learning, digital divide, digital equity, and digital capital, emphasizing the pivotal role they play in shaping students' educational experiences. Literature suggests that blended learning helps increase capacity among educators by becoming more familiar with innovative usages of

information and communication technologies (ICTs) for teaching and learning (U.S. Department of Education, 2017; Singh et al., 2021). This holds promise for unlocking digital potential among educators and students by building on digital capital. However, to do so issues of access to ICTs must be addressed, marked as the first level of the digital divide, in which individuals have the necessary physical access to digital resources. While the digital divide has been narrowed or bridged by emergency learning's spark in providing technology access to all students, it is only the first step towards closing the digital divide (U.S. Department of Education, 2024). The focus can now shift towards the second and third levels of digital divide which encompasses digital competence, consisting of digital capacities and skills vital for ICT usage within classrooms with technology integration, that may ultimately impact digital outcomes. The study's theoretical framework (Figure 4) depicts the interplay of these concepts in which blended learning serves as a platform for building digital capital among students.

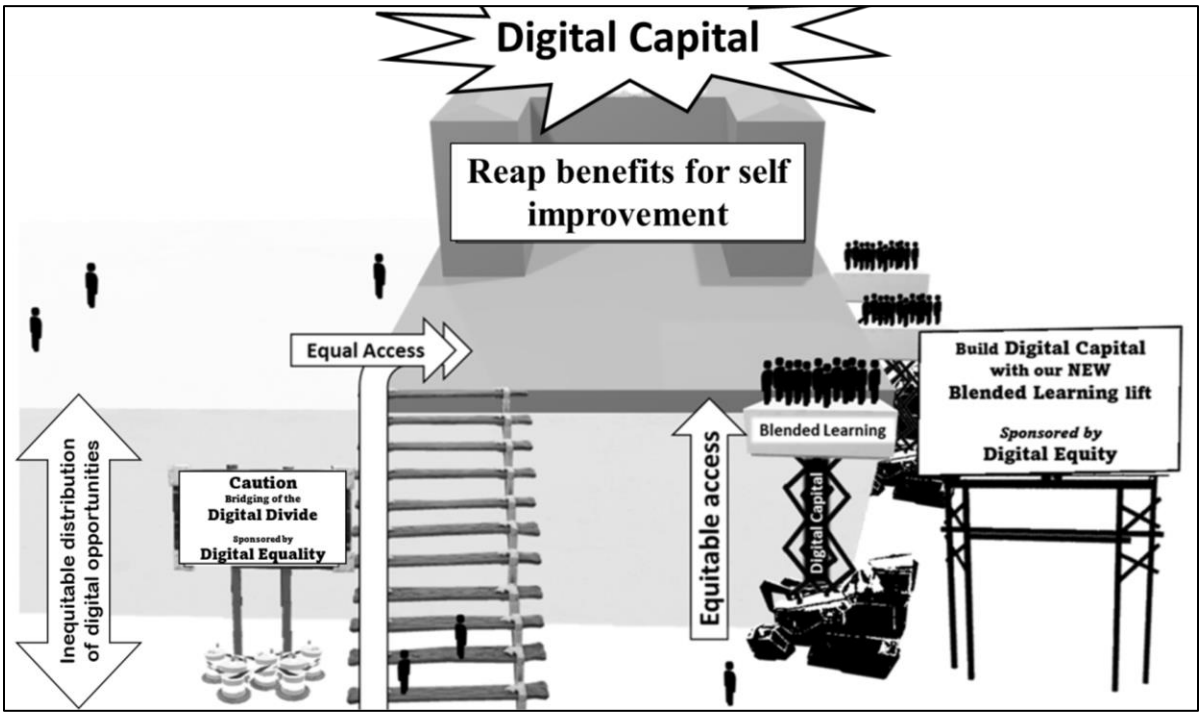


Figure 4: Digital Equity Framework

Digital equity may level the playing field in the unequal distribution of digital opportunities, allowing individuals to gain and benefit from digital capital, as illustrated in Figure 4. This showcases the transformative role digital equity may have within blended learning environments, where educators and students are provided with a platform to build digital capital. The figure illustrates how digital equity goes beyond physical access, it advocates for the fair distribution of digital resources and opportunities. By integrating blended learning within a digital equity framework, students and teachers are empowered to thrive in an increasingly digital world that addresses all levels of the digital divide to ensure equitable access and benefits for all, as similarly suggested by Novak and Tucker (2021) calling for a 'new vision for teaching' to be embraced. Through an exploration of these concepts, it becomes evident that addressing issues of access, digital equity, and digital capital accumulation is essential for fostering learning environments that empower students in the digital age. This literature review highlights the need for further research and practical interventions aimed at not only bridging the digital divide but rather promoting digital equity and building digital capital to enhance educational outcomes for all students.

CHAPTER III

METHODOLOGY

This exploratory case study explored the blended learning experiences of students post emergency learning. The case study focused on the following research question:

> How did 12th grade students, within the same public school in lower south Texas, experience blended learning in post emergency learning?

This chapter describes the research design, methods, and trustworthiness. First, it provides rationale for the selected qualitative approach used to understand students' blended learning experiences. Next, the chapter provides an overview of the research methodology: setting, participants, data collection, and data analysis. Lastly, the chapter looks closer into ethical considerations and trustworthiness.

Research Design and Methodology

Current educational technology literature (Singh et al., 2021; Saboowala & Manghirmalani, 2021; Hanny et al., 2021; Graham & Halverson 2022) illustrated possible benefits, barriers, and shifts towards blended learning (BL) in post-emergency. Graham and Halverson (2022) shared that despite emergency learning's "wide variance in experiences... it is likely that blended practices that combine both online and in-person instruction will become increasingly prevalent across all educational sectors" (p. 13). However, there was a gap in the literature regarding lived experiences from students navigating blended learning. According to Picciano, et al. (2021), blended learning is a relatively recent phenomenon and research on it has often placed blended learning as a treatment effect to test its effectiveness when compared to

other instructional models. While literature has surveyed student and teacher satisfaction regarding various blended learning models (Barkley, 2015; Gomez-Lanier, 2018; Guy & Marquis, 2016; Jakobsen & Knetemann, 2017; Tsai et al., 2015; Zafar, 2016), it has lacked emphasis on understanding the experience of students. Creswell and Poth (2016) shared that qualitative research might be an effective method to "…empower individuals to share their stories, hear their voices…" (p. 45).

Towards these ends, this case study was aimed at understanding students' experiences by interviewing students and gaining insight into how they experienced blended learning in K-12 educational settings. In this case study, I explored students' blended learning experiences post emergency. According to Creswell (2016) case studies are bounded in a set time and place based on the system being studied rather than as a methodological approach. This case study used the boundaries set by time and place when interviewing high school seniors, that were enrolled in the same public school in Texas, during post emergency school year 2022-2023. While the case study's boundaries were set by the above-mentioned time and place, the research focus was on understanding rather than explaining "...several individual common or shared experiences of a phenomenon..." (Creswell, 2016, p. 78) suggesting a case study would be appropriate. A case study approach allowed me to explore students' experiences, bound in place and time, of the relatively new phenomena of post-emergency blended learning which was full novel to them.

Case Study Bound by a Set Time and Place

As an experienced educator and advocate for educational technology (EdTech), I recognize the profound impact of the 2019-2020 school year, specifically amidst the COVID-19 pandemic. Drawing from Piaget's work, which emphasizes that individuals never truly stop learning, as we grow older, we continually accommodate and assimilate curricular and

pedagogical practices to adapt to ever-changing environments with new practices to navigate evolving environments (Huitt & Hummel, 2003). The abrupt shift to online learning, termed emergency learning, forced stakeholders of all ages to engage in rapid accommodation and assimilation processes. As an educator, I observed this period as a rollercoaster of emotions filled with uncertainties, marked by reflection, trial and error, experimentation, and innovation. While classrooms are mostly settled back into brick-and-mortar settings, literature predicts that post-pandemic education will keep moving closer towards blended learning (Novak & Tucker, 2021). Considering these developments, my case study focused on exploring how a group of students experienced blended learning in post emergency learning, in order to lend insight into larger discussions of blended learning and how it is lived out in schools. Despite a significant increase in physical access to information and communication technologies (ICTs) for students during emergency learning, literature indicates that equal does not translate to equitable access, especially considering disparities in instructional quality when using ICTs for active versus passive content consumption (Gorski, 2009; U.S. Department of Education, 2017, 2024; Resta, 2018). Thus, the case study also aimed to identify issues related to digital equity within blended learning experiences.

While the face of education has been altered by many historical events over the past three decades, Coronavirus pandemic, also known as COVID-19 ignited a constellation of rapid just-in-time pedagogical accommodations (Hodges et al., 2020). The ever-changing events surrounding the pandemic have left an infamous impression on the year 2020 (George et al., 2021). It is imperative to acknowledge COVID-19 pandemic's global impact across various domains, including healthcare, economics, technology, and education. Furthermore, it is important to note COVID-19 pandemic's catalytic effect on the technology industry, which

significantly expanded its influence and reach across various domains. Moreover, it accelerated the integration of technology into education amidst crises and social upheaval, during its emergency learning phase (U.S. Department of Education, 2024). This case study specifically focused on examining students' blended learning experiences in post-emergency pedagogy. Thus, it is crucial to contextualize this investigation within the broader landscape of educational shifts and innovations of pandemic pedagogy. Therefore, I begin by presenting an annotated timeline that maps my journey as both an experienced educator and an advocate for educational technology (EdTech) during the pivotal 2019-2020 school year:

Summer 2019: *I'm ready for another year of flipped classroom!*

December 2019: *COVID-19 made the news as a potential health crisis in China; I am thankful we are safe, and it is far from home.*

January 2020: *Tensions have grown as the virus continues to spread and make its way closer to home.*

March 2020: *Today, my AP Physics students flooded our class time with questions regarding the virus. As I took a breath to attempt to answer questions, I couldn't help but reminisce on the fall semester when my 12th graders' eyes gleamed with feelings of invincibility. But now, their eyes were unrecognizable, filled with fear and uncertainty. This was an unforgettable Friday the 13th, in which the usual precautionary words regarding spring break seemed to be the least of concerns at the time. I couldn't help but feel things were not at all usual about today's farewell.*

Spring Break 2020: *Tensions are high among teachers, parents, and students as we wait for the school board to decide when classes will resume. It is official classes will be canceled for an additional two weeks. I wonder what's next? Educational packets?*

Technology training? Never thought I would say this, but it is official we are shifting to 100% online, I'm sure this will forever be marked as a turning point in the field of educational technology.

April 6th, 2020: *My first day teaching online! I finally saw my students today. Zoom provided some comfort and normalcy, but it was far from things returning to normal. We have been informed that emergency remote learning will most likely continue for the remainder of the school year. I still can't believe that March 13th, 2020, was the last day I would see my students in person. This was not what I had in mind for this school year. Teachers are hopeful that we will return in person in August. I wonder if the virus will be contained by then?*

This annotated timeline offers an expressive backdrop against which to situate and understand the subsequent exploration of students' blended learning experiences. Reflecting on the events of the 2019-2020 school year brings forth a profound sense of uncertainty and reflection, as each milestone in the annotated timeline represents a pivotal moment in the evolution of educational practices. The journey through these events also captures the transformative challenges in the evolving landscape of education due to profound pedagogical challenges posed by the COVID-19 pandemic. Each event of the annotated timeline marks a crucial moment in the transformation of educational practices. These moments ranged from an initial excitement of implementing flipped classroom to unexpected fear surrounding the virus to the experiences during Spring Break 2020, and the subsequent shift to emergency learning. The annotated timeline illustrates the uncertainty that educators experienced during emergency learning, even those of us who were already skilled in online teaching. It also suggests a potential pedagogical turning point, which stood and still stands to leave a lasting impact on the

way we approach teaching and learning. As the pandemic ravaged across Texas and other states, it resulted in many school districts nationwide to close for the remainder of the school year (Chavez & Moshtaghian, 2020), thrusting educators into a whirlwind of rapid instructional adjustments. With minimal notice and preparation, districts were compelled to pivot abruptly to online learning, a phenomenon that the educational community coined as emergency remote teaching (Hodges, et al. 2020; Sosa Díaz, 2021), also known as emergency learning, to distinguish it from planned online education. While some districts successfully transitioned to emergency learning, others struggled to provide the necessary technology. These districts had to use instructional packets for the rest of the year due to the abrupt transition. For many in the educational community, the 2019-2020 school year symbolizes the onset of widespread school closures and the birth of emergency learning.

Reflecting on the widespread challenges faced by school districts during COVID-19 pandemic, my journey into emergency learning was marked by a significant shift from my prior experiences with online learning. Despite my educational background and expertise, that have equipped me with unique perspectives and serious technological skills, the announcement of emergency learning brought a sudden sense of unpreparedness. As March 13th, 2020, stands engraved in my memory as the last day my son experienced an in-person classroom. Juggling multiple roles as a mother, wife, educator, and graduate student, and navigating the challenges of emergency learning presented unparalleled difficulties. In the subsequent narrative, I provide another annotated timeline, designed to offer temporal context regarding the pedagogical moment preceding the post-emergency moment in which this case study exists. During this period, educators experienced significant emotional and physical stress as they navigated numerous technological and pedagogical adaptations necessitated by the onset of the pandemic.

The early days of the crisis demanded rapid assimilation and accommodation of new pedagogical and technological approaches, which came to be known as emergency learning.

> **Emergency Learning is announced**: *We are switching to 100% online! Ok, what do I need to make this happen? What do students need? What will parents need? The clock is ticking... April 6th, 2020 is the big day... remember the first day is everything, it will set the stage! Stay focused! How different can it be from a flipped classroom? [Pause, I have my online graduate class today, maybe I can get some ideas there]*
>
> **Two Weeks till April 6th, 2020:** *It is very different! Things keep changing, I miss flipped classroom…What if nobody wants to turn on their cameras? What if no one wants to come off mute? The awkward silence in an online meeting is the worst... Ok here I go let's start from the beginning…. [Pause, son wants to play] … What's needed for the first day of school? Set clear expectations [Pause, need to send a quick how to video for a teacher with a question on how this tech works] … Ok clear expectations [check], Classroom Rules [check], Procedures [Pause, time to make dinner then complete homework] … Ok back to Procedures… How will students receive and submit work? What if they need to go to the restroom or step away during class? What if they are absent? [Wait, are they counted absent?] Admin said they are absent if they don't show up to the live sessions. [Wait, what if they log in later and submit the work?] Admin said they are present if they have any online activity during the 24 hours.*
>
> **One Week till April 6th, 2020:** *Where was I? Classroom Procedures [check, well sort of as of right now] Next, specific class routines during live sessions for the course content and feedback [Pause, need to attend another virtual professional development] Teachers are overwhelmed with new tech, wish I could help more … Remember to demonstrate*

presence during live sessions and asynchronously…. How can I be more available to students and parents? [Pause, do a quick video call to help a teacher navigate the platform] How can I provide quick feedback? [Pause, show son how to use his school platform]

One day till April 6th, 2020: *Messages and emails from educators struggling to navigate technology has been overwhelming... I could hear it in their voices, experienced teachers feeling like first year teachers… I feel like that too… it is different for everyone... I've been focused on implementing best practices for online learning, others are simply trying to wrap their minds around navigating technology... best practices for online learning maybe last in their ever-growing priority list… Good news is I'm done uploading course content… Almost there!…[Wait, I need to upload how to videos for students/parents] …. [Wait, I need to make a schedule for my son to follow while both my husband and I are teaching live sessions] … [Wait, what time is it?] 4AM! Ok if I go to sleep right now, I will still have a good two hours before I need to wake up to make breakfast and get my son ready for his first day of online class… [Pause, fell asleep with computer]*

These narratives are meant to remind readers that although I am the researcher in this case study, I am also an experienced teacher who was and still is grappling with the challenges posed by these pedagogical shifts. While I did not directly teach the selected participants, I am implicated to their experiences through my own journey as an educator navigating the complexities of blended learning. While this case study focuses on students' experiences, my experiences as an EdTech experienced teacher color the case study. As this case study explores students' blended learning experiences post emergency, it is essential to recognize the contextual

backdrop provided by these narratives which led to the birth of emergency learning and subsequently gave rise to emergency learning's prodigy (blended learning) as schools transitioned back into in person settings. Interview data reveals that students have strong feelings about the instructional practices and design associated with blended learning, which emerged as a result of the transition from emergency learning during the pandemic. I preface this dissertation with these narratives to take readers back to the liminal space between emergency learning and blended learning, highlighting the profound impact of the pandemic on educational practices and design.

As this case study suggests students' experiences were not blind to the fact that even tech-savvy educators faced challenges in adapting to the technological and pedagogical assimilations and accommodations in which data demonstrated that blended learning required. Similarly, in this case study I struggled a bit to reconcile my role as a teacher and researcher exploring student's experiences of an unfamiliar pedagogy for blended learning that emerged just outside the edge of a particularly disruptive period in education (the pandemic), which for many teachers was the most dislodging pedagogical moment of their career. This exploratory case study focuses on students' blended learning experiences situated in the post emergency learning moment. As a researcher and teacher, so am I.

Setting and Participants

This case study followed a qualitative case study approach consisting of heterogeneous purposeful sampling of learners at the same public high school during post-emergency school year 2022-2023. The high school selected for this case study, Valley High School, was a public non-profit in a border town in southern Texas. According to the 2021-2022 CCMR, the student population of this campus consisted of 0.1% African American, 0.1% White, and 99.8%

Hispanic. The school was 29 years old and well known for its fine arts department along with Early College standing. The school offered high-quality education ranging from TEKS aligned core courses, advanced level courses such as Advanced Placement (AP), Honors level, and dual enrollment courses. The school also offered nine different CTE clusters for students to select as their endorsement: Agriculture Food & Natural Resources; Business, Marketing & Finance; Arts, Audio, Visual Technology & Communications; Education & Training; Health Science; Law enforcement; Manufacturing; STEM (Science, Technology, Engineering, Mathematics); STAMP and SPACE. Furthermore, the 2021-2022 CCMR stated the following program identifiers: 96.7% Economically Disadvantaged; 26.5% English Language Learners; 14.7% Special Education; 75% At-Risk; 12.4% Gifted & Talented Education; 92.4% Career & Technical Education.

Based on government guidelines, this school shifted to 100% online learning in March 2019 with very little notice and preparation, due to the COVID-19 pandemic. Then the 2020-2021 school year gave rise to various forms of innovation within the school district to provide both online instruction and face-to-face in a brick-and-mortar classroom. According to Staker and Horn (2012), this instructional model may have resembled instructional models within the umbrella encompassing blended learning such as that of the Enriched-Virtual model, flex model, individual rotation, etc. However, literature has debated how to categorize the instructional learning models used during the pandemic; some have referred to it as emergency learning or simultaneous learning (Fisher et al., 2021) due to its unpredictable and ever-changing nature. While the 2021-2022 school year also offered an online learning option it was no longer offered within Valley High School rather it became its own virtual school within the school district. Classrooms within Valley High School returned to face-to-face instruction in a brick-and-mortar

classroom setting. While the abrupt shift into fully immersed online experiences may have further shined a light on the inequitable experiences students encountered in K-12 education, literature suggests blended learning (BL) will rise further in the post-COVID era (Jones & Sharma, 2020; Hodges et al., 2020; Singh et al., 2021; Novak & Tucker, 2021). In this case study, I explored how students experienced blended learning in post emergency learning.

Upon Institutional Research Board (IRB) approval, school district and campus approval, students were recruited to participate in the case study during the post-emergency school year 2022-2023. Participants were randomly selected using a CTE endorsement list provided by the campus CTE counselor. I was provided this list upon approval from the principal to request access as a district employee approved to conduct a research case study on campus. I used an online random number generator to randomly select a row from the student list provided. I then recruited participants by calling the parent/legal guardian of the corresponding student in the randomly selected row. I read the recruitment script to parents/legal guardians (Appendix A), in which parents/legal guardians gave informal approval for their child to participate upon the child's agreement. Those that agreed were told by their parents/legal guardians to stop by my classroom to obtain the parent/legal guardian permission slip (Appendix B) and informed consent (Appendix C). Once, each randomly selected participant submitted both parent/legal guardian permission slip (Appendix B) and informed consent (Appendix C), I informed them of the potential risks and benefits of participating in the case study. Upon participant and parental agreements, I began conducting individual interviews in March 2023. Overall, this type of sampling allowed for the selection of participants with lived experiences regarding the phenomenon to be randomly selected based upon their availability.

The sample size in this case study included (N=10) ten high school students (from various CTE endorsements): A total of ten participants were interviewed. The participants were all seniors aged 17-18. The CTE endorsements varied: two from Law Enforcement; two from Arts, Audio, Visual Tech & Com; one from Business, Marketing & Finance; one from Biomedical Studies; one from Education & Training; one from Health Science; one from Agriculture Food & Natural Resources; one without an endorsement. Participants varied in receiving advanced academic services through enrollment in advanced courses such as Honors, AP, and Dual enrollment courses. Some participants stated to be enrolled in such advanced courses while others stated that they were not enrolled in any such courses as shown in Table 1.

Table 1. Description of the Case Study Participants

Participant	Pseudonym	Career Technology Education Endorsement	Participated in Advanced Courses
P01	Marisol	Law Enforcement	Honors, AP Courses, Dual Enrollment
P02	Alicia	Business, Marketing & Finance	none
P03	Gabriel	Arts, Audio, Visual Tech & Com.	none
P04	Alejandro	Biomedical Studies	Honors, AP Courses, Dual Enrollment
P05	Daniela	Law Enforcement	Honors, AP Courses, Dual Enrollment
P06	Isabel	Arts, Audio, Visual Tech & Com.	Honors, AP Courses, Dual Enrollment
P07	Jose	Education & Training	Honors, AP Courses, Dual Enrollment
P08	Rosa	None	none
P09	Silvia	Health Science	Honors, AP Courses, Dual Enrollment
P10	Ramon	Agriculture	none

Throughout this process, I maintained participants' confidentiality by using numerical codes (e.g., Participant 01) upon interviewing and assigned pseudonyms (e.g., Marisol) instead of their real names when developing individual descriptions. As the researcher, I was the only one who knew the identity of the participants based on their assigned codes across interview

transcripts. The development of descriptions for each participant not only facilitated a deeper connection with the data but also upheld ethical principles of confidentiality. This approach provided me, the researcher, an opportunity to deeply engage with and internalize the data collected through the interviews. Additionally, assigning pseudonyms to each participant ensured confidentiality and anonymity, thus safeguarding participant's privacy. As I captured the essence of each participant's experiences, in the following descriptions, it allowed me to gain a richer understanding of the complexities and themes present in their stories.

Marisol's general description. Marisol was a high school senior that provided a sense of determination and focus during the interviews. She was enrolled in advanced courses with a Law Enforcement CTE endorsement. Her demeanor throughout the interviews appeared engaged and enthusiastic, as she actively participated in the discussion by offering detailed reflections about her experiences. Marisol provided valuable insights into the relationship between technology and education through thoughtful articulation of her preferences and concerns regarding technology integration in her classrooms. Her journey through the various learning environments, including in-person, fully virtual, and hybrid offered insight on how technology impacted her educational experience. Marisol reflected on the challenges of adapting to different learning environments during the COVID-19 pandemic, as well as the use of multiple online platforms such as Canvas, Schoology, and Google Classroom. Based on Marisol's responses it was evident that she appreciated the flexibility that technology offered, specifically digital submissions and self-paced learning. Marisol emphasized that technology provided flexibility for her and her friends, especially those balancing school with extracurricular activities or part-time jobs. She appreciated the shift towards digital submissions because it allowed her to gain extended deadlines and easier access to assignments. Marisol highlighted the

importance of technology filling educational gaps by providing resources for independent learning. However, she also raised concerns about potential distractions and the need for a balanced approach to incorporate both technological tools and hands-on activities. Marisol noted that classrooms that excessively relied on technology, specifically science, resulted in less hands-on activities. Her body language suggested eagerness to share her insights as she would lean slightly forward at times, indicating genuine interest in this topic. She appeared confident and comfortable discussing her experiences. Marisol's adaptive persona shined brightly as she reflected on her ability to develop organizational skills and utilize digital tools based on her learning style so that she could navigate technology more effectively. Additionally, her inquisitive nature became evident as she reflected on online research and her inquiry-driven preference for tactile activities. She emphasized the limitations that virtual labs have in comparison to in-person experiments. Marisol shared how much she liked certain technological tools like Albert and Nearpod because of their interactive and engaging features. She also liked platforms that fostered student collaboration and self-paced learning, however emphasized how assignments that were timed on Canvas felt very stressful and even gave her anxiety. Marisol was very enthusiastic when describing a color-coded calendar within Canvas that showed all her assignments. However, she expressed frustration when teachers wouldn't put dates on their assignments since it would not show up on her calendar. Marisol explained that she wouldn't even know she had certain assignments that needed to be completed because of this. As she explained the unfairness of those situations, it seemed to be very upsetting for her because her body language began to tense up. Also, she emphasized the importance of maintaining a connection with teachers by having opportunities for face-to-face interaction. Marisol provided insight on the varying degrees of technology usage across classrooms and her perception of over-

reliance on technology. She expressed strong desires for a more simplified approach to technology education focused on practical skills that would be relevant to her academic success. Overall, Marisol's detailed descriptions offered insightful perspectives on the nature of navigating blended learning, the benefits and challenges it presents, the adaptive and inquisitive personas it fosters, and the varying degrees of technology usage across different classrooms. Through her reflections, Marisol emphasized the importance of maintaining a balanced approach that leverages technology to enhance learning while preserving opportunities for hands-on experiences and meaningful interactions with teachers.

Alicia's general description. Alicia was a senior, whose demeanor throughout the interviews showed a level of comfort and willingness to share her thoughts candidly. Alicia explained that she deliberately shifted away from advanced classes like Biomedical Sciences towards a Business, Marketing & Finance CTE endorsement, based on her desire for a more manageable workload. She found her business classes easier, despite her aspirations towards the field of cosmetology. Alicia expressed a desire for more senior activities and school spirit. She noted a lack of engagement among her classmates, which may be attributed to the transition back to in-person learning after a period of virtual schooling which may have disrupted the usual rhythm of senior year traditions. This also provided insight into potential adjustments that students experienced when navigating different modes of instruction. Alicia noted that there was a significant prevalence of technology in her courses. She seemed genuinely appreciative of the convenience of completing assignments online. However, Alicia candidly acknowledged its limitations, such as difficulty in understanding complex concepts solely through online research which often led to the temptation of copying and pasting information without truly understanding the meaning behind the content she came across. Alicia explained that digital platforms made it

convenient to complete assignments quickly but also created opportunities for cheating due to the ease of accessing information online. Alicia also noted how using grammatical tools for corrections had potential drawbacks. While these tools offered convenience and assistance in identifying errors, she noted that they hindered her development of essential writing skills because she became reliant on the tool to fix errors rather than learning from them. On the other hand, Alicia's adaptive persona was evident in her willingness to navigate various technological platforms. However, she expressed different levels of enthusiasm regarding these tools specifically the various ways of accessing assignments or the lack of published deadlines. She also demonstrated resilience and adaptability by making the most of the resources available to her such as accessing information online and using grammatical tools. Alicia revealed both the benefits and challenges of blended learning, but specifically expressed frustration with the lack of hands-on learning experiences in subjects like science and math. Alicia's body language became more animated with gestures, as she talked about hands-on learning and teacher guidance, illustrating her passion for the topic. She explained that this approach helped her truly comprehend complex topics, suggesting an inquisitive approach to learning through inquiry-based hands-on activities. In some classes she reflected that it would have been beneficial to have a balance between traditional teaching methods and technology, like in math. She explained that this class solely completed paper-based assignments which she noted provided a more rigorous but rewarding learning experience. However, she then added that it would have been beneficial to incorporate online resources, such as videos, to supplement the paper-based assignments. Alicia's experience with blended learning varies across different subjects and classes. While some classes rely heavily on technology for assignments and instruction, others maintain a more traditional approach. This diversity in the degree of technology usage

highlights the importance of finding a balance that meets the needs of both students and educators. Overall, Alicia's interview provided valuable insights into the dynamics of blended learning and highlights the importance of striking a balance between technological integration and traditional pedagogical approaches to foster meaningful learning experiences.

Gabriel's general description. Gabriel was a high school senior with an Arts, Audio, Visual Tech & Communication CTE endorsement, in which he stated not taking advanced courses due to his primary focus set on taking various electives, including piano, yearbook, and art courses like painting and sculpture. The blend of subjects suggested a diverse range of interests and talents. Gabriel's demeanor seemed to be calm and comfortable to engage in our conversation. He candidly admitted feeling overwhelmed and disconnected from the educational process and unable to grasp complex concepts effectively, during emergency learning. He shared that he would complete his assignments but often felt that he lacked meaningful learning experiences. As Gabriel reflected on his transition from virtual to in-person learning and admitted feeling apprehensive at first. He was concerned about adjusting to the new environment and interacting with classmates that he hadn't seen in person for a long time. He also noted having to not only adjust to a new environment but also noticed a shift in the way technology was integrated into the classroom. Gabriel explained that some of his classes still relied heavily on paper-based assignments, but others embraced Learning Management Systems (LMS) for submitting work and accessing resources. Interestingly, he also noted other classes that heavily relied on LMS platforms for most assignments. Despite initial difficulties in adapting to new LMS platforms like Schoology, Gabriel eventually found them to be more user-friendly and efficient. His insights reflected an adaptive persona, as he acknowledged both the benefits and limitations of technology in the classroom. Gabriel expressed appreciation for the

use of paper-based tasks especially in English classes where they would work on rough drafts on paper which allowed for deeper engagement with content. However, he expressed a desire for more technology in that class, to make it more fun with interactive and creative uses of technology, such as game-based learning and collaborative online projects. Additionally, Gabriel appreciated the opportunity for hands-on learning, especially in subjects like art and science. However, he expressed a desire for more creative uses of technology in the classroom, such as incorporating 3D printing into art projects or using film animations to enhance presentations. Gabriel's demeanor showed enthusiasm as he passionately discussed technology and its potential to enhance learning experiences. He felt classrooms could leverage technology to unleash their creativity and was disappointed that he was never shown how. Furthermore, Gabriel suggested an idea, holding a class dedicated to teaching creative ways of using technology in the classroom, because he felt that he would have loved to use his creativity digitally but just didn't know how. His reflections highlight the need for continued exploration and experimentation to harness the full potential of technology in the classroom. Overall, Gabriel's interview highlighted the evolving nature of blended learning and the importance of integrating technology to foster digital creativity, resulting in a more meaningful learning experience.

Alejandro's general description. Alejandro was a high school senior taking dual enrollment classes since freshman year due to his participation in the early college cohort at the selected campus. This indicated that he was academically driven and willing to challenge himself with college-level coursework along with his CTE endorsement in Biomedical Sciences. This became evident, when asked about how his senior year was going and immediately, he responded with one single resounding word 'stressful' which indicated that he was overwhelmed

or under pressure due to various academic factors. Alejandro's adaptive persona became apparent as he shared his experiences in the way he adapted to using technology for assignments, note-taking, and submissions as he transitioned from emergency learning to face-to-face learning. Moreover, Alejandro's adaptive persona became evident in his use of digital resources available to her outside of the classroom for his extracurricular activities in which he would make flyers on Canva and post on Instagram. Additionally, Alejandro highlighted the initial struggles of navigating LMS platforms like Canvas, Teams, Schoology, and Google Classroom which indicated that there was a steep learning curve for both students and teachers. He seemed to value streamlined administrative tasks, as he brought up several times throughout our interviews. While platforms like Canvas offered him convenience in tasks like notetaking and submissions, he also emphasized the challenges he experienced with usability and accessibility. Alejandro expressed frustration with teachers forgetting to publish assignments, impacting the visibility of due dates on Canvas. He shared his preference for Schoology due to its organization and the way assignments were displayed on a calendar view regardless of whether they were published or not. He acknowledged the convenience of digital submissions and the way it helped lessen the burden of physical paperwork as well as the strain on his back from lighter backpacks. However, Alejandro expressed mixed feelings about the use of technology during F2F instruction because he preferred experiential learning, particularly for subjects like math and science. He raised concerns about the limitations of virtual labs because they weren't as interactive as hands-on lab experiences which illustrated his inquisitive nature. He also provided candid sentiments about certain platforms, such as multiple calendars or locations to find his assignments or deadlines. Alejandro also emphasized the importance of a balanced approach, in which he felt that technology should not replace traditional methods entirely and that there

should be a mix of both digital and hands-on learning experiences. Alejandro reflected on the different learning modalities he had experienced and expressed a clear preference for certain tasks to be completed digitally while traditional paper-based methods were his preference for others, such as note-taking, journaling, and reading. Alejandro became increasingly enthusiastic when he expressed interest towards incorporating technology creatively into assignments, such as using multimedia presentations instead of traditional PowerPoint slides. On the other hand, his demeanor changed drastically as he began to talk about his math and social studies where videos were often played during class, illustrating a sense of frustration. As he paused to take a deep breath, it was evident that he wanted to share more. Alejandro then shared that he often felt that he wasn't really learning much, which indicated a possible sense of disengagement, which led him to provide constructive feedback on the use of instructional videos. He noted that the videos needed to be shorter and suggested the use of interactive learning platforms like EdPuzzle and Nearpod to increase his engagement, which implied a passive content consumption in its current uses. He also hoped for more opportunities to use collaborative digital tools that facilitate seamless teamwork and project-based learning. Overall, Alejandro's responses reflected a range of emotions and attitudes, including stress, frustration, familiarity, and a desire for a more meaningful balanced approach to learning with technology.

Daniela's general description. Daniela was a high school senior that distinguished herself by successfully completing numerous advanced-level courses within the same semester, throughout her high school career, while also engaging in a Law Enforcement CTE endorsement. Daniela's body language provided visual cues of her sincere amazement about reaching a momentous milestone, which was the completion of an associate degree while still in high school. There was excitement in her voice as she shared news about her senior year highlights.

Daniela reflected on her journey, specifically about the initial shock of transitioning into virtual classes during her sophomore year. This experience made it clear that she was adaptive to various learning environments based on her transition to emergency learning despite her unfamiliarity with using digital tools and then again to her return to in-person learning. Daniela's body language shifted to a more hunched posture to illustrate shame, as she candidly shared how much she struggled with technology. She recounted moments of confusion over what she referred to as basic digital tasks such as submitting a PDF, highlighting the steep learning curve that she experienced. Based on her facial expression, Daniela shared a sense of shame in her confession of feeling that she did not learn much during emergency learning. Despite her candid confession of not being tech-savvy, her transition between instruction provided insight on her adaptive persona as she attempted to adapt to her changing learning environments. Daniela noted that upon returning to in-person learning, there was a shift in instructional approaches in which some teachers favored paper-based assignments over digital submissions and while with others it was the complete opposite. Throughout both interviews, Daniela shared numerous times that she felt more comfortable with pen and paper, but she had adapted to doing most tasks digitally. Daniela expressed a sense of nostalgia, as she recalled solely writing on paper before having been pushed into primarily taking digital notes. She embarrassingly admitted having bad handwriting now due to her decreased use of it. Daniela enthusiastically engaged in our conversation about hands-on activities over virtual simulations, in which she made it adamantly clear that she valued hands-on learning experiences more. Furthermore, the interviews illustrated that Daniela found technology to be both a helpful tool and a potential distraction. She acknowledged the necessity and convenience of technology for storage and submissions but also felt that it needed to be moderated, especially in the classroom,

to avoid it becoming overwhelming. Platforms like Google Classroom and Canvas provided simplified submission processes, offering efficiency and accessibility. However, she emphasized the importance of proper organization because of frequent occasions in which she was overwhelmed by digital disorder and clutter resulting in a hinderance rather than support in her learning experiences. Daniela also discussed the challenges of digital distractions as she embarrassingly admitted accessing and watching streaming services during class. She explained that there was a need to find a balance between technology use and personal interaction in the classroom, which highlighted the importance of effective classroom management. Daniela also advocated for a reduction of screen time during F2F class to minimize digital distractions and optimize learning outcomes. Daniela's experiences provided insights beyond the classroom, in which she expressed great regard for using technology to enhance homework assignments and supplemental learning with instructional videos.

Isabel's general description. Isabel was a high school senior enrolled in numerous advanced level courses and pursued an Arts, Audio, Visual Tech & Communication CTE endorsement. Isabel expressed a sense of relief with a smile and sigh, when asked about her current school year, this hinted at an internal comparison of the previous school year which was her first year back in person. Isabel shared her recollection of returning to physical classrooms after a prolonged period of emergency learning. She candidly expressed her feelings towards shifting in instructional modalities once again as well as the physical discomfort experienced by needing to wear presentable attire as opposed to pajamas and her glasses fogging-up due to wearing a mask. Additionally, Isabel noted a varied degree of technological integration across her courses. She explained that some teachers seamlessly transitioned back to in-person instruction by leveraging platforms like Google Classroom or Schoology but other teachers

struggled to recalibrate. Isabel showed greater preference for using Google Classroom over Schoology due to its simplicity and organization. Isabel noted that Google Classroom showed all assignments on one page which made it easier to see what's due and what's been completed as opposed to Schoology which would require her to navigate through various folders for each class. This seemed to be very important to Isabel because her voice shared hints of frustration from the lack of user-friendly interfaces and she brought up the topic on several occasions throughout the interviews. Her frustration became more evident as she explained her experiences with accessing assignments across multiple platforms. Isabel went as far as explaining that she felt it caused more challenges than good, because she had to deal with many logins on multiple websites, making it overwhelming and exhausting. Furthermore, Isabel shared numerous instances in which disparities across instructional effectiveness were evident, in which she felt certain classes effectively utilized technology and others underutilized or misapplied it. She expressed a mixture of frustration and appreciation for different teaching methods and technologies used in her classes, however her dislike, was evident by her facial expression, for virtual labs and online platforms that lacked meaningful feedback. Furthermore, Isabel's demeanor quickly shifted to show genuine interest in the integration of technological tools across disciplines to express creativity rather than passively completing assignments online. Isabel's experiences illustrated that the use of multiple digital tools and the lack of organization which contributed to storage issues made her learning experience more challenging rather than enhancing it.

Jose's general description. Jose was a high school senior, engaged in advanced level courses and pursued an Education and Training CTE endorsement. As our conversation progressed, it was evident that Jose was very reflective as he prepared to share specific

experiences that would provide insights on blended learning. He expressed feeling overwhelmed by emergency learning, through his anecdotes of sharing a limited space with his siblings during virtual classes. However, he felt that it was just as stressful or even more when he returned to in-person from isolation because of the cultural shock of being near others once again. Jose's anecdotal responses suggested he was comfortable and engaged in our conversation while also showing a mix of emotions regarding the various benefits and challenges he experienced. While Jose did acknowledge the convenience and efficiency of using technology to access information more readily and submitting assignments digitally. However, Jose also admittedly shared how easy it is to cheat during online assessments by simply doing a google search. Additionally, Jose expressed his frustration of using certain digital platforms that lacked user-friendly interfaces. Then, Jose's face shined brightly, as he explained the flexibility and convenience that digital platforms such as Schoology offered. Jose felt it was crucial to organize and centralize a location that allows easy access to assignments, communicate with teachers, and check his grades. However, Jose admittedly expressed feelings of embarrassment that he struggled initially in navigating Schoology and didn't know how to use several of its features. Jose provided anecdotes in which he felt frustrated and struggled with technology, due to not knowing how to take a screenshot, submit assignments digitally, or not knowing certain keyboard shortcuts. This suggested that he may have encountered barriers to learning due to a lack of familiarity with technology or insufficient instruction. Jose expressed a desire for more structured support in using technology and suggested that a dedicated technology class would have been helpful to develop essential skills such as typing, navigating digital platforms, and organizing files. Additionally, Jose's experiences emphasized the importance of teaching student's essential digital literacy skills to navigate various digital tools effectively. Overall,

Jose's insights shed light on the evolving nature of education in the digital age and the importance of equipping students with essential digital literacy skills.

Rosa's general description. Rosa was a high school senior without a CTE endorsement and lacked experience in advanced level courses. Initially, she recounted the discomfort and challenges of emergency learning during the pandemic, particularly in math and science classes, in which she struggled to maintain focus and often gravitated towards digital distractions like games and movies during class. Interestingly, Rosa found herself more overwhelmed upon returning to in-person settings because the integration of learning management systems like Schoology and Google Classroom became more prevalent. Rosa's tensed up body language coupled with her tone of voice suggested feelings of frustration and discomfort towards the heavy reliance on technology, despite being physically present in the classroom but still experiencing lessons through a screen. Rosa's responses suggested that her frustration seemed to stem from the disappointment of gravitating towards digital distractions once more and hindering her ability to stay engaged in academic tasks. She expressed feeling like a "robot" while typing on her laptop and longed for the hands-on experiences of pre-pandemic learning, particularly in science labs as opposed to virtual labs. However, despite her reservations of the prevalent use of technology, Rosa acknowledged some benefits such as easier access to resources and the prevention of lost assignments. She also enthusiastically noted that she enjoyed the opportunity to submit math assignments digitally after completing them on paper, which allowed her to engage more deeply with the material. Throughout the interviews, Rosa conveyed a sense of longing for personalized learning experiences and tactile engagement, in which she noted feeling disappointed at the loss of handwritten notes and physical textbooks. She struggled with organizing her digital files, which, combined with the multitude of different apps and websites

required for each class, seemed to overwhelm her. This was evident from her facial expressions and the tone in her voice as she shared these challenges. Rosa appeared significantly troubled by these challenges, to the extent that she expressed how a dedicated technology class could have helped her with these struggles, which could have taught her essential skills like organizing her digital files, typing, and fostering creativity in digital projects. Rosa also expressed interest in incorporating game-based learning platforms, such as Nearpod and Blooket, into lessons to gain a more engaging experience. Throughout the interviews, Rosa advocated for the integration of technology without completely replacing traditional methods due to her notion that solely relying on technology would diminish her engagement and creativity in the classroom.

Silvia's general description. Silvia was a high school senior enrolled in numerous advanced level courses with a Health Science CTE endorsement that valued both traditional and digital learning methods. She shared her interests in both health science and law enforcement, looking to pursue a career as a medical coroner. Silvia's body language and tone suggested a level of comfort and engagement throughout the interviews, indicating her willingness to share her insights. Throughout our conversation, Silvia described her senior year as a rollercoaster ride of emotions as she reflected on her various experiences in which some classes heavily relied on technology for assignments and communication, while others incorporated more traditional methods. This reflects a diverse approach to technology integration based on the nature of each subject. During our conversations, Silvia exhibited a keen awareness of the potential technological uses that could have on enhanced her learning experiences while also recognizing its limitations as she offered constructive feedback for optimizing its use in the classroom. She appreciated the flexibility and accessibility of online platforms but also expressed concerns about overreliance on technology, particularly in subjects that she felt required hands-on engagement.

She reminisced about her experiences in law enforcement and medical classes in which she enjoyed inquiry-based hands-on activities due to her inquisitive nature. This led her to express her desire for more engaging learning experiences by finding a balance with technology so that digital tools would complement rather than replace traditional learning methods. Silvia candidly admitted that virtual labs and online assignments were convenient but did not provide her with the same level of engagement and understanding as hands-on experiences did in the past. Silvia expressed her frustrations towards the difficulties that she encountered with glitchy platforms, as well as the learning curve associated with navigating new technology. Silvia's body language indicated her eagerness to share her thoughts on how technology facilitated collaborative projects, online discussions, and creative assignments which highlighted the diverse ways in which digital tools enhanced learning experiences. Her experiences highlighted the importance of providing adequate support and training for students and educators to effectively utilize technology in the classroom. She also highlighted the need for students to learn typing skills early on, how to navigate digital platforms effectively and the value of incorporating technology in innovative ways to foster student engagement and creativity.

Ramon's general description. Ramon was a high school senior with an Agriculture CTE endorsement. He shared insights on various themes related to blended learning, technology usage, his challenges, and preferences. Ramon reflected on his senior year by noting his experiences with both traditional and digital modalities. While Ramon did not enroll in any advanced level courses, he still experienced technological integration across his classes. He highlighted the challenges faced during emergency learning due to his lack of prior experience with computers. Throughout the interviews, Ramon's demeanor suggested a level of frustration and discomfort with certain aspects of technology use in his classes. Additionally, Ramon

reflected on his struggles with adapting to the rapid shift to emergency learning due to difficulties with various technological tasks, such as navigating online platforms, submitting assignments digitally, and using computer applications effectively. Ramon's body language and tone indicated a sense of unease and uncertainty as he recounted his experiences with technology in the classroom. He described feeling overwhelmed by the sudden transition to virtual learning during the COVID-19 pandemic. He also expressed frustration with the complexity of digital assignments and platforms. His facial expressions and gestures conveyed a sense of exasperation as he discussed the challenges faced with technology integration across his classes during post emergency learning. Ramon expressed frustration with submitting assignments digitally, experiencing many technical issues, trouble navigating new platforms especially when coupled with a multitude of websites and apps used by different teachers. This was significant because Ramon emphasized that the multitude of computer mediated elements hindered rather than enhanced his learning, providing insight on consistency and simplicity in technology usage within the classroom. Ramon discussed his challenges with virtual labs and typing skills, indicating a preference for physical labs and handwritten assignments. Additionally, he acknowledged potential benefits of teacher-made videos for content support and not a replacement of teacher-based lectures. Throughout the interviews, Ramon articulated a strong preference for tactile hands-on activities over digital work as he expressed pre-pandemic experiences in which tactile hands-on experiences were more prominent as opposed to his current classes. He stressed the significance of having access to physical materials and engaging activities that aligned with his learning style, especially in subjects like science. Ramon expressed a great deal of disappointment in that the virtual labs he experienced seemed to have replaced all the possible physical experiments that he could have conducted. Ramon's comments

highlighted his appreciation for practical, tactile learning opportunities over solely relying on digital instruction. Ramon's narrative emphasized the importance of recognizing and addressing students' individual needs based on learning styles and digital competencies to enhance the effectiveness of technology integration in the classroom.

Data Collection Techniques

The case study used semi-structured interviews as the primary method for collecting data. These "...involved an informal, interactive process and utilized open-ended comments and questions" (Moustakas, 1994, p. 114). Data was collected from participants using individual semi-structured interviews scheduled after school in the campus library, ranging between 30-60 minutes in length. Peoples (2020) recommended semi-structured interviews because provides me the opportunity to "…construct interview questions relevant to the research question… to be covered while allowing… participants to discuss other information… relevant to the case study" (p. 52). Guided protocols (Appendix D and Appendix E), consisting of four open-ended questions, were used based on the established research question. The guided protocols opened with the interview establishing an atmosphere that participants felt comfortable answering the relevant interview questions while welcoming additional relevant information.

Upon participant approval, each interview was audio recorded for later transcription and I took interview notes to use as later reference. Audio recorded interviews were then transcribed verbatim by me through manual transcription. The transcripts were then organized by numbers (P01-initial interview to P10-initial interview). While detailed notes were taken during the initial semi-structured interviews, follow-up interviews were also used to fill in any gaps seen across the data collected. I reflected on interview transcripts and field notes, in which clarifying questions were noted for follow-up interviews. I also used follow-up interviews to provide

clarity regarding previously discussed topics or arising themes. Through follow-up interviews, the participants confirmed interpretations of initial interviews which further aided in providing clarity. I then transcribed follow-up interviews and organized each interview transcript by numbers (P01-follow up interview to P10-follow up interview). Overall, the individual semi-structured interview and follow-up interview were the main methods of data collection used within this exploratory case study.

Analytic Plan

Upon completion of the interview process, I followed a systematic procedure for analyzing data. According to Peoples (2020, p. 62), the following are General Data Analysis Steps

1. Reading and deleting irrelevant information
2. Preliminary meaning units
3. Final meaning units
4. Situated narratives
5. General narratives
6. General description

These generalized steps are applicable to the modified version of van Kaam's method of analysis suggested by Moustakas (1994). According to Moustakas (1994, p. 120), the following systematic procedure for analyzing data is a modified version from van Kaam's method of analysis.

1. Listing and Preliminary Grouping
2. Reduction and Elimination
3. Clustering and Thematizing the Invariant Constituents

4. Final Identification of the Invariant Constituents and Themes by Application
5. Construct Individual Textural Description of the experience.
6. Construct Individual Structural Description of the experience.
7. Construct for each research participant a Textural-Structural Description
8. Develop a Composite Description of the meanings and essences of the experience, representing the group as a whole.

For the purposes of the case study, data analysis was guided by Moustakas (1994), Creswell and Poth (2016) and Peoples (2020) which included reading and deleting irrelevant information, determining preliminary meaning units, final meaning units, situated narratives, general narratives, and developing a general description.

Data Familiarization. Following this procedure, the first steps were essential to gain a closer look at participants' experiences. First, I became familiar with the data through numerous playbacks of audio recordings while manually transcribing all interviews. Then, as per qualitative case study protocols suggested (Creswell & Poth, 2016), I became very familiar with the data through close reading. I read all individual interview transcripts fully. Then, I conducted closer readings while rereading all details found within the transcripts. I also participated in memoing as suggested by Creswell and Poth (2016). This in-depth look into the transcripts provided me with the opportunity to perceive each participant's lived experiences. This opportunity allowed me to identify irrelevant information regarding the meaning behind participants' lived experiences, such as repetitive language. Then, initial meaning units were developed as means of describing participants' views on their experiences. Furthermore, these close readings and memoing aided me in building an understanding of the themes that emerged across participants' experiences. The use of recording and revising my pre-understandings,

assumptions, and changes in thinking through memoing all aided in the cyclical revisionary process. The identification of such preconceptions provided an opportunity to determine any follow-up interviews that were needed before breaking down all the preliminary meaning units into final meaning units, also known as major themes within the fourth step.

I then moved on to coding through inductive analysis in which similarities across shared experiences were noted on index cards and coded without any predetermined categories. Rather, categories were developed by the grouping of similarities to meaningfully reduce the data. Similarly, Creswell and Poth (2016) recommended the use of a systemic procedure that moved "... from the narrow units of analysis... and on to broader units... and on to detailed descriptions" that summarize both what and how individuals experienced the phenomenon (Creswell & Poth, 2016, p. 76). According to Creswell and Poth (2016), qualitative researchers were encouraged to "...look for code segments that can be used to describe information and develop themes" (p.193). I developed a list of statements that consisted of expected information, surprising information, and conceptually interesting information regarding the research question addressed in this case study. As suggested by Creswell and Poth (2016), each experience was given equal worth through the method of horizontalization of data. The codes were extracted from the 20 sources of interview data: 10 participants each with 2 interviews (initial & follow-up). I reduced the compiled list of statements from the interview data by combining redundant experiences and eliminating irrelevant statements regarding the research questions. Then, I clustered by grouping similar codes into categories, which gave rise to six major themes (Figure 5) from a thematic data analysis of student experiences shared via interviews. To further deepen my understanding of each participant's lived experiences, I developed general descriptions for each participant that captured the essence of their blended learning experiences and emerging themes.

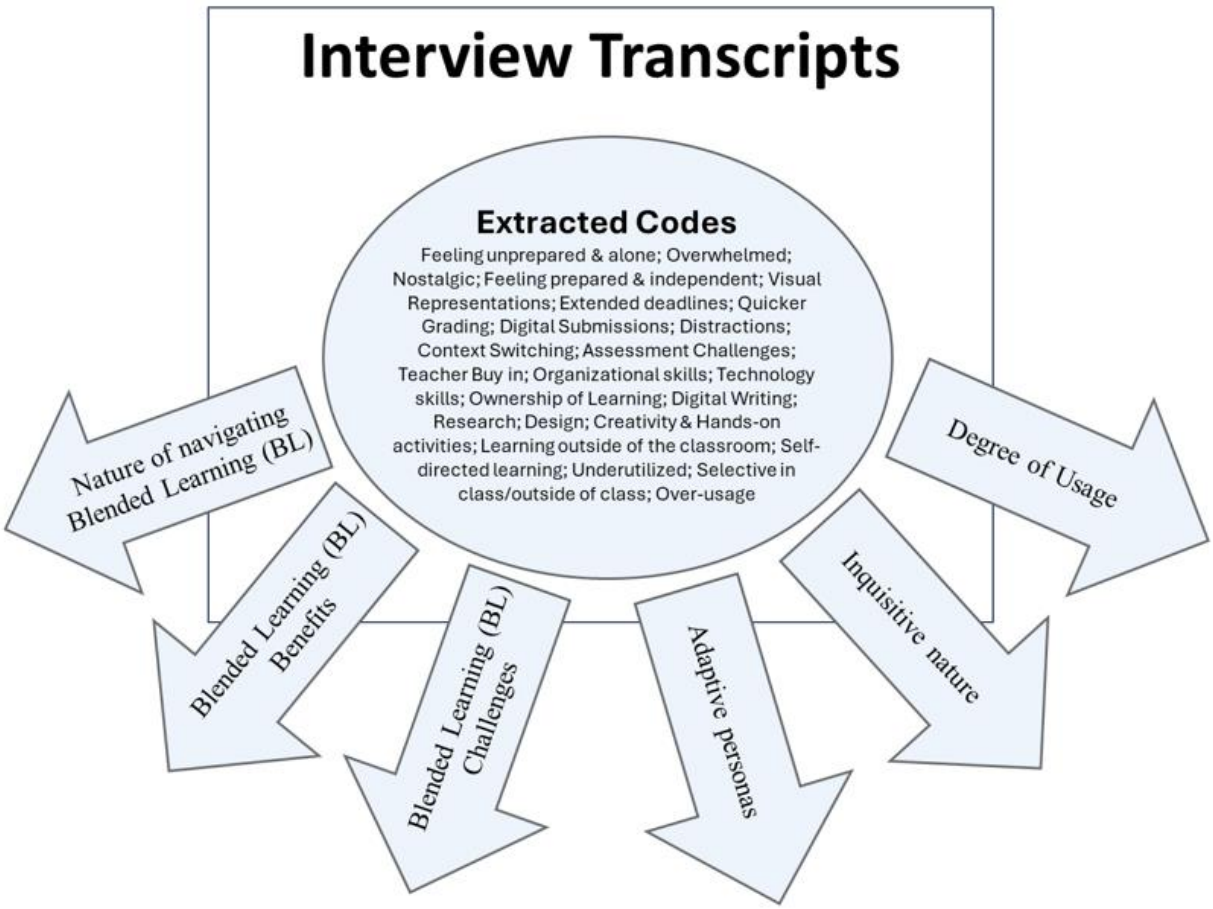


Figure 5: Thematic Data Analysis

Subsequently, the six major themes revealed the case study's key findings. The last step involved developing a general description of findings from the major themes identified in the thematic data analysis of interview data. The use of this systematic procedure for analyzing data allowed the exploratory case study to understand deeper meanings behind students' blended learning experiences, while identifying emerging themes, and developing general descriptions of the findings revealed from how students experienced blended learning.

Theme 1: Nature of Navigating Blended Learning. The theme emerged from the participants' experiences describing emotional responses to various forms of teacher presence and student engagement within blended learning classrooms. Some participants whose

experiences suggested the teacher's presence was very minimal illustrated feelings of unpreparedness, nostalgia for pre-COVID classroom settings, and a feeling of being alone. However, other participants suggested their experiences consisted of feeling prepared and gaining a sense of independence in their learning to work at their own pace. Participants' experiences suggested an emotional component was tied to the various forms of teacher presence and student engagement when navigating blended learning.

Theme 2: Blended Learning Benefits. Shared experiences illustrated various benefits participants gained from their blended learning classrooms across Valley High School. Some participants' experiences suggested that the use of visual representations through technology was beneficial to their conceptualization process. Various participants emphasized the advantages gained through blended learning regarding digital submissions. Participants perceived digital submissions as a major benefit with regards to gaining the ability to submit assignments at anytime from anywhere. This was also seen as a benefit in gaining extended time to submit assignments digitally, as many noted gaining extended deadlines. Others also determined grading was done much faster when submitted digitally, which was noted to be beneficial when tracking their academic progress.

Theme 3: Blended Learning Challenges. Shared experiences illustrated various challenges participants faced within their blended learning classrooms across the campus. Participants shared experiences rich in digital distractions mixed with numerous ways of context switching, ultimately posing as a challenge to their learning experience. Other participants shared experiences in which digital assessments strategies and overall teacher buy-in posed as further challenges to their learning. Participants' experiences suggested a physical component was tied to the various challenges faced with blended learning classrooms.

Theme 4: Adaptive personas. The theme emerged from participants' experience suggesting that they navigated blended learning by taking on an adaptive persona. For instance, some participants took on adaptive personas when developing organizational and technological skills designed to navigate blended learning more efficiently. Other participants adapted their use of digital writing to best fit their learning style needs. Some participants also suggested they gained a sense of ownership in their learning by tracking their own learning progress. Others illustrated a sense of self-directed learning by working outside of the classroom. These experiences illustrated the use of adaptive personas among participants to navigate blended learning more efficiently.

Theme 5: Inquisitive nature. The theme emerged from participants' experiences that suggested that they navigated blended learning by engaging with their inquisitive nature. Some participants shared that they would often conduct online research of topics or questions they had regarding assignments. Some even expressed the use of creative methods of researching during assessments. Participants also shared curiosity for tactile methods of inquiry within the classroom, while others expressed the desire to engage in digital creativity. Other participants shared ways in which they made sense of design flaws across platforms, as well as their solutions to improving efficiency.

Theme 6: Degree of Usage. Participants' experiences illustrated various degrees of technology usage within blended learning classrooms across Valley High School. Participants shared inconsistencies across classrooms regarding the degree of technology usage, suggesting they perceived their classrooms as missed opportunities. Other participants felt there was an overwhelming over usage of technology which lacked student engagement and classroom efficiency. However, there were other participants whose experiences suggested that they

perceived their classrooms as crafted opportunities by being selective in the usage of paper-based and digital activities both in the classroom and outside of the classroom. These selectively crafted opportunities increased meaningful learning opportunities for these participants and their overall engagement.

Provision for Trustworthiness

The ethical considerations in the case study were ensuring informed consent, disclosing the research's purpose, and maintaining participant confidentiality. Furthermore, the selected participants were volunteers and were not placed in any conditions that posed obvious risks or consequences from their participation in the case study. I submitted approval to conduct the case study within the school district and adhered to the district's criteria and guidelines for conducting research.

Researcher Positionality and Assumptions

The identification of a researcher's paradigm and perspectives is essential (Kim, 2016), as it provides insight on the knowledge that is brought in from the researcher's lived experiences (Denzin and Lincoln, 2018), as well as its influence on the perspectives used when analyzing data (Creswell, 2016). Towards these ends, this section provides background on where I'm coming from as a researcher to aid in the understating of the context and perspective behind this research. My researcher positionality can be seen as a dual identity, in which I am not just the researcher but also a teacher at the campus where this case study was conducted in. This was very important because being both the researcher and educator really shaped how I saw things, how I designed this case study, and even how I interpreted the data. Having this dual identity provided me with a whole toolkit of knowledge that came from my lived experiences as an experienced teacher and online graduate student.

I've been teaching for over a decade, in which I have had numerous trial and error opportunities focused on increasing student engagement and implementing flipped classroom. Initially, I implemented the flipped classroom model to increase F2F class time flexibility in both physics and biology courses. The flipped classroom model provided me with the opportunity to overcome the challenge of time constraints by assigning my video lectures (CM instruction) for home and opening class time (F2F instruction) to cooperative active learning activities. Using the flipped classroom model has had its challenges, especially at the beginning of each year, but the main benefit I noted was freeing up class time for active learning. As an educator in a secondary school with a predominately Hispanic student population, I also experienced the challenges of attaining ELL student engagement. To overcome these challenges, I made use of the flipped classroom to incorporate students' funds of knowledge in science during F2F and CM instruction. For instance, the simple reference to 'sugar cane' as 'caña de azúcar' in my video lectures (CM component) sparked interest among ELL students to share in class when listing examples of carbohydrates. Despite my six years of experience in leveraging the flipped classroom model, the challenges brought from the pandemic were overwhelming in which navigating emergency learning was tough even with my level of expertise with technology. However, these experiences along with online learning as a graduate student gave me practical insights into blended learning and sparked a deeper interest to continue exploring what else blended learning has to offer. As we move beyond the emergency phase, I'm eagerly trying to figure out figure out new digital pedagogies and how they impact student engagement as well as their learning outcomes.

Since the context of this case study was blended learning experiences of high school seniors, being an experienced high school teacher who has utilized blended learning for more

than six years, meant that I brought a unique perspective to this case study. As the researcher of this case study, it was crucial for me to note any assumptions that I brought in as an experienced secondary science teacher. These lived experiences have shaped my belief that blended learning can positively impact student learning outcomes. For instance, my familiarity with the flipped classroom model, which I implemented to increase flexibility in face-to-face class time, provided me with insights and assumptions regarding blended learning. I believe that the use of the flipped classroom has provided my students with an increase in positive science experiences which may have played a role in increasing their self-efficacy in science. These lived experiences have shaped my belief that blended learning is an educational gateway that educators can use to incorporate numerous innovative pedagogical strategies, such as funds of knowledge and active learning, to meet the needs of culturally diverse student populations. I believe that blended learning can positively impact student learning when careful planning is executed to deliver active learning opportunities during F2F, and personalized digital content is provided to meet their needs. According to Peoples (2020), "a person modifies the nature of understanding by this constant process of renewed projection (interpretation)… always looking through these changing lenses (new understandings) in order to understand a phenomenon" (p. 33). The process of identifying assumptions regarding the phenomenon helped me situate myself within the cyclical revisionary process of interpretation. Additionally, taking that moment to truly understand who I was in terms of inquiry was essential when I entered research relationships and tried to understand research participants' experiences through their perspectives. Figure 6 is a graphic representation of my unique positionality as the researcher in this case study, which was situated at Valley High School in post-emergency learning.

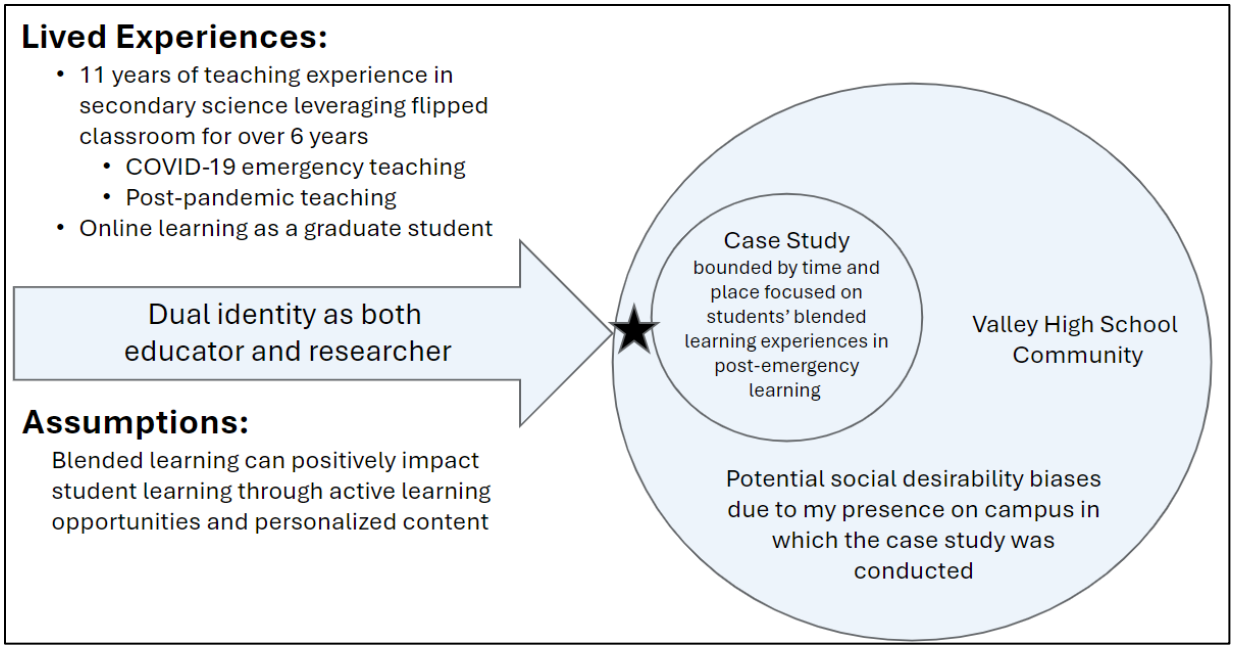


Figure 6: Researcher Positionality

This graphic representation (Figure 6) shows a star symbol, to show my dual identity, positioned at the edge of the case study's boundary within Valley High School. This position is significant because I am located within Valley High School as a teacher at this campus, with firsthand knowledge and experience of the school's environment, dynamics, and culture. However, I am not positioned within the case study, but rather on the edge of it symbolizing my role as the researcher looking in, because I didn't directly teach any of the participants involved in the case study. By being on the edge of the case study boundary, yet still within the boundaries of Valley High School, I was able to bring a unique perspective to the research. I was able to draw on my understanding of the school context as an educator while also leveraging my ability to analyze student experiences from a qualitative researcher's standpoint. Thus, my dual identity shaped how I approach the study from its initial design to the interpretation of the findings.

While the participants selected were high school seniors who were not my own students, my presence as a teacher at the campus in which the case study was conducted was noteworthy because it introduces potential social desirability biases as noted on Figure 6. Participants might have been hesitant to express opinions that could be contrary to my own perspective as an educator at their campus, resulting in an inclination to give responses that they thought I wanted to hear because of my roles. During interviews, I attempted to mitigate the potential impact of social desirability bias by establishing good rapport with participants before diving into content-specific questions. I also made it a point to emphasize during each interview that I would be using codes and pseudonyms instead of their real names. These efforts seemed to have fostered openness and authenticity among participants based on their unfiltered portrayals of their experiences along with their willingness to share both positive and challenging aspects. However, it is still important to acknowledge the possibility of bias stemming from my dual identity. Overall, my positionality as both the researcher and educator at Valley High School provides unique insights into the study's context and findings. While I did not directly teach the selected participants in this case study, my journey as an educator has involved navigating the complexities of blended learning, facing similar challenges and uncertainties as my participants. Despite my role as a researcher, I remain rooted in my identity as an experienced teacher, continuously grappling with the pedagogical shifts and technological advancements that shape education. Thus, my positionality as both a researcher and a teacher provided insights into the experiences of educators and students with blended learning, which enriched the interpretation of the data collected in this case study. This dual identity allowed me to blend practical insights gained from my lived experiences as an educator with the analytical depth of a qualitative

researcher. Ultimately, my positionality enriched the research process and enhanced the depth of understanding of students' blended learning experiences in post-emergency learning.

Trustworthiness of Data

According to Lincoln and Guba (1985), researchers can establish the trustworthiness of a case study using four criteria of trustworthiness: credibility, transferability, dependability, and confirmability. I used the four criteria of trustworthiness as discussed by Lincoln and Guba (1985). This section provides details on how the case study accounted for each criterion of trustworthiness.

Credibility. According to Lincoln and Guba (1985), there are various techniques used to establish credibility of data, some which include prolonged engagement and referential adequacy. As the researcher of this case study and experienced teacher, I established credibility through prolonged engagement over a six-year span at the participating campus learning the culture and building trust as a high school teacher. The case study established credibility through referential adequacy by audio recording semi-structured interviews with open-ended questions. These interviews provided participants with the ability to self-express using in-depth responses. I used these recordings as a "...benchmark against which later data analyses and interpretations could be tested for adequacy" (Lincoln & Guba, 1985, p. 313). I also used follow-up interviews to provide clarity and validation regarding previously discussed topics or arising themes.

Transferability. According to Lincoln and Guba (1985), it is the researcher's task "...to provide the data base that makes transferability judgments possible on the part of potential appliers" (p. 316). In this chapter, I detailed the context in which the case study was carried out through a discussion of the setting and participants and a detailed discussion of how I gathered

and analyzed data. These details "...specify everything that a reader may need to know in order to understand that findings..." (Lincoln & Guba, 1985, p. 125). These process details can enhance transferability by providing other researchers with context in which these findings may also apply.

Dependability. To establish dependability, this exploratory case study used an inquiry audit style method as suggested by Lincoln and Guba (1985) to allow the case study to be repeated. I documented the case study step-by-step using audio recordings and field notes for raw data, as well as detailed descriptions of procedures for coding and identifying themes. I also generated numerous codes and themes obtained from these recordings.

Confirmability. According to Lincoln and Guba (1985), confirmability is "...the extent to which the data and interpretations of the case study are grounded in events rather than the inquirer's personal constructions" (p. 324). I accounted for confirmability in the data through my efforts to identify researcher's bias with respect to past experiences or perspectives while working with raw data. I used field notes taken during the interviews and data analysis to reflect on the data. Then, when necessary, I added meaning to participant's responses with brackets around any words that I added. For example, the word [teachers] is placed in brackets so that my added words are identified with the purpose of adding meaning to the quote. For instance, "Sometimes [teachers] take it too far in some classes that it is like if I'm just learning from the computer because I do things on my own" (Personal Communication, Marisol, 2023).

CHAPTER IV

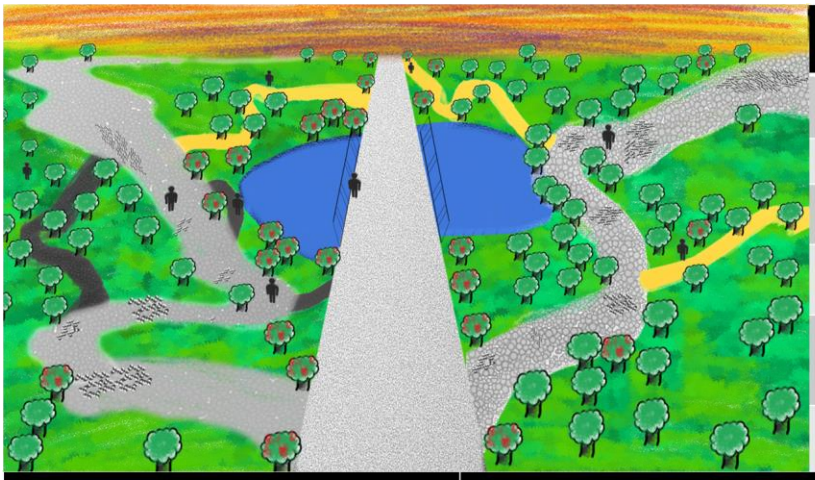
FINDINGS

While Chapter III discussed how data was gathered and how major themes were derived from analysis, this chapter provides a walkthrough of each of the key findings derived from the themes identified in Chapter III. Towards these ends, the chapter begins with a discussion of the relationship between the six major themes discussed in Chapter III and the concomitant findings. Then, I conduct a detailed discussion of each key finding from the case study, which includes:

1. Students felt computer-mediated components were the most effective when a "less is more" approach was experienced.
    a. Students shared positive feelings towards a ‘less is more’ approach used to submit assignments digitally.
    b. Students felt frustrated when they perceived their routines as inconsistent.
    c. Students desired clear standardized accessibility to digital content such as files and deadlines to become more productive students.
2. Students felt digital activities were replacing tactile activities and expressed an increasing desire for them to supplement but not replace.
3. Students were aware of the larger landscape of digital learning and what others were experiencing resulting in a feeling of the “grass is greener on the other side.”

From Themes to Findings

In this section, I analyze the six major themes that emerged from a thematic data analysis of participant experiences. First, I present a thematic arrangement in Figure 7. Following that, I describe each finding in relation to the themes they were derived from. Lastly, I dive into a detailed overview of each finding.



Theme	Graphic Representation
Nature of BL	Twist and turns along paths
BL Benefits	Horizon
BL Challenges	Rugged terrain, rocky with steep inclines
Adaptive Personas	Detours within the same pathway
Inquisitive Nature	Exploratory narrow dirt pathways leading to other pathways
Degree of Usage	Density of Vegetation

Finding	Graphic Representation
Finding 1: 'Less is More' Approach	Paths with less twists and turns in which they are more simplified making the pathways more visible.
Finding 2: Balanced Approach to Digital & Tactile Assignments	The junction in the road where different pathways diverge into one that used tactile elements primarily and the other that used digital elements, but both converge to a road that has a balance of both.
Finding 3: Unevenly Distributed Blended Learning Landscape	The scenery illustrates various paths spanning across an unevenly distributed landscape with various tones of greenery and dense vegetation in which some are fruitful.

Figure 7: Thematic Arrangement

The thematic arrangement figure shown above illustrates the graphic representation of the six themes and the three findings derived from them. I introduce this graphic here along with a summary of findings (which I discuss at length later in the chapter) to offer a visual of the 'lay of the blended learning land' that participants experienced. Data analysis uncovered key themes that shined light on participants' experiences navigating this landscape including their emotional responses, benefits, challenges, adaptive strategies, inquisitive nature, and the degree of

technology usage. The winding paths symbolize the emotional rollercoasters experienced by students in blended learning environments, where twists and turns reflect the highs and lows of their experiences. The sunset on the horizon may be perceived as a breathtaking or daunting sight depending on the path taken through the landscape representing digital inequity of benefits gained from blended learning. Rugged terrain signifies the challenges students encounter, with rocky obstacles and steep inclines symbolizing the difficulties they must overcome. Detours taken along the paths illustrate students' adaptive strategies, either simplifying their journey or seizing opportunities for growth. Exploratory pathways branching off from the main roads symbolize students' curiosity and thirst for knowledge, leading them to discover new opportunities for engagement and creativity. The density of trees throughout the landscape represents the degree of technology usage, with fruitful components sometimes overshadowed by challenges and obstacles. Together, these elements provide a comprehensive depiction of students' blended learning experiences, highlighting the diverse range of emotions, challenges, and opportunities they encounter along the way.

The first key finding, derived from these themes, emphasizes the effectiveness of a 'less is more' approach to integrating computer-mediated components in blended learning. The nature of blended learning is depicted by the winding paths which symbolize the emotional journey students experienced by the various degrees of technology usage. Some students found themselves overwhelmed by the excessive digital demands and developed alternative paths to simplify the journey with their adaptive and inquisitive uses of technology. Students with adaptive personas and/or inquisitive natures devised alternative strategies to make their journey through the digital landscape more manageable. This meant having to adapt or adjust their use of technology in more creative or innovative ways to simplify their tasks. Similarly, the sunset

illustrates the dual nature of blended learning, where beauty and fear coexist depending on their experience in navigating through challenges of excessively and/or inconsistently using technology in a blended learning classroom. Thus, the understanding that students experience blended learning more effectively when technology is thoughtfully integrated, with a 'less is more' mindset, was derived from these themes.

The second key finding, derived from these themes, emphasizes the value of a balanced approach to digital and traditional modalities that supplement rather than replace tactile activities in blended learning. The junction where two pathways diverge illustrates the varied approaches to learning modalities. One pathway represents learning experiences that primarily utilize tactile elements with minimal digital components. The other pathway represents learning experiences that heavily rely on digital elements. While some students acknowledged the benefits of digital tools, they also recognized the importance of hands-on, tactile activities for meaningful learning. The exploratory paths branching off from these pathways towards the main road illustrate how some students discovered the value of a balanced blended learning journey by gaining insight into their desires for both digital and tactile assignments that supplement rather than replace. Along these pathways, students encounter a body of water, symbolizing engagement and active participation in the learning process. Furthermore, the fruits found along the way represent digital creativity, which becomes more accessible when a balanced approach to digital and tactile assignments is experienced. The convergence of these paths highlights the significance of incorporating a mix of digital and tactile assignments that will offers flexibly to meet the diverse needs of students.

The third key finding draws from data that revealed participants' sense that the landscape of blended learning was far more diverse than the range of experiences they were being offered.

The scenery is characterized by various paths spanning the unevenly distributed landscape, which represent the disparities students experienced with digital access and resources. The different densities of vegetation symbolize the varying levels of digital access and proficiency among students. While some paths may lead to fruitful outcomes such as digital creativity and engagement, other paths remain obscured by excessive use of computer-mediated components or hindered by the lack of accessibility. Along these paths, there are various tones of green across the fields which represents students' awareness of diverse experiences across the various pathways based on what blended learning had to offer them. This awareness led students to focus on the landscape's uneven distribution of resources, igniting a desire to embark on what seems like greener pastures. This desire stems from the perceived inequities in digital assignments and teacher presence, which contribute to a sense of inequity. Thus, the importance of addressing issues related to digital equity in blended learning can be derived from the themes found across this scenery. This would offer all students equitable access to meaningful learning experiences and opportunities to gain high yield digital capital. Overall, the thematic arrangement graphic provides a metaphorical representation of the key findings derived from the six themes symbolized across the landscape of blended learning. The following section provides a detailed walkthrough of each key finding with experience-rich insights from participants, highlighting how students experienced blended learning and the ways in which issues related to digital equity figured into their experiences.

Discussion of Findings

'Less is More' Approach to Technology Integration

The first finding emphasizes that students found computer-mediated components most effective when a "less is more" approach was implemented. Nine out of ten participants

commended their teachers for using technology in tasks such as notetaking, reading passages, textbooks, completing worksheets, assessments, and submitting assignments. However, eight out of ten participants also experienced feelings of being overwhelmed when tasked with navigating multiple computer-mediated components simultaneously, either within the same class period or across multiple classes. Interview data revealed that some participants feel frustrated and exhausted from challenges posed by using multiple computer-mediated components. Participants perceived these experiences as "*...a lot to keep up for each class*" (Rosa) and "*...difficult to cater for all the teachers*" (Isabel). Isabel reported that teachers required students to visit multiple apps and websites outside of the learning platform. During the interview, Isabel appeared exhausted as she conveyed the challenges of managing numerous computer-mediated components, leading to an abundance of login credentials for each class. Isabel discussed navigating through multiple windows and mentioned that it reminded her of emergency virtual learning when "*...going to my class periods online was like having classes in different buildings*." As Isabel made this connection, a look of stress appeared on her face, accompanied by the remark, "*... it just felt like it was too much*." This vividly illustrates the significant impact that navigating multiple windows had on her blended learning experience post emergency learning which aligns with the idea that a high level of cognitive load can lead to a poor learning experience for the student (Nong, et al., 2023). Isabel's struggle with managing numerous computer-mediated components reveals the sort of frustration that Nong et al. (2003) attributes to technological integration that does not account for cognitive load.

Similarly, Ramon expressed frustration when recalling how teachers would instruct the class to visit various websites, apps, and platforms. He emphasized his frustration by stating that teachers should "*... pick one type of thing and stick to it*...." to prevent students from feeling so

overwhelmed. This specific phrase is noteworthy as it resonates with the significant impact from using multiple computer-mediated components, as illustrated by Novak and Tucker, (2021) depicting a technology-rich learning environment as opposed to a student-centered blended learning environment, which echoed across several participant descriptions. Silvia shared that using multiple computer-mediated components in daily lessons challenged some friends. Silvia further revealed that some friends withdrew from these classes because "*...it was just too much... it was an advanced class, but I think the technology part also didn't help if you don't know how to use it*." While the reason provided is not directly quoted from the friends who withdrew from the classes, Silvia's perspective on the situation is noteworthy. Silvia's description illustrates how challenging this experience was due to the use of multiple computer-mediated components and illustrates her views towards it. Ramon's frustration coupled with Silvia's description further emphasize the idea that 'less is more' when it comes to the use of multiple computer-mediated components. Ramon's plea for teachers to stick to one type of computer-mediated tool resonates with the significant impact experienced by students when faced with a variety of platforms. Then, Silvia's experiences contribute to the idea that multiple computer-mediated components within daily lessons is not only challenging but also caused some of her friends to withdraw from advanced level courses due to the compounded level of difficulty experienced by technology. Both descriptions reinforce the notion that a simplified approach to technology integration may alleviate frustration and contribute to a more positive learning experience.

Marisol explained that her teacher would frequently introduce different computer-mediated components into the lessons until the teacher realized "*...they can't handle all of this...let's just stick to these two and yea it worked!*" Notably, the teacher did not explain to the class the reason behind the change in computer-mediated components. However, Marisol's

account of her teacher's decision to simplify computer-mediated components reflects on the notion that 'less is more.' Although the teacher didn't explicitly explain the reason for the change to the class, Marisol's own conclusion sheds light on the underlying perspective that using multiple computer-mediated components was perceived as overwhelmingly 'too much'. This description aligns with Finding 1's notion that a simplified approach to technology integration can enhance student learning experiences by avoiding multiple computer-mediated components which may be perceived as more burdensome than helpful. Overall, interview data revealed that participants perceived that a 'less is more' approach helped them navigate computer-mediated components within Blended Learning. Based on data analysis and descriptions written of each participant, I have broken down this finding into three more specific sub-findings to provide insight into how students felt about a 'less is more' approach in relation to the various computer-mediated components such as completing assignments digitally, computer-mediated routines, and accessibility to digital content.

Simplified Digital Assignments. Interview data revealed that nine out of ten participants shared experiences regarding digital assignments. Furthermore, some participants shared experiences using a 'less is more' approach when completing assignments digitally. During interviews participants reported a strong preference for completing assignments on paper and submitting them digitally. For example, Marisol suggested that post-pandemic assignments have provided more flexibility to submitting assignments online. According to Marisol, "...*more time to submit whenever*..." As she reflected on pre-pandemic times, her voice was filled with amazement and gratitude in her discovery that assignment deadlines were now lengthened and the ability to submit at any time anywhere was an added benefit as well. Marisol shared that this was important for students like herself, who have jobs, because of the flexibility given in

submitting assignments digitally. This was noteworthy because she referred to this on several occasions placing a big emphasis on flexibility as a big benefit from blended learning which aligns to literature (Guy & Marquis, 2016; Kaur, 2013; Novak & Tucker, 2021).

Gabriel also expressed his preference for submitting assignments digitally. But he went on to offer details that also seem to illustrate that some students' experience of blended learning has an extra layer of hassle whereby otherwise simple processes of submitting assignments can get a little more complicated. According to Gabriel, science experiment assignments were tactile, then students completed write ups on paper. Students would subsequently type up or take a picture of the write up in order to submit through the learning platform. Gabriel was filled with excitement to share that he would get to do the labs with his hands and still submit online. Furthermore, Gabriel shared that some "… *students struggle with the whole uploading of pictures... thankfully I didn't... I usually take a picture with my phone upload it from there*." This quote provided clues on challenges that students struggled with when submitting assignments digitally. Both participants' descriptions reinforce the notion that 'less is more.' Marisol's positive experiences highlight the notion that a simplified and flexible approach to digital assignments can enhance student learning experiences by providing students with more manageable submission options. Gabriel's details of science assignments illustrate the complexity of blending tactile and digital components. Gabriel's discussion also reminds us that not all students experience the blend of tactile and digital requirements in the same way. What is experienced by some students as convenient can be experienced as a frustrating add-on for others. However, data from other participants' experiences with submitting blended assignments focuses on the latter.

Ramon, for example, adamantly shared his dislike of submitting assignments online because of the tedious process involved in uploading a picture. Ramon expressed how irritating it was for him to submit a picture, which often resulted in him giving up and not turning it in even if he did complete the assignment on paper. He stated that that the process involved taking a "*...picture with my phone, send it to myself on Messenger, then I download it to my computer from messenger and then I put it on Schoology*." The multistep process of using multiple computer-mediated components for submitting one assignment was extremely overwhelming for him and resulted in failure to submit assignments at all. Furthermore, his frustration became more evident when he stated that he wished teachers were more patient with him because he was completing the assignments on paper but that didn't matter since he wouldn't submit them online. Ramon's description shines light on the challenges blended learning can give rise to when the process involves intricate steps as opposed to following a 'less is more' approach. Ramon's inability to navigate through this tedious and overwhelming multistep process significantly impacted his learning experience, further illustrating the potential drawbacks of following a complex digital submission process. More broadly, as Ramon's refusal to submit assignments digitally so clearly reveals, blended learning's impetus to blend can be experienced in ways that directly impede student success rather than enhance it. While for others, like Marisol and Gabriel, the requirements of blended assignment submission are experienced as supporting a positive learning experience. This highlights the importance of considering the variety of student experiences when integrating technology, especially in key processes like the submission of assignments. Yet, data from all participants, regardless of their preference for submission, acknowledged the extra layer of frustration blended approaches sometimes elicited, if not for them, for their classmates. Isabel, for example, shared that she enjoyed how her physics

class was composed of paper-based activities then would be submitted online. Similarly, Daniela interestingly shared how she would often hear other students complain about submitting assignments online. They would explain to her that it was a long process of taking a picture then emailing it to open it on their computer and upload. She seemed so confused with the need to do so, "*[it] is weird because it was never an issue for me*" she emphasized. She shared that she would always upload the pictures directly from her phone which seemed to simplify things for her. According to Alejandro, he preferred "... *having [assignments] on paper and submit it online... submitting a picture of it online because I don't like doing worksheets online... I feel so stressed*." He said it was much easier to complete assignments on paper first and then transfer online or submit a picture. However, he did emphasize that this was not the case when online assignments required them to be downloaded, annotated, or drag things around. This type of digital submission was extremely tedious and often led him to get stressed out by it. Daniela, Jose and Rosa shared similar frustrations with having to drag and drop slides or annotate digital worksheets suggesting that paper-based worksheets were preferred. Similarly, nine participants stated that they preferred conducting labs in class rather than virtual labs. Gabriel, Alejandro, Daniela, Isabel, Jose, and Silvia expressed positive feelings towards conducting science labs in class rather than virtually and then submitting digitally.

Furthermore, Gabriel and Alejandro explained how submitting paper-based assignments digitally was beneficial to all including teachers because of easier access to papers to grade digitally. According to Rosa, taking this blended approach provided her the opportunity to enjoy the best of both worlds "...*being able to do it on paper, and also turn it in online for faster grading...what I really liked was that the questions were given to us on paper...I was able to like write on the paper*." Similarly, Daniela explained how in her math class she loved being able to

work out the problems on paper and submit digitally. The varied perspectives shared across these participant descriptions highlight the notion of 'less is more' for digital assignments. Participant descriptions from Isabel, Daniela, Alejandro, and others illustrate their enjoyment of completing paper-based activities and the simplicity of directly uploading pictures of handwritten work, which further emphasizes the effectiveness of a simplified process of digital assignments. Additionally, the frustration experienced by Daniela, Jose, Rosa, and others regarding the tedious process of dragging, dropping, or annotating digital worksheets further highlights the drawbacks of complex digital assignment tasks. These participant descriptions emphasize how a simplified submission process of digital assignments can contribute to a more positive and effective learning experience.

According to Silvia, working on assignments on paper then submitting online feels like "*a blessing in disguise*." She explained that submitting assignments online was initially done because of COVID but now it provided flexibility in being able to submit assignments at any time. She excitedly shared that some of her classes would do hands on activities or labs then ask them to submit a picture through the learning platform. Furthermore, Jose also enjoyed working on paper first and preferred to submit assignments online because of the added flexibility in submitting anywhere at anytime. He shared that this was easily done by taking a picture with their phone since their Chromebook camera was not very good. Interestingly, Jose shared that this method made submitting assignments very easy. Jose shared that he would work out the problems on paper, submit answers online and attach pictures of their work. Similarly, Rosa shared how much she enjoyed her math class since they "*... didn't really do much on the computer during class and all the notes were on paper, the assignments were on paper also but then we would submit online.... I did learn a lot and it's the only class I felt that I truly learned*

with technology in it." This quote resonated a great deal with me because it gave insight on student perspectives regarding technology in the classroom. Rosa inadvertently suggested that her achievement in that course was primarily due to a 'less is more' approach of computer-mediated components. Silvia, Jose, and Rosa's positive experiences with paper assignments to online submissions aligns with the notion that 'less is more' for digital assignments. The excitement shared by Silvia and Jose about uploading pictures of tactile activities or handwritten work highlights the simplicity of this method which makes the process easy and accessible. These participants' descriptions provide insights in how a simplified approach to digital assignments, by combining the strengths of both paper and digital elements, can contribute to a positive learning experience.

This sub-finding underscores that 'less is more' for students when engaging with digital assignments. Gabriel endorsed digital submission, offering insights into the balance between tactile and digital components, particularly in science labs. However, challenges emerged as Ramon articulated frustration with the intricate process of uploading pictures, resulting in non-submission. Divergent perspectives emerged from students like Isabel, Daniela, and Alejandro, who found joy in merging paper-based activities with digital submission, emphasizing the flexibility and simplicity of the process. The descriptions reflected varied stances on digital submission, with some students appreciating the simplified process from their phones and others encountering challenges with multistep digital tasks. Marisol highlighted the flexibility in post-pandemic assignment submissions, providing additional time and allowing them to select where they will complete it. While all participants acknowledged that this process was experienced by some as needlessly frustrating, all indicated the processes of blended learning could be made less frustrating by simplifying digital processes, not eliminating them. The collective insight in this

sub-finding regarding the digital submission process points to the importance of simplicity in blended learning approaches. Participants' emphasis on the details of blended learning, like the submission of assignments, offer valuable considerations for educators aiming to find a balanced and effective approach by integrating both paper and digital elements into student assignments.

Consistent computer-mediated components. A recurrent theme from interview data was the frustration participants experienced when they perceived their computer-mediated routines as inconsistent, which aligns with Jakobsen and Knetemann's (2017) sub-theme illustrating that blended learning experiences appeared disorganized to some students. Three out of ten participants grew overwhelmed by what they perceived as an unpredictable digital learning environment due to the inconsistent use of technology. The following descriptions illustrate how participants were less invested in computer-mediated components due to inconsistency, which is noteworthy because it aligns with Jakobsen and Knetemann (2017) sub-theme of student buy in. Participants' buy in of computer-mediated components was impacted when introduced to multiple tools without consistent usage of them. Participant descriptions revealed that students yearned for consistency and connected it to their ongoing refrain of ''less is more.' Isabel suggested a strong desire for consistency using a "less is more" approach due to her perceived notion that computer-mediated components were "*all over the place*." She expressed dissatisfaction with teachers for not fully embracing technology and instead using it out of obligation. Furthermore, she concluded that her teachers were simply using technology because they were expected to and "*...they want to do so much in so little time... [they] cram everything in there...*" Isabel felt so strongly about this that she went on to explain how these experiences reminded her of emergency virtual learning experiences due to the overwhelming use of multiple computer-mediated components. Isabel shared that it was a struggle "*...to learn*

how to use another site and then the teachers just jump from one thing to another... they tell us to use something new and we like stop using it after a couple of times." As Isabel shared this experience, her facial expression and tone shifted to a sense of exhaustion and frustration as she expressed herself with frequent eye rolls. Furthermore, it became more evident as she continued to bring up this struggle on several occasions. At one point, Isabel explained why she would often prefer to not use computer-mediated components in certain classes which may have inadvertently impacted her readiness to learn new content. Isabel explained that "*if you [are] just [going to] use it [computer-mediated component] once in a while, I feel it is not worth even learning it in the first place...*" On one hand, Isabel seems to be asking for more technology, but taken within context of her larger narrative, she is clearly critiquing its inconsistent use. Isabel's narrative demonstrates the ways in which the richness of blended learning was experienced by some participants as overwhelming, in which it was amplified by what they perceived as inconsistency. This can negatively diminish some students' investment in familiarizing themselves with computer-mediated components. Isabel's narrative illustrates the ways in which the inconsistency of routines can make computer-mediated elements seem like add-ons. Isabel along with other participants expressed frustration with digital layers they perceive as unnecessarily complicated. Isabel's narrative provided valuable insights on the importance of a simplified approach to computer-mediated routines to foster student investment into their learning process.

Similarly, Daniela shared experiences in which all classwork would be digital one semester and then flip back to paper the second semester. According to Daniela, "*...it was a lot of computer [use]... we would take quizzes... pretty much everything on computer. I was like, okay... and then second semester, he took that away from us... I was like really back to paper? it*

was funky." Daniela shared that she did not like it when there was inconsistency in class routines, because it made things more difficult to adapt to. Furthermore, Daniela's description reveals how students try to find patterns and routines as a way of making sense of new knowledge. However, when this is abruptly shifted into something new, it is challenging and can lead to frustration as shared by Daniela. Ramon shared similar struggles when "...*figuring something [computer-mediated components] out and then it's like no, now it is something else.*" This further suggests that the insufficient use of the same computer-mediated component may lead to the perceived notion of inconsistency when switching to other computer-mediated components. Isabel, Daniela, and Ramon shared similar experiences in which teachers would introduce them to new programs, then stop using it after a couple of times resulting in another shift towards a different program. This inconsistency amplified some participants' experience of blended learning as a frustrating addition of unnecessary complexity in ways that did not enrich learning. Specifically, Ramon expressed how exhausting this struggle was, by explaining how he likes "... *to know what to expect... I'm just figuring something out then it's like no, now something else.*" This topic seemed to be a noteworthy struggle experienced by Ramon because he referred to it multiple times throughout our conversation. Ramon made another reference to this struggle when expressing how teachers should "*just pick one … in the same place having a set routine or expectation of where to find the stuff or at least using the same thing every day and not like a surprise each day.*" Every time Ramon referred to this struggle, his tone seemed to gain a higher pitch and volume, further illustrating how strong he felt about it. Furthermore, Ramon expressed a sense of nostalgia for the pre-COVID structure in which there were clear routines that were followed every day. Daniela and Ramon's narratives highlight ways in which inconsistent practices, such as frequent shifts between different computer-mediated components, can be

experienced by students as *just too much*. Their struggle with inconsistency is recurrent in their descriptions. This further emphasizes the importance of simplicity when using computer-mediated components. The less computer-mediated tools the more opportunities for students to become proficient users. This provides greater opportunities for teachers to establish clear and stable routines when using the same carefully selected computer-mediated tools, which may contribute to a smoother learning experience. This sub-finding reveals that students became frustrated when inconsistent computer-mediated routines were experienced, which shed light on their reactions to the unpredictable use of multiple components. Three out of ten participants felt overwhelmed by what they perceived as an unpredictable digital learning environment, due to the inconsistent integration of technology. Despite the potential for spontaneity to enhance engagement, these participants expressed the opposite sentiment. The narratives illustrate how students were less engaged with computer-mediated components due to inconsistency. Isabel strongly advocated for consistency using a 'less is more' approach, expressing dissatisfaction with teachers for not fully embracing technology and using it merely out of obligation. Her struggles to adapt to the constant shift between different computer-mediated tools highlighted the negative impact of inconsistency on learning experiences. Similarly, Daniela and Ramon shared their struggles with inconsistent practices, such as frequent shifts between different computer-mediated components, emphasizing the adverse impact on student experiences. These collective narratives illustrate the ways in which the inconsistency of digital routines seems to support students' experience that computer-mediated elements are add-ons. This in turn, at least for these three participants, led to students' digital divestment which in turn led to participants' increasing sense of the computer mediated elements of blended learning as *just too much* or in other words overwhelming rather than enriching. Their narratives highlight the importance of consistency in

computer-mediated and the role consistency of routine plays in students overarching experience of blended learning. Furthermore, participants expressed a strong desire for teachers to use one computer-mediated component consistently enough for students (and teachers) to achieve proficiency, before switching to a different tool. The narratives advocate for fewer computer-mediated tools to enhance proficiency, create stable routines, and ultimately foster student investment in the learning process. Interview data demonstrates participants' desire for a 'less is more' approach to computer-mediated components. Specifically in the case of this sub-finding, consistent routines allows students to invest their time in building digital capital through proficiency as opposed to approaches in which computer-mediated components are perceived as irritating add-ons.

Enhanced Accessibility. As previous sub-findings demonstrate, pedagogical details mattered a lot to participants. One of these key pedagogical details included the ways issues in accessibility contributed to participants' perceptions of pedagogical efficiency. Six participants shared views regarding accessibility to digital content within their blended learning experiences. Participants descriptions revealed how they perceived accessibility to files and deadlines as unclear or lacking standardization due to multiple accessibility views. It is important to note that this was a topic of choice brought up more than once by participants during the interviews, which emphasizes the importance carried by each participant. Marisol expressed excitement about the productivity features available across learning platforms. Additionally, she felt that deadlines to complete assignments had been extended due to digital learning spaces. Marisol listed four major features that helped her be more efficient: the calendar with color-coded assignments, toggle capabilities between classes, class to do lists, and direct access to assignments with a click. However, she quickly added a "*downside... if it doesn't have a due*

date then it doesn't show up on your calendar... it's easy to get behind." She later explained that she could see all assignments under the to do lists or in the individual class folders. However, Marisol felt it was less efficient for her stating that it is, "*...easier when you view it in a calendar view.*" Marisol's insights into the productivity features of learning platforms highlight the importance of accessibility, as a lot of emphasis is placed on the word 'easier' illustrating its impact on efficiency. Furthermore, this provided insight on how accessibility to assignments was perceived by this participant as most effective when a 'less is more' approach was experienced through a single calendar view displaying all class assignments. Marisol's narrative highlights how a consolidated and accessible calendar can positively impact the overall efficiency of managing assignments and staying on track.

Several other participants shared similar experiences. Daniela shared how digital calendars were effective "*...if the teacher chooses to put dates....*" She explained that the lack of deadlines on assignments would often cause her to miss certain assignments resulting in frustration. Daniela felt strongly about this factor and discussed how she would often ask her teachers to include deadlines in the assignments, further illustrating the importance she placed on this factor. Similarly, Silvia placed a lot of importance on this factor. She was filled with excitement as she shared how digital calendars had helped her be more efficient with her digital assignments. Silvia explained that digital calendars "*... show your missing assignments... little icon tells you what's due today... what is due in following weeks... if you did it, a line goes through it, so it is scratched off...*" Her smile radiated a sense of accomplishment felt through these experiences. However, she then expressed how much she disliked when teachers did not publish deadlines. Silvia explained that this action had a huge impact on her digital calendar and ultimately planning. She explained that it was autogenerated by the learning platform based on

how the teachers created the assignments. Her frustration became evident as she stated "*...teachers do not understand... it only displays things with deadlines... so things without deadlines don't show up.*" She didn't seem to blame her teachers for her frustration but rather perceived them as oblivious to the student's perspectives. Silvia explained numerous occasions the impact that this productivity factor had on her efficiency, further emphasizing its importance to her. She stated that the lack of deadlines would require her to go into individual courses to check for individual assignments as opposed to viewing all in one calendar for all her schoolwork. The perspectives shared by Daniela and Silvia align with Marisol's, emphasizing the significance of displaying and accessing assignments through a single calendar further supporting this overall finding's refrain of 'less is more.' Participant narratives showed that certain learning platforms do not provide a singular calendar view of all classes, instead there is an organized view of assignments within folders, to do lists, or gradebook tab. Isabel expressed frustration with these learning platforms since "*... you have to go into folders for those individual classes for each class or each assignment, and it's way harder to see what you've already turned in... it just shows when stuff is due, it doesn't show what you've done.*" She explained that the gradebook tab provides a list view of all assignments, each with a direct link. However, she shared that these assignments are for individual classes, which meant having to toggle between classes to view the various assignments across classes. She also mentioned that it would not differentiate 'submitted' verses 'pending' assignments. Isabel shared her frustration in having to select the assignment to view any submissions rather than displaying that she had completed it already. Additionally, Isabel shared similar feelings of frustration when having to navigate through multiple windows for self-paced math modules. Her dislike and frustration were evidently expressed with her evaluation of the learning platform stating that "*...the designer of*

this program put together all the things that I don't like... plus made everything really tiny..." As she continued to discuss this learning platform it was clear that she struggled completing assignments due to formatting and navigation issues rather than content knowledge. According to Isabel "*...when you want to go to your assignments you have to go through six dropdowns... get to the page called recommendations...it shows what your teacher wants you to do, really small in the corner.*" This participant's frustration seemed to stem from having to navigate through multiple windows in order to access material. That works in tandem with other pedagogical details to color students' experience of blended learning, particularly the computer mediated elements, as unnecessarily complicated rather than enriching. Isabel's frustration with the lack of differentiation between assignments submitted and those that are still pending illustrates the complexities that may be involved when accessing compartmentalized computer-mediated components. This compartmentalization of assignments and files would result in her selecting each assignment individually to view submissions, further illustrating the complexities in accessibility that students may experience. This narrative further highlights the ways in which pedagogical details such as those regarding accessing key course information are very significant elements of participants' experience of the landscape of blended learning and reiterates participants' emphasis that 'less is more' in computer-mediated components.

Several participants also shared frustration regarding accessibility to files when a 'less is more' approach was not experienced. According to Daniela, "*teachers sometimes take for granted that since it is all digital, we would access it quickly but like it comes down to if we actually organize it or [if it's] easy to find.*" She explained that finding digital files was often a problem because she did not label or organize. Similarly, Alejandro stated that he would open google docs to type his notes but then have all the files displayed in google drive without folders

which would overwhelm him. Additionally, Rosa expressed frustration that she could not find digital files sometimes because teachers would use google docs while others use office, resulting in two separate digital file storage areas This was noteworthy because several participants shared similar situations due to multiple digital file storage platforms being used making it difficult to keep up with. The presence of multiple storage areas creates confusion and difficulty in keeping track of files which highlights the collective student desire for a 'less is more' approach. This further advocated for a centralized digital file storage area that simplifies the process for student access. Daniela, Alejandro, and Rosa's frustrations again highlight the way pedagogical details like digital file storage management color their experience of blended learning. The participant narratives highlight a collective student desire for a 'less is more' approach in accessibility across computer-mediated components in blended learning environments. Participant narratives from Marisol, Daniela, Silvia, and Isabel collectively emphasize the importance of simplicity, cohesion, and user-friendly for effective accessibility. Daniela and Silvia shared frustration regarding the absence of assignment deadlines and numerous access points on their digital calendars. This insight was interesting to note because it seemed contrary to what some students may feel regarding too many deadlines looming on a singular calendar. Participant narratives revealed that they preferred to see all assignments in a singular place, emphasizing a 'less is more' approach to assignment accessibility. Isabel struggled with differentiating between submitted and pending assignments which highlighted the need for clarity in accessing compartmentalized components. Similarly, having multiple digital file storage areas would give an overwhelming number of access points to their files resulting in file disorganization. Daniella, Alejandro, and Rosa reiterated a collective desire for a centralized 'less is more' approach to digital file storage. This sub-finding resonates the importance of a 'less is more'

approach to computer-mediated components, specifically accessibility, to consolidate all their files in an organized space with a simplified view that has centralized access points to enhance students' learning experiences. This resonates well with Jakobsen and Knetemann (2017) suggestion that blended learning environments require organization to avoid negative attitudes to develop and ensure class time is productively used.

In summary, Finding 1 highlights student's need for a simplified digital learning experience that is consistent with usage of the integrated technology. While descriptions in Finding 1 show that participants' experienced elements of blended learning differently, there were clear patterns. The students' desire for a 'less is more' approach resonated across the finding as a whole and across the three sub-findings. These sub-findings demonstrate that, for these participants, pedagogical details such as processes for submitting assignments, digital consistency, and accessibility of course materials were key elements in the participants' experience of blended learning. When left unattended to it contributed to the frustrating sense that computer-mediated elements were "*just too much."* Overall, this finding illustrates that students find it challenging to navigate blended learning when faced with digital demands, that they perceive as excessive or unnecessary, emphasizing that in the landscape of blended learning 'less is more.'

Balancing Digital and Tactile Elements

While the first finding highlights students' inclination towards a 'less is more' approach in learning, stressing the importance of simplicity, consistency, and efficiency in the integration of technology, the second finding highlights students' advocacy of a balance between digital and tactile activities that supplement but not replace. Finding 2 synthesized themed data regarding participant concerns about the potential replacement of hands-on tactile experiences by

computer-mediated assignments. The topic of tactile "hands-on" experiences emerged consistently across all participant interviews. It was discussed in detail by numerous participants who reiterated their preference for tactile activities multiple times. This highlights the participants' strong perception of clear distinctions between computer-mediated assignments (digital activities) and tactile "hands-on" activities. Participants' descriptions highlight the degree to which they expressed concern about computer-mediated activities replacing what they considered genuine hands-on or tactile learning experiences. Several participants mentioned that they felt nostalgic of pre-COVID times when more tactile 'hands-on' activities used to be experienced. Participants suggested current digital 'hands-on' experiences were tedious, boring, and less meaningful, leading to a disconnect from lessons. The reduced frequency of tactile activities in class raised concerns among students that digital activities were replacing tactile experiences, fostering a desire for more hands-on activities rather than digital ones.

Participants' blended learning experiences regarding reading and writing varied. Several participants mentioned that they would read and write digitally in most of their classes. Participants noted advantages and disadvantages of participating in these types of digital activities regarding professionalism, accessibility, and auto-correction features. Additionally, participants shared feelings of nostalgia for reading printed material and partaking in handwritten work to increase meaningful learning opportunities. Silvia shared advantages of reading digitally such as accessibility. She shared "*... sometimes I don't have the time to open an actual book, or carry it around, but I'll have the time to read one on my phone or the tablet.*" The ability to access reading material anytime, anywhere on a lightweight device was a highly emphasized topic by Silvia. Similarly, Alejandro shared an advantage was "*... we don't have a bunch of weight on our back...I feel like my back started to get better.*" Both Silvia and Alejandro

shared memories of carrying very heavy backpacks due to numerous books and binders. Now things can be accessed by a lightweight portable device at any time, reducing the number of heavy binders, notebooks, books, etc. On the other hand, other participants shared various challenges with reading digitally. Alejandro explained how "... *sometimes when [digital readings] are PDF, you have to get into an app... make a text box or highlight...I just feel it's better just to write and highlight things on paper*." It was clear that he disliked reading digitally based on his tone and facial expression of disgust. Additionally, Alejandro and Rosa suggested that reading is best experienced in print rather than digital unless interactive features are available. Some helpful interactive reading features that were mentioned were text-to-speech, on click translations, definitions, animations, and easy highlighting ability. Participants' descriptions revealed reading preferences offering valuable insights into the relationship between tactile and digital activities. Silvia and Alejandro highlight advantages to digital reading. Silvia provides insight on the convenience and flexibility of reading on lightweight devices which aligns with Alejandro's comment regarding gaining relief of back strain due to a decrease in their backpack weight. Conversely, challenges with digital reading emerged from participants' descriptions expressing a sentiment that reading, particularly when interactive features are absent, is best experienced through printed material. The complexity of student reading preferences is highlighted by the convenience offered by digital reading and the tangible interactive aspects of printed materials which are viewed as irreplaceable by some students. Participant narratives collectively highlight the advantages and challenges experienced from digital activities using computer-mediated tools. While some students appreciate digital tool features, there were concerns regarding meaningful engagement, eyesight strain, and digital distractions which provide insights on the limitations of relying solely on digital approaches. The

complexity illustrated between these advantages and challenges suggests that a carefully selected integration of both tactile and digital activities may be optimal for meaningful learning experiences.

Furthermore, seven participants' experiences suggested less meaningful experiences when they typed in comparison to writing it out on paper. According to Alejandro, "*...you learn it more, because you're [tangibly] writing and reading at the same time...but when you type it, it's kind of just copying.*" Two other participants described digital notes as difficult tasks to complete. However, both Isabel and Alicia shared how auto-correct features helped them when writing digitally. Isabel explained that this feature would help her learn how to develop grammatically correct writing samples both digitally and by hand. On the other hand, Alicia explained that she enjoyed using auto-correct because it was ok to "*... mistype everything...then at the end, you just go in, click it, so it can fix itself.*" It was important to note that Alicia was very excited about this feature and saw it as the reason her writing was better when she would type it as opposed to writing it out on paper. Both participant narratives provided insight on how students may actively or passively use auto-correct features resulting in various levels of meaningful learning outcomes. Other participants shared experiences in which digitally writing notes or journal entries would result in less meaningful writing samples. According to Rosa "*...[typing] would slow down my actual process of thinking so often I would just copy straight from the reading because it was too difficult to think of a personalized answer.*" Her tone of indifference towards writing digitally was noteworthy because she provided insight on how she perceived her learning to be less meaningful. Similarly, Alejandro also referred to digital journals as less meaningful experiences when compared to tactile journal writing. He explained that tactile writing in journals would allow him to express more emotions, making it more

meaningful. Alejandro made it clear that this was different than typing away in a hurry to make sure he submitted before the bell rang. These participant narratives emphasized the impact digital writing may have on their learning outcomes. Additionally, participants also expressed concerns regarding the physical stress placed on their eyesight due to overusing technology which impacted their learning outcomes. Three participants stated that they would end up with headaches due to overusing technology for schoolwork. On the other hand, Rosa shared that she was grateful for the numerous supplemental resources available at any moment on her devices to help her gain better understanding of difficult concepts. However, she added that accessing these resources often led to digital distractions such as games, videos, social media, etc. According to Jose, digital writing often resulted in getting "*sidetracked and look[ing] at social or videos... it was too confusing and too distracting.*" Jose gave a defeated look as he explained that he would get overwhelmed with digital assignments resulting in him giving into the easily available digital distractions. Similarly, Daniela stated that she wished teachers could "*...minimize the digital distractions... minimize it in a way to have more personal learning interactions.*" Participant narratives illustrated the benefits of digital reading/writing and the challenges such as limited ability to interact with text, increased stress on eyesight, and digital distractions. However, these narratives also provided insight on how they felt about both digital and tactile activities, in which they enjoyed using but to a certain extent. Additionally, participants expressed a sense of loss when tactile activities were replaced by digital ones, suggesting a perceived inadequacy in their learning environments. Interview data showed that participants seemed to want a well-rounded educational approach that incorporates both tactile and digital elements, enhancing engagement, meaningfulness, and student satisfaction in their learning experiences.

Several participants suggested they enjoyed it when there was a blend of tactile and digital writing opportunities. Participant narratives further revealed how students desire for teachers to purposefully select digital assignments while allowing scratch sheets of paper to be used as quick notes, brainstorms, rough drafts, etc. They felt that this would provide them with the perfect opportunity to get the best of both worlds. Participants enjoyed writing it on paper during class and then digitally submitting the typed version of it at the end of class or as homework. However, participants expressed concern regarding certain classrooms that imposed restrictive digital expectations, limiting the participants' preferred learning processes. Rosa stated "*I feel like I was being limited... that's not how I learn... it is more professional... I wouldn't mind doing it after... during class that was just not for me.*" This suggested standardized digital expectations were established in some classrooms in which seven participants expressed concern regarding the limits it placed on their learning process. Participants expressed that they worked best when writing things out on paper then transferring it digitally. However, the expectations were to do everything digitally during class which impacted learning outcomes. These narratives collectively highlight that participants appreciate digital tools, but also value their freedom to choose the most effective method based on their needs.

Additionally, participants' blended learning experiences also varied between tactile and digital activities such as labs, worksheets, and manipulatives. Participants mentioned that they would do virtual labs in most of their science classes. All ten participants shared experiences suggesting that they were not engaged by virtual labs and/or manipulatives as opposed to the meaningful experiences gained from tangibly conducting labs and handling manipulatives. Participants shared hints of nostalgia as they recalled the pre-COVID era. Several participants explained how they felt about virtual activities and what they desired to experience more of in

their classrooms. According to Marisol, "*... I feel like we did more hands-on labs pre pandemic...after the pandemic everything we do [is] virtual labs... not the best for every lab... I love hands on activities... they stay with me more.*" This quote was noteworthy because it revealed her feelings about the shift from tactile to virtual labs due to the pandemic. Similarly, several other participants illustrated feelings of disappointment and nostalgia towards tangibly experiencing in person labs from pre-COVID era. Rosa clearly stated "*...I hated [virtual labs] those were the worst. It was so boring... I like science... when we would do a virtual lab... it was just a disappointment.*" It was evident that Rosa disliked virtual labs based on her expression and tone. However, this quote also provided insight on how she felt regarding her learning experience with a perceived notion of it being a disservice. Similarly, Alicia stated "*...I remember [my teacher] would just be up on the board teaching us or doing labs with us...that was the best part... now it's super boring with other teachers because it is mainly digital labs...*" She explained that it was confusing and difficult to stay engaged when the labs were self-paced rather than getting the opportunity to tangibly conduct the labs as a class. Daniela shared that her science class predominantly conducted virtual labs that were not engaging except for one tactile lab. Her facial expression immediately changed with a bright smile as she said that it was the most fun, she had had all year.

Participant narratives expressed a collective sentiment regarding virtual labs and manipulatives, in which they were viewed as less effective in promoting student engagement, understanding, and retention of content knowledge as opposed to hands-on tactile experiences. Participants also suggested that design and structure of virtual labs often resulted in passively interacting with the lab without meaningful learning experiences. According to Silvia most virtual labs consisted of pressing go and then passively clicking through the entire lab. This was

noteworthy because it illustrated the passive content consumption that students may experience with certain virtual labs meant to be visually engaging. This is significant because it aligns with literature which makes distinctions between passive and active information and communication technologies usage (U.S. Department of Education, 2017, 2024) in reference to the form of content consumption. According to Alejandro, "*...you don't really learn much [during virtual labs] ...it was like just clicking to click, to finish the lab.*" This further emphasized the lack of meaningful learning experiences that participants shared due to their passive click-through of virtual labs. Additionally, Isabel playfully air quoted the term "hands-on" in reference to virtual labs that often involved a lot of reading. Isabel described how she skips through the reading by quickly clicking through until the lab is completed which highlights a subtle irony in her use of air quotes when mentioning the term 'hands-on' for virtual labs, due to the passive nature of her ICTs usage. Isabel explained that virtual labs would be more engaging if they decreased the amount of reading and increased interactions led by curiosity rather than scripted. Isabel's critique of virtual labs, particularly the emphasis on extensive reading and scripted interactions, shows her desire for labs that foster inquiry and curiosity. Her suggestion to decrease reading content and increase curiosity-driven components resonates with the desire for a more engaging and exploratory approach to virtual labs. Further emphasizing that students found hands-on tactile experiences more meaningful. According to Rosa doing the same virtual and tactile lab "*...I think it would have been more meaningful...it would make more sense... but just as the [virtual] lab itself... nope not good... it was probably the worst experiences I had.*" She explained that the virtual labs felt like background information to prepare for a lab. Rosa stated that she often felt "*... like we didn't actually get to do the lab just basically read or researched*

about it." Her facial expression made her disappointment much more visible, in which her learning experience was not as meaningful as she hoped.

Participants' descriptions provided insight on a common sentiment that virtual labs often resulted in passive interactions. While these passive interactions were thought to limit the depth of their learning experiences, they were noted to have potential to serve as supplemental support for tactile labs rather than standalone learning experiences. Other participants also suggested a mixture of tactile and virtual labs in which the presence of both could supplement one another while not replacing each other. Furthermore, some participants saw potential in virtual labs when used more efficiently as a combination of both virtual and tactile activities. Marisol shared those virtual labs often lacked an important component in constructing meaningful learning experiences. She explained it lacked the ability to "*see it and then do it.*" This further gave insight on potential benefits that students saw in virtual labs. Students saw it as a possibility to use virtual labs to "*see it and then do it*" but they were just not given this opportunity. Marisol shared excitedly that virtual labs could be used as an introduction before tangibly conducting the lab in the classroom. However, her smile faded as she concluded that she did not get to experience those type of labs in science. Similarly, Alejandro suggested that "*... a balance of hands on and technology [would be great] because virtual labs are super boring... teachers might see it as interactive and fun, but they know it already*." This quote was very insightful because Alejandro concluded that he believed his teacher had good intentions in sharing virtual labs that they believed would be engaging. However, he felt his teacher did not consider the students' perspective of being new to the concept and lacking experience when making connections. These descriptions illustrate how students felt regarding the passive and less meaningful experiences they had with virtual labs. Furthermore, participants' descriptions

illustrated that the digital submission of labs were considered an advantage. Gabriel stated "*...I love being able to turn in stuff online, so I don't have to keep track of it on paper but like I still like doing things hands on in the classroom.*" This quote was impactful because of the excitement he shared in turning things in online and doing tactile activities. This also emphasized further the previous finding (Finding 1) in which students prefer tactile activities during class and then submit their work digitally. While participants' descriptions acknowledge the advantages of digital submissions, their desire for tactile activities during class highlights the importance of balancing both modalities for a more holistic and engaging learning experience.

Furthermore, several participants wanted to use paper worksheets and/or tactile manipulatives in comparison to digital versions of it. This further emphasized student desire to blend both tactile and virtual components to better meet their needs. Rosa expressed disappointment based on the abundance of Gizmos (digital simulations) as well as drag and drop slides they experienced rather than tactile activities. Similarly, Alejandro stated that "*...worksheets are better to have on paper so that you don't have to drag stuff around on online worksheets, but submission wise, I prefer submitting it online.*" His face was filled with frustration and exhaustion as he explained how much he disliked having to drag textbooks or pictures around on digital worksheets. However, it was interesting to see his facial expression lighten as he shared that he would enjoy submitting assignments online just not doing the activities online. Another participant, Ramon, shared feelings of frustration due to digital activities being used in the classroom as opposed to tactile activities which added a bigger challenge to an already challenging content area. According to Ramon, "*I'm not good at science in general but then adding, having to move things with my mouse combining that stuff... it was really difficult...not the best.*" As Ramon shared his experience the frustration in his voice was

evidently clear. He often sounded defeated by that course due to content area being a pre-existing challenge for him then combined with technological challenges. Gabriel also expressed feelings of frustration due to his perceived notion that virtual activities often felt like "*busy work*". He wondered if virtual activities may have been used to save money on supplies, because the activities seemed to be more manageable. Similarly, other participants suggested that virtual activities were unengaging due to their lengthy scripts and passive interactions of clicking through. According to Silvia, there were several occasions where she thought to herself "*... this would be … better if it was us actually doing it*", rather than passively clicking through the screen without clear understandings of what she was seeing. Similarly, Marisol illustrated the importance of tactile experiences by stating "*...I want to pick [manipulatives]… count them and separate them like I feel like that would be so much better as a printed picture we could write on or better yet the actual corn [we can move around].*" She then explained that she had a stressful experience with a virtual activity in which she needed to count the kernels on a digital corn. As she told me the story, the tone in her voice made it evident how much the activity bothered her. She found it incredibly difficult to count each kernel from the screen, she wanted the actual corn or a printed picture that she could write on. Marisol's experience illustrates the weight certain tactile components in an activity can have on student engagement and success. Participants' experiences illustrated their strong inclination towards engaging with physical/hands on (tactile) materials rather than solely using digital alternatives as replacements. This highlights the significance of blending both tactile and digital components to establish a balanced learning environment which caters to diverse student needs.

The analysis of interview data illustrates that participants had a perceived notion that digital activities were replacing tactile activities. Student concerns stemmed from diminished

engagement levels during self-paced modules, virtual labs, and digital worksheets, which were used for passive content consumption of digital information. Students felt there was a correlation to these experiences and the decline in the richness of traditional hands-on learning experiences, which was that digital activities were replacing traditional ones. Overall, data synthesized in Finding 2 reveals that when participants felt digital activities were replacing tactile activities, they expressed an increasing desire for tactile activities rather than digital activities. Tactile activities consistently emerged as preference by participants that expressed nostalgia for pre-COVID times when such experiences were more prevalent. Participants' experiences also revealed varying perspectives on the accessibility and challenges of digital reading, with some appreciating it and others preferring printed material. Furthermore, students perceived their current digital "hands-on" experiences as tedious, boring, and less meaningful, leading to a disconnection from lessons. Participants' experiences revealed a desire for teachers to purposefully select digital assignments while allowing the use of paper for quick notes and drafts to supplement one another. This aligns with literature that emphasizes the need for a careful selection of learning tools that personalize learning (Kaur, 2013) rather than solely depending on modality (Picciano, et al., 2021).

Grass is Greener on the Other Side

Finding 1 and Finding 2 synthesize patterns in the data regarding participants' preferences and challenges encountered within their blended learning experiences. Finding 3 aligns to both previous findings by introducing the dimension of diversity in students' experiences within the same campus. This finding echoes the sentiments expressed in Findings 1 and 2, where students are aware of variations in digital experiences among their peers. Furthermore, Finding 3 highlights data that illustrates participants' awareness of the larger

landscape of blended learning resulting in a sense that 'the grass is greener on the other side.' Along with Findings 1 and 2, Finding 3 shines a light on student dissatisfaction of the use of digital elements in blended learning that they perceived as excessive or unnecessary. More distinctly this third finding reveals that participants desired experiences that were meaningful and engaging, which reflected a thoughtful blend of both modalities. This finding also reveals that students are aware of disparities in access to the kind of digital experiences they want. This aligns with literature's (Gorski, 2009; U.S. Department of Education, 2017; Resta, 2018) notion that equal access to technology does not always result in equitable learning opportunities, as students may perceive disparities in instruction.

Participants' experiences revealed that they noted discrepancies in the ways digital elements were experienced within their campus and between their experience of blended learning compared to those distributed across the broader landscape of blended learning. Participants perceived differences such as those regarding the type of digital assignments; the degree of teacher presence, the technological skill of teachers; the ends to which technology was used and the balance of tactile and digital experiences, as discrepancies in classrooms. Ultimately, participants' perceived discrepancies resulted in a "grass is greener on the other side" effect when experiences were shared among their peers. Participants' experiences of blended learning suggested that they often perceived their classrooms as missed opportunities when technology usage was not active resulting in minimal or lack of opportunities for enhancing/applying their digital skills in creative/innovative ways that built high yield digital capital. Participants expressed a perceived notion that technology was underutilized due to digital competencies of teachers and students. In contrast, other participants perceived their classrooms as an overwhelming multitude of apps, learning platforms, virtual labs, and digital worksheets which

felt as if technology had replaced the tactile experience of being in-person. On the other hand, some participants shared positive impacts that selectively crafted opportunities of using both paper based and digital activities in blended learning classrooms had on their lesson engagement and efficiency. Much like the narratives in Finding 1 and 2, Finding 3 narratives reveal a range of student experiences with blended learning, in which one end of the spectrum showed students that felt that technology was underutilized to the other end where students felt overwhelmed by its overuse. This wide spectrum of student experiences highlights the importance of considering not only physical access to ICTs but also the quality and nature of digital learning experiences (Gorski, 2009; U.S. Department of Education, 2017; Resta, 2018). Furthermore, through conversations with peers across classes, participants were aware of the wider landscape of blended learning opportunities that they felt were better than those they experienced and to which they felt they did not have access. This resulted in a reoccurring feeling that 'the grass is greener on the other side' of the landscape of blended learning.

According to Marisol, it would have been beneficial if she was taught *"... things that we actually need to use in school, like how to create stuff for projects, or like typing, or like the different apps and stuff teachers want us to use*." Marisol expressed her frustration as she explained that she didn't feel prepared enough to be digitally creative in any of her classes. Other participants shared how they would have loved to use more digital creativity across classrooms, rather than witnessing several missed opportunities due to the underutilization of technology. Daniela shared her disappointment with not being taught more digital creativity skills to use in and outside of school. Some students theorized that teachers may lack the necessary skills to assign creative digital activities/projects such as making doodle videos, animating their drawings, 3D designs, etc. Rosa shared disappointment towards not knowing how to "... *make*

more creative projects digitally, but I didn't really know... a friend told me she made a cartoon doodle like video for a presentation... that sounded like fun, but I wouldn't even know how to begin." Similarly, Gabriel shared feelings of disappointment due to his perceived notion of missed opportunities to receive digital feedback and actively engage with innovative digital assignments as opposed to passively clicking through assignments. This resonates with the idea presented in literature (Gorski, 2009; U.S. Department of Education, 2017; Resta, 2018) which argues that equal access to technology does not necessarily guarantee equitable access. Gabriel's disappointment reflects a specific instance where access to digital technology alone does not ensure meaningful engagement or equitable learning opportunities. Furthermore, Gabriel's experience highlights the importance of considering not only physical access to ICTs but also the quality and nature of digital learning experiences. Gabriel's perceived missed opportunities indicates a gap between access and utilization of technology for active learning purposes, which aligns with the literature's emphasis on instructional quality based on active or passive content consumption. According to Gabriel, he wanted *"...more creativity... not just click click click on virtual labs but actually create stuff...*." He explained that it would have been nice to be able to add animations to his paintings in art class or perhaps make a film animation his painting as a background. He excitedly added the possibility of transferring his drawings into a 3D draft of a sculpture. However, his excitement quickly vanished as he admitted not knowing if it would even be possible since he was not sure how to do that himself. This was significant because it emphasized the importance of digital capital as discussed by Ragnedda and Ruiu (2020), in which students who possess higher levels of digital competencies navigate blended learning more effectively and derive greater benefits from technology-enhanced learning experiences compared to their peers with limited digital capital. Participants' experiences convey a sense of

unexplored potential and missed opportunities, along with the desire for more innovative and creative digital experiences. Gabriel's desire for more creative digital experiences can also be seen as a desire for experiences that would build his digital capital. In addition to Gabriel, other participants also shared that they would have loved to engage in digital creativity for class projects or game-based learning in their classrooms. Alejandro states "*... it would have been nice to make like a collage or like a video or like something instead of PowerPoint.*" He explained that in his classes it was always the same expectation that projects would be either on a poster board or slideshow unlike his friends in other classes. He would often hear of fun creative ways of presenting projects from other students but lacked the experience himself in any of his courses. This resonated with Kömür, et. al (2023) sentiment of having a holistic approach towards addressing the digital divide by supporting the development of digital skills for all students. The lack of opportunities to develop such skills resulted in Alejandro's perceiving a clear discrepancy between his friends' experience of high-capital, creative digital experiences through which their experiences of blended learning were enriched and his experiences of instead of his own slide- second-string experiences characterized by poster boards and slide-shows According to Isabel, "*...[it] would have been nice if we could have done a video of a historical reenactment, or maybe some kind of animation but we didn't really have those options it was just a PowerPoint presentation...*" She shared that engaging in digital creativity could have provided more meaningful learning in those classes like it did in his other classes. Isabel explained how much fun she had making a digital Rube Goldberg machine for a science project. She made a video from a 3D animation on his computer which was a "*... rendering of me [Isabel] dropping a marble and a bunch of dominoes falling and then it knocks over this thing and then it like flicks a lever... a simulated zombie outside crushed by something... it was fun and*

interesting." It was evident that Isabel enjoyed this activity based on her excitement and brightly lit face, but also that she was very proud of her science project. Participants' experiences illustrated various levels of engagement with digital creativity, but most importantly they showed participants' yearning for digital capital and creative digital opportunities in the classroom. These experiences also illustrated that participants were aware of a more innovative and engaging learning experience beyond their current technological landscape reinforcing the sense that 'the grass is greener on the other side'. Dismayingly, that "other side" was often represented in their experiences as existing within their own campus, just in someone else's classroom.

Participants reported feeling that technology was underutilized in comparison with their own past positive experiences or those discussed by friends. According to Isabel, not all her classes made use of game base learning, instead they used alternative review platforms that were self-paced, which she found disappointing. Game-based learning seemed to be a very important topic for Isabel because she brought it up numerous times and was well versed with the various platforms available. Isabel enthusiastically expressed her desire for more game-based learning experiences, specifically highlighting Kahoot and Blooket as prime examples during multiple interviews. Her excitement was evident as she described Blooket as having *"…a really good reward system...I learned a lot...because you're having fun and it's competitive...it is more of a kind of like a gamified lesson."* This quote highlights Isabel's positive experience with game-based learning platforms. She attributed it to their rewarding nature and competitive elements which enhanced her learning process through gamification. Conversely, she vividly expressed her strong aversion towards IXL as *"…the one that I despise, like with all of my soul [is IXL] ...there is no reward... it's just a percentage, you have to do a lot of questions in a row to be able to like move up."* Isabel's perspective highlight the importance of immediate gratification and

engagement in game-based learning, emphasizing on its positive impact in learning experiences. Gabriel expressed disappointment with not being able to engage in game-based learning opportunities in his classes as he had during emergency learning. Gabriel stated feeling *"... sad because I feel those games help you because you do learn and you're also having fun*." He then added that some teachers would still use it because his friends would tell him about it, but his teachers wouldn't use it in any of his blended learning classes. Similarly, Rosa, was sad when "*...friends would talk about crypto... but none of my teachers did it we would just have like regular online quizze*s." These participants' experiences provided insight on the degree of awareness that students held regarding the wide spectrum of blended learning experiences. On the other hand, nine out of the ten participants shared experiences suggesting that technology was overused in blended learning classes due to teachers being overly ambitious in integrating technology. The perceived notion of technology being overused seemed to stem from the feeling of being overwhelmed by the vast multitude of usage within the same course and at times even in the same class period, resulting in yearning for their friends' blended learning experiences instead of their own. The students' awareness of the diverse range of blended learning experiences, along with their disappointment over missed opportunities or the perceived overuse of technology, collectively contributed to the sense that "the grass is greener." Participants' experiences conveyed that the greener side is one where a more balanced and enriched integration of technology is achieved which further aligns with the notion that equitable access goes beyond mere availability of technology (Gorski, 2009; U.S. Department of Education, 2017; Resta, 2018) to foster meaningful engagement and learning.

This finding's guiding theme of the "grass is greener" phenomenon reveals itself in participants' discussion of discrepancies related to the degree of teacher presence in blended

learning environments. Several participants expressed that the over-reliance on technology was replacing their teacher's presence in the classroom. However, others found accessing digital resources to be a beneficial extension of their teacher's presence outside of the classroom. The contrast in experiences among participants created a perception of a "grass is greener" effect. While some students viewed technology as a hindrance, others saw it as a valuable supplement to their learning. For instance, eight participants' experiences suggested that they perceived the over-usage of technology replaced their teacher's presence in the classroom. According to Alejandro, "*I didn't like [videos]... I feel like I wasn't learning...a whole hour is too much... maybe five minutes*" suggesting that the experience was that of technology being overused. Similarly, Daniela expressed overwhelming concerns that videos were replacing the teacher, suggesting that there was an over-use of videos in the classroom which took away from the teacher's presence in the classroom. Additionally, Ramon shared, "*I can't stare at a computer and learn everything... I have to be actually taught*." This suggests that Ramon felt alone, lacking guidance from a teacher. Ramon then went on to explain *"... if they [teachers] would still teach me in class... a video would help remind me of something that they already thought me in class.*" This quote further illustrates that he was aware of the wide spectrum of blended learning, in which videos could be used as supplemental resources rather than replacements to in class teacher interactions. These experiences collectively conveyed concerns about the excessive reliance on videos, which students felt were replacing the teacher's physical presence in the classroom. Ramon expressed a desire for more engagement with his teacher. Contrastingly, his awareness of the potential role videos many play as supplementary resources further contributes to the collective sense across participants' experiences that the grass may be greener on the side where a more balanced integration of technology exists. Furthermore, two

participants described experiences in which teacher feedback was replaced by programmed feedback, which was less effective since it was generalized and lengthy. Rosa stated that the teacher "*would usually go over the answers with us after we finished answering but it wasn't like he would send us individual comments*." This quote provided insight on her awareness of the wide spectrum of blended learning tools that could be used to provide her more meaningful feedback. Rosa explained further by stating that "*... since we were turning it in online... it would have been nice to see what his thoughts were on what I wrote... I would mainly copy what the reading said...*" She recalled how her writing didn't make much sense to her because she often just tried to turn something in on time. Rosa's narrative provided more insight on the disconnect felt between student-teacher interactions that could make learning more meaningful rather than "busy work" as stated by Gabriel. Several participants suggested they would have preferred personalized teacher feedback to better understand their mistakes and learn from them. The participants' views suggested they perceived their classrooms as overusing or misusing technology to the point that it faded their teacher's presence and underutilized its potential.

According to Marisol, she hoped technology in the classroom could help her get "*...organized and make it fun but at the same time... still have hands on stuff and conversations with teachers*." This further emphasized the important factor teacher presence played in her learning experience and her awareness of the possible blended learning experiences that could use technology while protecting teacher presence. The collective experiences highlight student perceptions that blended learning classrooms are overusing or misusing technology to the extent that it diminishes the teacher's presence while also underutilizing its innovative potential. These experiences align with this finding's emphasize that students perceive the grass is greener when a balanced integration of technology is experienced and when it is not, they feel it. Contrastingly,

other participants shared experiences in which they would access support videos or research them at home to help complete assignments outside of the classroom. Some participants stated that they found it beneficial when teachers would provide support videos or how to videos embedded into the learning platform. For instance, Jose shared teachers would sometimes use *"…Edpuzzle questions during the lecture or videos with questions after."* Daniela shared that she had teachers that would issue Edpuzzle videos, which she found beneficial because *"…we would learn the chunk of it in class and then the Edpuzzle was for homework, so it was like a review or to introduce it…the videos do help, but like if they're more than, like, 10 minutes long then like you lose me."* Similarly, Alejandro expressed excitement in using Edpuzzle as he mentioned that it was more than just watching a video *"…it's like a video [that] can like make sure your answer is actually correct or you have to go back and be like, wait, I need to review that… It does actually help."* Additionally, Isabel stated that she benefited from other learning platforms that had *"... a button that said, I don't understand this... they would do it for you then you would do it with it. It's like a step by step*." The most prominently perceived discrepancies noted by students were surrounding the type of digital assignments and the level of teacher presence across the various degrees of technology usage within blended learning classrooms. Participants' perceptions of blended learning varied. Some viewed their classrooms as missed opportunities in which opportunities to build on digital capital through digital creativity were absent. Others experienced an overwhelming over reliance on technology that replaced their teacher's presence. Some participants expressed disappointment when the teacher's presence was replaced by technology, such as videos or programmed feedback. Other participants experienced blended learning's use of supplemental videos and preprogrammed feedback as extending their teacher's reach.

Summary of Key Findings

The case study found three key findings that resonated with the case study's research question. Finding 1 emphasizes that 'less is more' in blended learning, in regard to the integration of technology, supported by three sub-findings. Participant's experiences illustrated that students appreciate technology but are often filled with frustration due to excessive digital demands. Participant's experiences also demonstrated that students in many ways live the landscape of blended learning through the pedagogical details such as the process for submitting assignments, consistency of digital routine and ease of accessing course materials. These daily details mattered to participants whose narratives revealed they wished such details mattered more to teachers. Finding 2 highlights the value of a balanced integration of digital and traditional modalities that supplement rather than replace. Despite acknowledging digital benefits, participant narratives often revealed a preference for tactile over digital activities because they found current standalone digital experiences as less meaningful. Lastly, Finding 3 builds on the previous findings to show that participants were aware of the rich landscape of blended learning opportunity, yet their own blended learning experiences seemed more frustrating than enriching. This discrepancy between the high digital capital, creative digital experiences they heard from friends or experienced in other settings and their own current blended learning experiences characterized by PowerPoints and posterboards, gave rise to a sense among participants that the blended learning 'grass is greener' on the other side. Discrepancies in digital assignments and teacher presence contributed to this phenomenon which seemed particularly critical to participants whose narrative's expressed a clear desire for more digital creativity opportunities. The findings highlight the complex relationship between students' experiences in blended learning, their needs in technology integration, and the potential issues related to digital equity.

CHAPTER V

SIGNIFICANCE OF FINDINGS

Many historical events over the past three decades have changed the face of education, but according to Hodges et al. (2020), the most unique changes in US education were those ignited by COVID-19. While K-12 online learning did not originate at this point in history, many K-12 educators, students, and families have marked the 2019-2020 school year as the year school closures and emergency learning became a reality. Literature such as Novak and Tucker, (2021) and the Department of Education (2024), along with others (Jones & Sharma, 2020; Hodges et al., 2020; Singh et al., 2021) predicts that the increased reliance on educational technology will remain in the post-COVID era. Using a digital equity lens, this case study explored students' experiences navigating local landscapes of blended learning in post emergency learning. This chapter discusses the case study's significance in relation to the research question, implications for practice and areas for further research. The case study's findings emphasize the need for simplicity, balance, and equity. These insights help inform the design and implementation of blended learning practices aimed at providing engaging, flexible, and equitable learning experience for all students within blended learning environments.

Significance to the Research Question

Chapter IV provided narratives that lent insight into this case study's guiding question which was: How did 12th grade students, within the same public school in lower south Texas, experience blended learning in post emergency learning? The findings collectively call for a

'less is more' approach to technology integration, in which digital elements supplement rather than replace traditional tactile methods, in ways that build high yield digital capital. This highlights the need for digital literacy skills that build high yield capital and the need for equitable access to digital resources and support systems. Moreover, these insights highlight the diversity of students' experiences in navigating blended learning, emphasizing the need for flexible approaches to meet individual needs and promote digital equity. The significance of this case study's findings resonates across multiple levels of insight that enhance our understanding of blended learning while also emphasizing the importance of addressing issues related to digital equity in educational contexts, as illustrated in Figure 8.

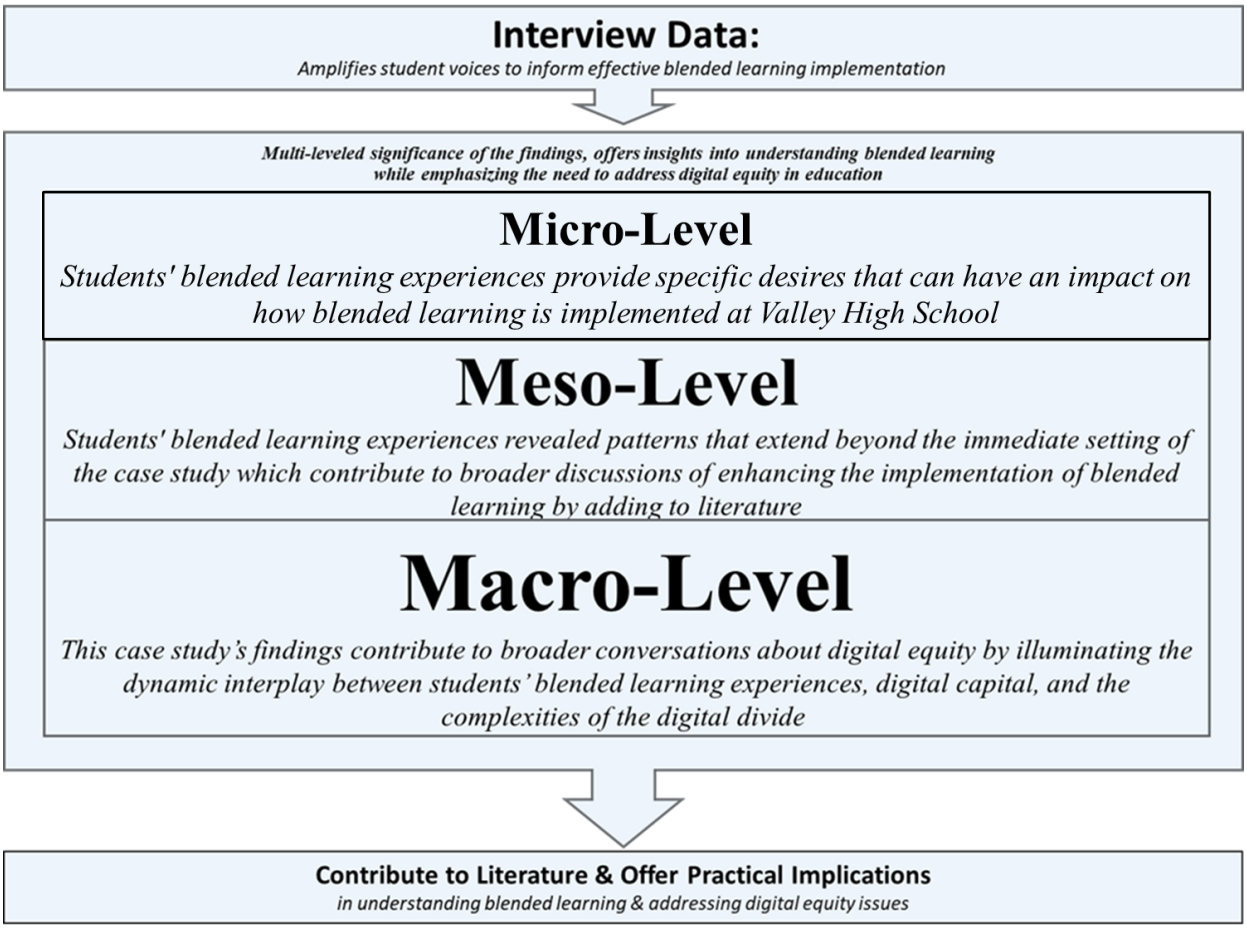


Figure 8: Multi-level Significance

Towards these ends the discussion of the findings' significance is divided into two parts, 'Understanding Blended Learning' and 'Blended Learning with Digital Equity', which illustrate insight across multiple levels of the case study. The first part of this section provides insight into an understanding of the blended learning landscape at the micro-level of the case study, as illustrated in Figure 8. Additionally, this part also shines light on the meso-level (Figure 8) insights that might be gathered regarding the larger landscape of blended learning which extends beyond the bounded time and place of this exploratory case study. The second part of this section provides insights on how participant experiences discussed in Chapter IV relate to macro-level (Figure 8) issues of digital equity within blended learning landscapes.

Understanding Blended Learning

The findings from this case study offer insights into understanding the blended learning landscape at the micro-level. By examining the experiences and perspectives of participants within the specific context of this case study, we gain a deeper understanding of how blended learning operates within Valley High School. While the case study's scope is limited to ten participants, their detailed accounts provide vital insights into the complexities of navigating technology within Valley High School's blended learning environment. For example, we uncover the needs, challenges, and attitudes of students towards digital and tactile activities, as well as the effectiveness of different instructional models, and the impact of technology integration on student engagement and learning outcomes. These micro-level insights provide a comprehensive view of the dynamics and intricacies of blended learning within the confines of specific classrooms and/or school environment at Valley High School.

A micro-level significance of this case study lies in Finding 1, which unveiled the multifaceted challenges encountered by students with blended learning at Valley High School,

particularly concerning the incorporation of computer-mediated components using a 'less is more' approach. While the case study's scope is limited to ten participants and cannot be generalized to all students or even all students within Valley High School, participants detailed accounts provide valuable insights into the intricacies of navigating technology within the Valley High School's blended learning environments. Finding 1 provides a micro-level insight into students' needs for accessible digital content and the importance of a simplified approach to blended learning. The finding highlights the micro-level impact of technology integration among individual learning experiences within Valley High School by highlighting the students' struggles with managing multiple digital platforms simultaneously that resulted in cognitive overload. Additionally, the sub-findings further explain the significance of adopting a simplified approach to technology use, emphasizing its role in alleviating frustration, promoting stability, and enhancing access to digital content. Student desires to access assignments via digital calendars and engage in paper completion of assignments followed by digital submissions aligns practically with the needs of Valley High School students, potentially facilitating a smoother transition into the blended learning landscape. The sub-findings highlight students' frustrations with specific challenges such as submitting and accessing digital content, emphasizing the significance of well-organized digital infrastructures in supporting a seamless learning experience. These insights shine light on the specific challenges encountered by students within Valley High School's blended learning environment, emphasizing the need for flexibility and user-friendly interfaces to enhance their learning experiences. Another micro-level significance of this case study is highlighted by Finding 2, which emphasizes a balance between digital and tactile elements within blended learning at Valley High School. Furthermore, the participants expressed concerns about the potential replacement of hands-on tactile experiences with digital

assignments. These narratives emphasized a perceived distinction between digital and tactile activities, with many expressed nostalgias for pre-COVID times when more tactile activities were prevalent. Finding 2 revealed that while digital reading and writing offer certain conveniences, such as accessibility and lightweight devices, participants also expressed a desire for printed material and handwritten work for increased meaningful learning opportunities. Moreover, participants expressed frustrations with digital activities, citing issues such as eye strain, digital distractions, and a lack of engagement compared to tactile experiences. This case study also highlighted students' preferences for a balanced approach to technology integration, where tactile and digital activities complement each other rather than act as replacements. Participants suggested a blend of tactile and digital writing opportunities, expressing a desire for teachers to purposefully select digital assignments while allowing the use of paper for quick notes and drafts. This finding highlights the importance of a balanced integration of tactile and digital modalities within blended learning environments to ensure meaningful engagement for all students, particularly those with diverse learning styles and varying levels of digital literacy. Ultimately, navigating this balance is crucial for enhancing the overall educational experience and addressing issues related to digital equity at Valley High School. Furthermore, another micro-level significance of this case study is evident from Finding 3 which emphasis on student perceptions of ‘grass is greener’ notions sparked by variations in students' experiences with blended learning within the same school context. The detail rich narratives provide insights into specific aspects of blended learning design and pedagogy at Valley High School. This finding highlights the diversity in students' experiences across blended learning environments by shining a light on participants’ awareness of disparities which may have contributed to their perceptions of technology serving as the replacement for in-person tactile experiences. Participants expressed

a sense of dissatisfaction with the exclusive use of digital modalities, emphasizing the need for supplementing rather than replacing tactile activities. Furthermore, the finding raises questions about the role of hands-on experiences and the capacity of teachers to organize meaningful digital experiences that build on students' digital capital. These insights offer a springboard for discussions at the campus and district levels regarding the design and pedagogy of blended learning, with a focus on enhancing student engagement and fostering equitable learning opportunities. This finding highlights the importance of considering not only physical access to technology but also the quality and nature of digital learning experiences in shaping students' educational journeys at the micro-level's confines of Valley High School. Overall, at the micro-level, these insights offer a granular understanding of the challenges that students encounter daily, informing targeted interventions and adjustments to improve the blended learning experience within the specific context of Valley High School. Beyond the bounded time and place of this exploratory case study, the findings also offer insights into the broader landscape of blended learning at the meso-level. We can identify broader trends, patterns, and implications that extend beyond the immediate setting of this case study by extrapolating insights from these findings. We can examine how the student needs and challenges identified among participants in this case study may reflect larger trends or issues within the field of blended learning across different educational institutions or settings. Furthermore, the meso-level insights derived from this case study's exploration of students' blended learning experiences can inform our understanding of the evolving nature of blended learning practices, the effectiveness of various instructional approaches, and the impact of technology integration on teaching and learning outcomes on a larger scale.

The meso-level significance of Finding 1 lies in its implications for curriculum designs and pedagogical practices within Valley High School, as well as similar educational contexts. This finding provides valuable insights that can inform decision-making at the institutional level by revealing student needs and challenges regarding the integration of computer-mediated components. This section shines light on the significance of Findings 1 and 2, with insights they lend within the context of blended learning literature, particularly focusing on how students experience this educational model. As Chapter IV, findings detail that participants experience blended learning in a variety of ways, their experiences reveal patterns. Overall, participants in this case study revealed a feeling of being overwhelmed by a barrage of digital demands that did not build their digital capital. Furthermore, the lack of attention to key pedagogical details addressed in sub-findings 1a, 1b and 1c amplified this frustration. Finding 1 emphasizes the effectiveness of adopting a 'less is more' approach in technology integration which aligns seamlessly with key principles outlined in blended learning literature. For instance, the emphasis placed on simplified digital assignments, predictable routines, and accessible content echoes existing research that advocated for user-friendly interfaces and cohesive digital infrastructures (Kaur, 2013). Specifically, the emphasis that establishing predictable routines with computer-mediated components positively impacts student engagement resonates with the literature's call for a careful selection of learning tools to personalize learning (Kaur, 2013). Furthermore, the challenges posed by excessive digital demands, including the struggle with different computer-mediated components within the same class, align with the literature's emphasis on thoughtful consideration of pedagogical layers in blended learning (Picciano et al., 2021). Moreover, it also aligns with the importance of adopting a strategic approach to incorporating technology in recognition of the potential cognitive overload that may result from excessive digital demands as

suggested by Nong, et. al (2023). This further aligns with the "less is more" finding that highlights the effectiveness of reducing cognitive load by streamlining the use of computer-mediated components in blended learning environments. This not only enhances student engagement but also mitigates cognitive overload, a crucial consideration highlighted by Nong et al. (2023). Therefore, educators can create more engaging and effective learning experiences for students in blended learning settings by heeding this finding's emphasis on thoughtful pedagogical design and implementing strategies to mitigate excessive digital demands. Furthermore, the finding reiterates the need for well-organized blended learning environments to avoid negative attitudes and ensure productive use of class time, in harmony with recommendations for a flexible yet structured learning environment (Jakobsen & Knetemann, 2017; Novak & Tucker, 2021). This is significant because it highlights the importance of flexibility in navigating the blended learning environment to meet the diverse needs of students. Consistency in implementing technology to enhance student engagement, as emphasized in this case study, echoes the literature's call for a structured learning environment (Jakobsen & Knetemann, 2017; Novak & Tucker, 2021). Participant narratives that describe frustrations arising from abrupt changes and a lack of careful planning, highlight the need for a sense of structure and consistent use of technology to enhance the overall learning experience, as suggested by Jakobsen and Knetemann (2017). These frustrations also align with a sub-theme noted by Jakobsen and Knetemann (2017) about flipped classroom (a type of blended learning model) appearing disorganized to some students. This is significant because students desire predictable routines to aid during an adjustment period experienced at the beginning of blended learning environments, as similarly illustrated by literature regarding flipped classroom (Barkley, 2015). The struggle with frequent changes in technology platforms was highlighted across

participant narratives. Students also express nostalgia for the pre-COVID era, where clear routines were followed. Moreover, this finding emphasizes the need for careful selection of technology and the establishment of consistent routines, particularly in the significance of sticking with the selected technology long enough to become proficient and build digital capital. Finding 1 also sheds light on students' desires for accessible digital content, emphasizing the significance of a simplified approach. The identified frustrations, such as difficulties in figuring out digital assignment due dates and accessing files, align with literature suggesting that students develop negative feelings due to increased workloads outside of the class (Zafar, 2016; Gomez-Lanier, 2018). Participant narratives about the importance of using a single calendar view and the struggles faced when navigating through multiple windows resonate with literature that highlight the significance of user-friendly interfaces (Kaur, 2013). Concerns expressed about the disorganization of digital files and multiple platforms for storage align with the literature's recognition of the crucial role of a well-organized digital infrastructure in providing students with a seamless learning experience. These challenges echo broader issues related to student motivation, workload, and structural considerations acknowledged in the literature (Gomez-Lanier, 2018; Jakobsen & Knetemann, 2017). Finding 1 resonates with blended learning literature such Barkley (2015), which emphasizes the critical role of a 'less is more' approach in enhancing the effectiveness and positive outcomes of blended learning environments, but from a high school student’s perspective. By prioritizing simplicity and consistency, educators can create more engaging and effective learning experiences for all students, fostering a smoother navigation of blended learning environments. Overall, the significance of this finding is its emphasis on the importance of flexibility in meeting the diverse needs of students, as well as the significance of well-organized digital infrastructures that foster a seamless learning experience.

Key takeaways from Finding 1 are that navigating blended learning becomes smoother when a simplified approach to digital assignments is experienced and when students can anticipate/adapt to consistent computer-mediated practices. However, navigating blended learning becomes more challenging when content is disorganized or inefficiently presented. This finding is significant for its alignment and contribution to established literature while also offering practical implications for educators by highlighting the critical importance of adopting a "less is more" approach in blended learning environments to enhance student engagement, mitigate cognitive overload, and promote a more effective learning experience overall.

The meso-level significance of Finding 2 lies in its contribution to broader discussions surrounding students' experiences of blended learning. While the data collected in this case study are specific to Valley High School and its unique context, the findings resonate with larger themes and challenges in the realm of blended learning. The case study highlights the importance of considering diverse learning modalities in the design and implementation of blended learning initiatives by illuminating students' strong preference for tactile experiences and their concerns about the potential displacement of these experiences by digital activities. For instance, participants shared a desire for the integration of computer-mediated components to be not only simplified but also a balanced approach to digital and tactile activities, which holds significant implications within the broader context of blended learning literature. This offers valuable insights into students' needs and challenges in navigating these modalities. Participant narratives from Chapter IV illustrate that tactile were a common thread among participants' more positive blended learning experiences. This aligns with literature that advocates for blended learning models combining tactile in-class and at home digital experiences to optimize learning outcomes (Barkley, 2015; Tsai et al., 2015; Gomez-Lanier, 2018). This finding is particularly important

because students perceive digital activities as potentially replacing hands-on experiences which reinforces their preference for tactile activities. Participant narratives vividly illustrated the importance of tactile activities in their blended learning experiences, aligning with literature advocating for a combination of tactile in-class experiences and digital assignments to optimize learning outcomes. This finding is particularly crucial as it addresses students' concerns about the potential replacement of hands-on experiences by digital activities, highlighting the preference for tactile engagement. Moreover, the desire for purposefully selected digital assignments alongside paper-based tasks emphasizes the need for personalized learning tools, aligning with existing literature stressing the importance of pedagogical considerations in blended learning environments. Participant narratives revealed a desire for teachers to purposefully select digital assignments while allowing the use of paper for quick notes and drafts. This aligns with literature that emphasizes the need for a careful selection of learning tools that personalize learning (Kaur, 2013) rather than solely depending on modality (Picciano, et al., 2021). Moreover, the positive perspective observed when students engaged in tactile activities, coupled with digital submissions, resonates with literature that emphasized benefits of blended learning models to promote active hands-on activities in class and assign video lectures outside (Barkley, 2015; Leo & Puzio, 2016; Tsai et al., 2015; Gomez-Lanier, 2018). This case study also highlights the variability in students' experiences with digital and tactile formats across classrooms, aligning with the consideration of a spectrum of blended learning instructional models (Novak & Tucker, 2021). Challenges faced, such as difficulty interacting with PDFs and frustrations with online activities, echo concerns raised in the literature regarding standardized digital expectations and their impact on preferred learning processes. Participant narratives expressing concerns about engagement, meaningful learning, and the potential negative impact on physical well-being when

using computer-mediated components align with existing literature highlighting these challenges in blended learning (Gomez-Lanier, 2018). The frustration expressed regarding receiving less meaningful learning when using computer-mediated components, as opposed to teacher-led instruction, resonates with issues noted in the literature where students feel content is discussed superficially with limited explanation (Jakobsen & Knetemann, 2017) without instructor lectures (Gomez-Lanier, 2018). Students' preference for tactile experiences and dissatisfaction with digital "hands-on" activities also align with the literature, suggesting that active learning for all students doesn't automatically translate from the intention of active learning (Bergdahl & Bond, 2022). The students' preferences and challenges related to tactile and digital activities further align with the variability observed in blended learning models emphasizing the importance of considering the pedagogical layer in blended learning research (Picciano et al., 2021; Bergdahl & Bond, 2022). Participant narratives, expressing dissatisfaction with virtual labs and manipulatives, underscore the need for a balanced integration of tactile and digital activities, resonating with Novak and Tucker's (2021) post-pandemic vision for teaching and learning. The case study's insights complement Picciano et al.'s (2021) perspective by providing a rich understanding of the pedagogical stories told through student perspectives and bridging the gap in understanding how students experience blended learning. Finding 2 is most significant for emphasizing the importance of a balanced integration of tactile and digital activities to address students' preferences, promote engagement, and enhance effectiveness of blended learning environments. Furthermore, the incorporation of a balance between tactile and carefully selected digital elements is imperative to address issues of digital equity by providing flexible settings to meet the diverse needs of all students. Issues related to digital equity were noted when activity selections leaned too heavily towards digital. This would give a disadvantage to students with

limited EdTech skills and tactile learning preferences. There were two key takeaways from Finding 2: Students enjoy navigating blended learning when they engage in tactile activities during class and then submitted work digitally; Students blended learning experiences were smoother when a balance between tactile and digital existed in which digital activities supplemented but not replaced traditional tactile activities. Navigating this balance is crucial for ensuring that students with diverse levels of digital literacy skills and needs can fully engage in a more meaningful learning experience. This case study provides valuable insights into the diverse experiences of students with digital and tactile modalities which reflects Novak and Tucker's (2021) recognition of a spectrum of instructional models within blended learning. Participant narratives revealed students' needs and challenges, related to digital and tactile activities, which align with existing literature's acknowledgment of issues such as student motivation, workload, and structural considerations in blended learning (Gomez-Lanier, 2018; Jakobsen & Knetemann, 2017). Participants' enjoyment and smoother navigation of blended learning environments when experiencing this balance highlighted its significance in ensuring a more meaningful learning experience for all students. Educators can address concerns raised in the literature regarding student motivation, workload, and structural considerations within blended learning contexts by navigating this balance between digital and tactile modalities. The connection between Finding 1 and 2 provides a more comprehensive understanding of how students experience blended learning at Valley High School. For instance, Finding 1a emphasizes students' appreciation for a blended learning approach which aligns with Finding 2, where concerns are expressed about the potential replacement of tactile activities by digital ones. The preference for a balanced approach becomes clear as participants stress the importance of tactile learning experiences, such as handwritten assignments, reading printed material, using physical manipulatives with their

hands, and conducting labs with actual tangible classroom items. This aligns with their concerns about the perceived replacement of tactile activities by digital ones. Additionally, Finding 1b stressed the need for predictability in technology use which aligns with the concerns raised in Finding 2 in which participants expressed nostalgia for the pre-COVID era when clear routines, including regular tactile activities, were followed. The desire for predictability in both digital and tactile aspects of learning is a common thread. Furthermore, Finding 1c highlights participants' frustration with disorganized digital content and their preference for a 'less is more' approach in accessing information. This aligns with Finding 2 as students perceived the excessive use of digital activities as replacements of hands-on experiences. Together, these insights contribute to a more comprehensive understanding of blended learning and its implications for teaching and learning in modernized educational settings. For instance, Finding 1 and 2 align with blended learning literature in the emphasis of following a 'less is more' approach, the importance of consistent digital routines, and the value of a balanced blend of digital and tactile activities that supplement but not replace. Understanding students' preferences in technology integration (Finding 1) is significant because it informs educators about the types of digital tools and activities that most effectively engage students. This knowledge can help educators tailor their instructional approaches to better meet students' needs to ultimately enhance student engagement and learning outcomes. The emphasis on balancing digital and tactile activities (Finding 2) is significant because it highlights the importance of providing diverse learning experiences that foster flexibility to meet the diverse needs of students. Educators can create a more inclusive learning environment that accommodates the needs of all students, regardless of their technological proficiency or access to digital resources by integrating both digital and tactile activities. The insights provided by participant narratives contribute valuable perspectives to the

ongoing discourse in blended learning research, emphasizing the need for careful planning, structured environments, and a flexible yet balanced approach to enhance high school students' educational experiences. Furthermore, this case study builds on literature by offering insights into how these student needs work in tandem with pedagogical details in ways that color students experience of blended learning and work to both constrain and promote students' access to digital capital.

The meso-level significance of Finding 3 lies in its contribution to broader discussions surrounding students' experiences with blended learning and the quest for greater equity in educational settings. Interestingly, I initially used Novak and Tucker's (2021) updated definition of blended learning to think about blended learning at Valley High School, however upon completing interviews, participant narratives seemed to reveal a landscape of blended learning that more closely resembled Graham's (2006) simplified definition of blending face-to-face with computer-mediated instruction and Novak and Tucker's (2021) description of technology-rich environments. While Graham's (2006) definition implies a balanced integration of face-to-face and computer-mediated instruction, the participant narratives in Finding 3 suggest that this balance might not be consistently achieved across the blended learning landscape. The disparities in computer-mediated and face-to-face instruction levels, as revealed in the participant narratives, draw attention to potential issues related to digital equity. Some students may be exposed to more digital opportunities, while others may have limited access, leading to a perceived notion of inequities across educational experiences. While the case study grounds the data within the specific context of Valley High School, the findings extend beyond this particular educational time and place. The case study prompts larger discussions on how to enhance equity and effectiveness of blended learning initiatives by shining a light on the variations in students'

blended learning experiences and their perceptions of technology integration. The insights gathered from this case study serve as valuable reference points for educators, policymakers, and researchers grappling with the complexities of implementing blended learning models in diverse school environments. The findings contribute to ongoing efforts to optimize blended learning practices and ensure equitable educational opportunities for all students by addressing issues such as disparities in instructional quality, access to meaningful digital experiences, and the balance between technology and tactile learning modalities. Thus, the meso-level significance of Finding 3 lies in its relevance to broader initiatives aimed at improving students' experiences with blended learning and advancing educational equity on a larger scale.

In summary, this section offers a comprehensive understanding of blended learning at both the micro and meso levels within the context of Valley High School. At the micro-level, the findings offer insights into the specific challenges and preferences students encounter within the blended learning environment at Valley High School. These insights provide specific student needs that can have an impact on how blended learning is implemented at Valley High School which includes: a simplified approach to submitting assignments, consistent use of digital resources & clear accessibility to digital content; digital activities to supplement and not replace tactile activities; digital experiences that provide opportunities for content creation and active meaningful engagement. At the meso-level, students' blended learning experiences revealed patterns that extend beyond the immediate setting of the case study which contribute to broader discussions of enhancing the implementation of blended learning by adding to literature. The diversity in students' experiences provides insights when considering the pedagogical layer in blended learning, as similarly suggested by literature (Barkley, 2015; Jakobsen & Knetemann 2017; Novak & Tucker, 2021; Picciano et al., 2021; Bergdahl & Bond, 2022). Purposefully

selecting digital assignments that allows for flexibility, aligns with literature's emphasis for careful selection of learning tools that personalize learning (Kaur, 2013; Barkley, 2015; Leo & Puzio, 2016; Tsai et al., 2015; Jakobsen & Knetemann, 2017; Gomez-Lanier, 2018) rather than solely depending on modality (Picciano, et al., 2021). While Novak and Tucker's (2021) post-pandemic definition of blended learning was used to think about blended learning at Valley High School, upon completing interviews, data revealed an unevenly distributed landscape of blended learning. Some experiences resembled Graham's (2006) simplified definition of blending face-to-face with computer-mediated instruction. Others resembled technology-rich environments, where digital resources are available but not fully integrated into the curriculum as described by Novak and Tucker's (2021). Feeling of being overwhelmed by a barrage of digital demands that did not build their digital capital and the lack of attention to key pedagogical details addressed in these findings amplified frustration, which aligns with literature (Kaur 2013, Zafar, 2016; Jakobsen and Knetemann, 2017; Gomez-Lanier, 2018; Nong, et. al, 2023) Overall, this section provides an understanding of blended learning at micro and meso levels, offering valuable insights for enhancing teaching and learning practices in modernized educational environments.

Blended Learning with Digital Equity

The case study's findings at Valley High School also contribute to broader conversations about digital equity by illuminating the dynamic interplay between students' experiences with blended learning, digital capital, and the digital divide. The case study's findings offer insights into how students experience issues of digital equity within the particular landscape of blended learning at Valley High School. This highlights the need for an understanding of issues and targeted interventions to ensure inclusive educational experiences for all students. Stakeholders may develop more targeted interventions and policies to promote digital equity, to ensure that all

students have fair opportunities to succeed in digital learning environments by understanding these dynamics at the macro level.

The significance of Finding 1 extends beyond micro-level insights to address macro-level issues concerning the digital skills necessary to navigate computer mediated components. Participants expressed challenges associated with managing multiple computer-mediated components which emphasized the need for digital literacy and proficiency in order for students to effectively engage with digital tools. Moreover, these challenges also highlight the disparities in digital access and proficiency that exist among student populations. Students from disadvantaged backgrounds as seen at Valley High School, may face additional challenges in navigating digital environments within blended learning which may exacerbate existing inequities across educational outcomes. Furthermore, the frustration expressed by students due to inconsistent computer-mediated routines aligns with the notion presented by Gorski (2005) and Resta et al. (2018) that the digital divide involves multiple levels. While the first level focuses on physical access, the second and third levels pertain to various uses of information and communication technologies (ICT) and the outcomes arising from ICT usage, respectively. Additionally, literature argues that equal access does not translate to equitable access (Moldavan, et al., 2022), and warns about the digital use divide (U.S. Department of Education, 2017), which emphasizes the need for thoughtful intervention and attention to how technology is used for learning (Resta et al., 2018; Gorski 2009). Students' desire for clear standardized accessibility to digital content reflects the literature's emphasis on the importance of organized and efficient access to digital content (Resta et al., 2018). While Resta et al. (2018) emphasizes the importance of organized and efficient access to digital content, Moldavan, Capraro, et al. (2021) argue that equitable access is crucial for moving away from the digital divide. Additionally, the

preference for completing assignments on paper and submitting them digitally reflects the students' accumulated digital competence. The ability to submit assignments digitally is seen as a flexible and advantageous use of digital technology. However, some participant narratives highlight the complexities of submitting assignments digitally, including challenges related to uploading pictures and navigating multiple computer-mediated components. This aligns with Ragnedda and Ruiu's (2020) idea that digital capital can be leveraged for self-improvement while also creating distinct forms of hierarchies and power. The accumulation of digital capital is seen as a resource that can be converted into other forms of capital, emphasizing the importance of not only physical access but also the ability to use digital resources effectively. Finding 1 calls for recognizing the impact that the digital use divide, as described by Department of Education (2024), has on students' experiences with blended learning by placing attention to targeted interventions and support mechanisms that address the digital use gap as means of ensuring that all students have equitable opportunities to succeed in digital learning environments. The finding promotes the development of digital capital, by advocating for a 'less is more' approach to technology integration to provide students with opportunities to focus on mastering a select set of digital skills rather than being overwhelmed with an array of platforms and tools. Additionally, Finding 1 seeks to mitigate barriers to digital access and promote inclusivity in digital learning experiences by advocating for a simplified and thoughtful integration of technology. Finding 1 advocates for a 'less is more' approach to technology integration, which holds macro-level significance as it promotes digital equity by mitigating disparities in access to and proficiency with technology through the development of digital literacy skills that build digital capital. These insights have broader implications for educational policymakers,

practitioners, and stakeholders in their efforts to promote equitable and inclusive digital learning environments.

The significance of Finding 2's emphasis on balancing digital and tactile experiences extends beyond micro-level insights to address macro-level issues related to digital equity with its potential challenge of achieving a consistently balanced integration that supplements but does not replace. Literature supports the importance of addressing digital inequities and ensuring access to high-quality educational experiences (Novak & Tucker, 2021). The case study's identification of diverse blended learning experiences aligns with the literature advocating for a learner-centered approach and recognizing the need for deeper insights into the pedagogical aspects of blended learning. This aligns with the literature's emphasis on a learner-centered approach and the importance of addressing digital inequities (Novak & Tucker, 2021). The case study's focus on students' desire for tactile activities over digital ones contributes to the discourse on digital equity. For instance, by expressing a strong inclination towards engaging with physical/hands-on (tactile) materials over digital alternatives, students reveal a potential gap in their digital capital, which could impact their ability to fully benefit from digital environments. The finding also highlighted disparities related to the physical impact of technology, while some students expressed preferences for digital reading and writing as it was more portable and accessible due to its lightweight nature, others highlighted challenges such as eye strain, digital distractions, and a lack of engagement compared to tactile experiences. Furthermore, digital inequities may also be seen with students that enjoyed reading digitally due to their access to lightweight devices that provide convenience in its compactness, however others may not enjoy this modality due to barriers they may face such as limited access to lightweight technology or unreliable internet connections. The discrepancies in experiences highlight the need for equitable

access to digital resources and support systems to ensure all students can effectively participate in blended learning environments.

Additionally, participant narratives reveal a diverse landscape of digital equity in the context of blended learning, which extends beyond access to information and communication technologies (ICTs) and contributes to societal inequities (U.S. Department of Education, 2017; Ragnedda & Ruiu, 2020; Resta et al., 2018). The literature suggests that those with higher digital capital may have advantages in societal placement. Finding 3 extends beyond micro-level insights to address macro-level issues related to digital equity by shining light on the disparities in students' blended learning experiences within Valley High School. For instance, students' awareness of the varying degrees of technology integration and their perceptions of 'the grass is greener on the other side' highlight the existence of a digital divide, where some students may have access to more innovative and engaging digital learning experiences than others. This resonates with the Department of Education (2024) distinctions between the types of digital divide. Furthermore, the students' awareness of diverse digital experiences contributes to the "grass is greener" phenomenon which aligns with Moldavan, Capraro, et al.'s (2021) argument that viewing the digital divide through the lens of equity is essential. Participant narratives regarding findings 1 and 2 provide important insight into student preferences and how they shape their experience of blended learning. Finding 3, on the other hand, reveals a profound desire, that runs deeper than preference, to engage creatively with technology in ways that literature such as Department of Education (2024) categorize as active use of technology and that Ragnedda and Ruiu (2020) suggests build digital capital. Students who possess higher levels of digital competencies are more effectively able to navigate and derive benefits from blended learning experiences compared to their peers with limited digital capital. Participants'

experiences revealed a desire for more opportunities active use of technology such as digital project-making and game-based learning which build high yield digital capital. This emphasis on digital creativity skills aligns with broader discussions on digital equity, as it recognizes the significance of providing all students with equitable opportunities to develop essential digital competencies regardless of their socioeconomic background or prior digital experiences. Ragnedda and Ruiu (2020) highlight how digital capital can be transformed or transferred into other forms of capital, in the context of blended learning, students' digital competencies may contribute to their academic success, social interactions, and future career prospects. Thus, the identified diversity in students' experiences across blended learning classrooms highlights the need for educators to recognize and tailor their approach to best meet individual student preferences. Addressing digital equity concerns (Finding 3) is crucial for ensuring all students have equitable access to technology and opportunities for learning. This finding highlights the disparities in digital access and proficiency among students which emphasizes the need for targeted interventions to address these disparities. Educators can create a more equitable learning environment where all students have the resources and support, they need to succeed blended learning landscapes by promoting digital equity. The diversity in students' experiences across blended learning classrooms challenges the notion of one-size-fits-all solutions. This emphasizes the importance of flexibility and student control in blended learning environments, aligning with the literature advocating for a learner-centered approach (Novak & Tucker, 2021) and that this is a cornerstone of digital equity. Finding 3 highlights the importance of designing blended learning environments that consider students' diverse needs and digital competencies by leveraging technology strategically and equitably. For instance, educators can empower learners to build digital capital and invest it in ways that promote positive learning outcomes and bridge

gaps in digital equity, as suggested by U.S. Department of Education (2017). This finding highlights how student awareness of discrepancies in digital learning experiences across classrooms contributes to a perception of inequity. This awareness equips students to express a desire for balanced and innovative digital activities that build digital competencies to foster digital creativity as well as proficiency, which aligns with Ragnedda and Ruiu (2020) notion of digital capital. Furthermore, students who have accumulated higher levels of digital competencies may be better equipped to navigate and engage with the technology-rich aspects of blended learning. Conversely, students with limited digital competencies may struggle to fully participate in and benefit from these environments. Therefore, the lack of guidance for engaging in innovative digital activities and disparities in teacher readiness further impede digital equity. This case study's findings emphasize the importance of addressing issues related to digital equity placing focus on blended learning complexities such as flexibility, predictability, and a balance between tactile and virtual modalities. Students' desire for a "less is more" approach in technology integration resonates with Resta et al.'s (2018) breakdown of the five dimensions of digital equity. Students' frustration with excessive digital demands resonates with digital equity in which digital access is more than physical access to devices and connectivity. The case study's findings emphasize the importance of meaningful content and access to educators with proficiency in digital tools. This aligns with Williems's (2019) exploration of providing support to staff through capacity building to address digital equity as a social justice issue. This suggests an increase in technological empowerment among staff may address digital inequities experienced across participant narratives. Moreover, findings 2 and 3 both highlight how the lack of guidance for engaging in innovative digital activities and disparities in teacher readiness further impede digital equity. These disparities resonate with literature's distinction between

active and passive content consumption, as highlighted by the U.S. Department of Education (2017, 2024), which offers insights on how some students may be limited to passive content consumption, despite increases in access to ICTs in schools. This significantly contributes to literature by illustrating that access to ICTs has increased in schools which has ameliorated the digital access divide but not necessarily addressed the digital use divide as literature cautioned (U.S. Department of Education, 2024). These discrepancies in digital experiences, as illustrated collectively in all three findings, stemmed from the blend of computer-mediated and face-to-face instructional components, echoing Graham's (2006) simplified definition of blended learning as stated in Chapter 2. Interestingly, their experiences also resonate with Novak and Tucker's (2021) distinction between technology-rich environments and blended learning. While some student experiences suggested the implementation of rotational models as described by literature (Staker & Horn, 2012; Graham, 2006), others aligned more closely with a technology-rich learning environment as opposed to a student-centered blended learning environment as described by Novak and Tucker (2021). Furthermore, the case study uncovered a shift towards activity and course level blending resulting in diverse experiences across blended learning classrooms. This is significant because it illustrates a blurred line between classrooms being technology-rich environments or blended learning, and possibly being both in some form. The macro-level significance of this distinction lies in the broader context of digital equity as it reflects the varied experiences students may encounter across educational settings, meaning that not all classrooms that offer digital tools and resources may necessarily provide a fully integrated blended learning experience. Some classrooms may lean more towards technology-rich environments in which digital resources are available but may not be fully integrated into the curriculum with student-centered intentions. On the other hand, some classrooms may lean more

towards blended learning environments that aim for a more balanced integration of face-to-face instruction with computer-mediated activities that are focused on personalized and student-driven learning experiences. Insight is gained on potential disparities in access to meaningful digital learning experiences in terms of digital equity by understanding this distinction. This may be the case in classrooms where technology is merely available without being effectively integrated into the curriculum, resulting in inequitable opportunities to develop essential digital literacy skills that build digital capital. Furthermore, this could exacerbate existing inequalities, as students from more privileged backgrounds or with greater access to technology-rich environments may have an advantage over their peers in acquiring digital skills and knowledge. Ultimately, the blurred line between technology-rich environments and blended learning highlights the need for greater clarity and consistency in how technology is integrated into educational settings. For instance, there is a risk that some students may miss out on the benefits of a truly integrated digital learning experiences due to a lack of clear guidelines and frameworks for implementing blended learning practices. Educators can work towards closing the digital divide and promoting digital equity for all learners by addressing these disparities and ensuring that all students have access to high-quality blended learning opportunities.

In summary, at the macro-level, this case study's findings contribute to broader conversations about digital equity by illuminating the dynamic interplay between students' blended learning experiences, digital capital, & the digital divide. Significantly this contributes to literature by illustrating that access to ICTs have increased in schools which has ameliorated the digital divide but not necessarily addressed the digital use divide as literature cautioned (Department of Education, 2017, 2024; Resta et al., 2018; Gorski 2009). Challenges and frustration expressed by students towards inconsistency and managing multiple digital tools

highlighted a gap in digital literacy and proficiency to effectively engage with ICTs that build digital capital. This aligns with literature's notion that digital capital can be leveraged for self-improvement while also creating distinct forms of hierarchies & power (Ragnedda and Ruiu, 2020) and that the digital divide involves multiple levels (Gorski, 2005; Resta et al., 2018). The strong inclination towards engaging with physical/hands-on (tactile) materials over digital alternatives, that did not build their digital capital, revealed a potential gap known as the digital use divide as warned by literature (Department of Education, 2017, 2024) which could impact students' ability to fully benefit from digital environments. The discrepancies in the type of ICTs usage, aligns to literature's (Department of Education, 2017, 2024) distinction between active & passive content consumption. Notions that 'the grass is greener on the other side', based on students' awareness of discrepancies in the type of digital experiences, highlights the existence of a digital divide using a digital equity lens as suggested by literature (Gorski, 2005; Resta et al., 2018; Moldavan, Capraro, et al., 2021). Some students had access to more innovative and engaging digital learning experiences than others. This emphasizes the complexities of the digital divide as suggested by literature that argues that equal access does not translate to equitable access (Moldavan, Capraro, et al., 2021) and aligns with literature that calls for thoughtful intervention and attention to how technology is used for learning (Resta et al., 2018; Gorski 2009). Furthermore, students expressed a profound desire, which runs deeper than preference, to engage creatively with technology in ways that literature suggests build their digital capital (Ragnedda & Ruiu, 2020). Educators can work towards closing all levels of the digital divide by moving towards digital equity (Department of Education, 2024), to ensure that all students have access to high-quality blended learning opportunities, that build high yield digital capital.

Implications for Practice

In the rapidly evolving landscape of educational technology, listening to student voices provides invaluable feedback for technology integration to enhance blended learning experience. The case study's three key findings offer significant implications for educators to design and implement effective, engaging, and equitable blended learning experiences. As educators seek to optimize blended learning environments for student success, it is imperative to consider this case study's implications for practice (Table 2) across the following domains.

Table 2: Implications for Practice

Curriculum Design	Pedagogical Practices	Professional Development
We must prioritize simplicity & flexibility within curriculum designs that foster equitable blended learning experiences. We need to adopt a "less is more" approach to technology integration within curriculum designs that emphasize quality over quantity. We need to find a balance between digital & tactile elements within curriculum designs that offers flexibility in meeting the diverse needs of students with the integration of digital activities that supplement hands-on (tactile) activities but do not replace. We need to address digital equity issues within curriculum designs by purposefully integrating digital resources, that build high yield digital capital, rather than merely making them available in the classroom.	*We must address key pedagogical details emphasized in the findings by employing "less is more' approaches.* We need to consider student views of digital interfaces to streamline accessibility and usability that promotes smoother engagement with course materials and reduces cognitive overload. We need to mitigate feelings of being overwhelmed by a barrage of digital demands with a 'less is more' approach that consistently utilizes digital tasks, that build high yield digital capital. We need to purposefully select digital assignments that allow for flexibility and supplements rather than replace traditional tactile activities, for the sake of digitizing them. We need to address that blended learning pedagogy is an issue of digital equity by engaging in active technology usage that builds high yield digital capital, rather than engaging in passive content consumption.	*We must provide ongoing training and support for educators to understand and address that blended learning is a digital equity issue, dynamically interconnected with digital capital & the digital divide.* We need targeted educator training focused on 'sweating the small stuff', to address key pedagogical details emphasized in the findings. We need to targeted educator trainings focused on 'Flexibility to supplement but not replace,' to strategically supplement traditional tactile experiences with technology rather than replace them. We need to provide institutional initiatives that empower educators to leverage digital tools, that build high yield digital capital, within curriculum designs & pedagogical practices.

Curriculum Design

Effective curriculum design is instrumental in shaping a positive and equitable blended learning experience for students. Drawing from insights gathered from this case study, several implications for practice in curriculum design have emerged. We can enhance our curriculum designs when developing blended learning designs to meet the unique needs of our students more effectively, by reflecting on the significance of these findings. These findings call for prioritizing simplicity & flexibility within curriculum designs that foster equitable blended learning experiences.

A key implication from the case study is that we need to adopt a "less is more" approach to technology integration within curriculum designs that emphasize quality over quantity. Simplifying digital assignments, establishing predictable routines, and providing accessible content are vital steps to mitigate cognitive overload and enhance student engagement. Attention to the organization of digital infrastructures further supports seamless access to content, alleviating frustrations related to disorganized files. Prioritizing simplicity and consistency lead to more engaging and effective learning experiences, ensuring that digital tools are easy to navigate. Streamlining the technological aspects of blended learning is imperative. One way we can do this is by carefully selecting a single learning management system (LMS) as the centralized hub for students' computer-mediated elements. Consolidating digital resources and activities into one platform simplifies navigation for both educators and students. This intentional choice ensures that instructional materials are readily accessible and reduces the cognitive load associated with managing multiple platforms. Additionally, a singular LMS promotes consistency in content delivery, fostering a structured learning environment. Embracing this streamlined approach optimizes instructional efficiency while maximizing

student engagement in blended learning experiences. Furthermore, ensuring that students can track assignments and grades in a centralized location is fundamental to curriculum design. This involves structuring the curriculum and digital platforms in a way that facilitates easy access to assignment details and grades for students, ultimately enhancing their learning experience.

Another crucial implication in curriculum design is that we need to find a balanced integration of digital & traditional modalities that offers flexibility in meeting the diverse needs of students with the integration of digital activities that supplement hands-on (tactile) activities but do not replace. This integration ensures that students engage meaningfully with diverse learning experiences. By incorporating a variety of learning modalities, including both digital and tactile activities, educators can promote active participation and flexibility to meet the diverse needs of learners. Encouraging purposeful selection of digital assignments alongside paper-based tasks fosters a holistic learning experience and equitable opportunities for all students. In this context, embracing a "less is more" approach entails a balanced integration of traditional and digital modalities that carefully selects and integrates digital activities to complement hands-on (tactile) experiences without overshadowing them. Rather than replacing tactile activities entirely, educators carefully select digital resources that blend with hands-on learning, enriching the overall educational experience. For example, incorporating virtual labs as pre-labs or post-labs alongside in-person experiments maintains the invaluable tactile experience while leveraging digital tools to deepen understanding. Similarly, using digital activities to provide immediate feedback after hands-on activities, allowing students to submit their answers or test their knowledge gained from the tactile activity. This seamless transition from hands-on to digital interaction enhances comprehension and reinforces learning outcomes, all while embodying the essence of the "less is more" approach by emphasizing quality over quantity in

curriculum design. Moreover, this may also address issues associated with disparities in instructional quality and access to meaningful digital experiences.

Furthermore, another crucial implication in curriculum design is that we need to address digital equity issues by purposefully integrating digital resources, that build high yield digital capital, rather than merely making them available in the classroom. This ensures that students acquire and apply essential skills for navigating digital platforms and building digital competencies. Planning and structuring educational content and activities are vital aspects of this integration, ensuring students develop proficiency in digital literacy. Providing ample support and resources is crucial to empower students with equitable opportunities to gain digital capital. This could be accomplished by seamlessly integrating digital literacy across various subject areas. In these integrated units, students could engage in activities aimed at navigating digital platforms and using digital tools creatively. They could explore innovative methods of presenting knowledge across digital mediums such as blogs, videos, animations, and simulations. By aligning these activities with specific learning objectives and standards, students develop digital literacy skills and foster creativity within their academic studies. Ultimately, integrating digital literacy across our curriculum offers students diverse opportunities to build digital capital while reinforcing learning outcomes.

Overall, this case study highlights the importance of adopting a "less is more" approach to a balanced integration of traditional and digital modalities, which supplement but not replace, in ways that build high yield digital capital within curriculum designs. Simplifying assignments, establishing routines, and ensuring accessible content by emphasizing quality over quantity, may mitigate cognitive overload and enhance student engagement. Flexibility is offered to meet the diverse needs of students, by using a balanced integration of digital & traditional modalities

within curriculum designs, in ways that supplement rather than replace. Digital equity issues within curriculum designs can be addressed by purposefully integrating digital resources, that build high yield digital capital, rather than merely making them available in the classroom. We can embrace these implications for practice in curriculum design by prioritizing simplicity and flexibility to enhance the learning experience, foster meaningful engagement, and digital equity for all students.

Pedagogical Practices

Effective pedagogical practices play a vital role in creating engaging, meaningful, and inclusive learning experiences in blended learning environments. We must address key pedagogical details emphasized in the findings by employing "less is more' approaches while addressing that blended learning pedagogy is an issue of digital equity. This section discusses key implications for pedagogical practices, derived from this case study, which highlight the importance of organizing digital content and supplementing traditional methods with technology, that enhance digital literacy and build high yield digital capital.

A key implication for pedagogical practice, drawn from Finding 1, is that we need to consider student views of digital interfaces to streamline accessibility and usability that promotes smoother engagement with course materials and reduces cognitive overload. Educators can enhance accessibility and usability, reducing cognitive overload and promoting smoother engagement with course materials by tailoring these platforms to reflect student views. This might be accomplished by integrating assignment deadlines into centralized calendars or organizing digital content in a more accessible way to align with student preferences. This strategic move not only streamlines organization but also empowers students to manage their workload efficiently. Additionally, implementing a unified calendar system across courses

simplifies planning and reduces cognitive load for students. Ultimately, we need to mitigate feelings of being overwhelmed by a barrage of digital demands with a 'less is more' approach that consistently utilizes digital tasks, that build high yield digital capital.

Another significant implication for pedagogical practice, drawn from finding 2 and 3, is that we need to purposefully select digital assignments that allows for flexibility and supplements but does not replace traditional tactile activities, for the sake of digitizing them. For instance, we can integrate instructional videos as supplementary resources for in-class lectures or activities to enrich students' learning experiences. These videos may offer additional avenues for comprehending complex concepts and provide reinforcement outside of traditional classroom settings. Furthermore, we can leverage interactive features within these videos to actively engage students in the learning process while preserving the integral role of the teacher. This approach may foster a deeper comprehension and retention of content without displacing traditional instructional methods. We can incorporate instructional videos as supplements to lectures by emphasizing the active use of technology to enhance student engagement, thereby enriching the learning journey, and providing additional resources. Moreover, the integration of interactive questions within these videos may personalize the learning experience and serve as individualized tutors rather than replacements for teachers. This highlights the significance of leveraging technology to support classroom instruction to foster more effective learning outcomes by moving beyond passive consumption of information to embrace active learning strategies that utilize technology as a tool for empowerment. Furthermore, this case study illustrates great emphasis, specifically across findings 2 and 3, on students' preferences for hands-on tactile activities to engage in experiential learning opportunities. This preference emphasizes the importance of providing students with tangible experiences, enabling them to

interact physically with materials. However, educators can enhance traditional tactile activities within blended learning environments by integrating digital tools rather than replacing them entirely. For example, leveraging technology such as simulations, virtual labs, or interactive learning platforms can create dynamic and engaging experiences that provide flexible opportunities to meet the diverse needs and preferences of students. This can be accomplished by implementing various teaching strategies to effectively engage students with a combination of physical interaction and digital resources. Educators can offer students additional opportunities for exploration and experimentation in a virtual setting by incorporating digital activities like virtual labs and simulations alongside hands-on activities. This approach ensures that students receive opportunities that prepare them for the digital landscape while still valuing the importance of tactile experiences. Furthermore, educators can effectively prepare students for success in the digital age and beyond by leveraging technology to enhance traditional instructional methods such as hands-on experiential learning opportunities.

A key implication for pedagogical practice, drawn from all three findings, is the necessity to address that blended learning pedagogy is an issue of digital equity by engaging in active technology usage that builds high yield digital capital, rather than engaging in passive content consumption. We can strategically integrate activities designed to enhance digital literacy, in ways that build high yield digital capital. This can be accomplished by introducing opportunities that promote effective navigation of digital platforms, research skills for online content, and responsible utilization of digital tools. This would involve certain pedagogical considerations such as selecting appropriate instructional strategies, resources, and assessments to support the development of digital competencies among students. For instance, the strategic incorporation of technology for assignment submission presents a pivotal avenue for enhancing digital literacy

among students. While some students may prefer the simplicity of submitting pictures of their assignments, this method might prove to be more troublesome for some students and does not inherently contribute to ongoing digital literacy development once this digital task is mastered nor high yield digital capital. Instead, educators can leverage technology by having students input their answers into a centralized online platform, enabling self-grading and facilitating the cultivation of digital literacy that builds digital capital that may be useful for navigating state online testing. Given the increasing prevalence of online standardized tests, familiarity with digital interfaces and various question formats like hotspots, drag-and-drop, constructed responses, and text entry is paramount. These question types not only evaluate content knowledge but also require students to navigate digital platforms effectively, emphasizing the importance of digital literacy in today's educational landscape. Thus, by purposefully integrating technology for assignment submission we may enhance learning outcomes and empower students with digital literacy skills that build digital capital vital for success in today's digital landscape. Additionally, we can also shift our pedagogical practices towards utilizing technology for active engagement rather than passive consumption of information, further building and leveraging students' digital capital. For instance, leveraging interactive questions embedded within supplemental instructional videos not only reinforces understanding but also builds essential digital literacy skills that build digital capital crucial in today's digital age. Additionally, we can provide students with opportunities to engage in digital creativity to showcase mastery of the content. For instance, students could actively engage in the learning process by displaying their content knowledge through various digital mediums such as blogs, videos, animations, 3D renditions, or simulations. We can foster a dynamic learning environment that promotes active participation and deeper comprehension of the subject matter by embracing this approach.

Moreover, it encourages students to think innovatively and express their understanding in diverse and creative ways beyond traditional formats like poster boards or PowerPoint presentations. This intentional integration of technology not only enhances students' learning experiences but also empowers them to develop essential digital skills that build digital capital which serves as beneficial resources in the modern world. Furthermore, this also leverages technology to actively engage students in the learning process as opposed to passively consuming information by encouraging students use digital tools creatively to demonstrate their understanding of the content.

Overall, this case study provides significant implications for pedagogical practice that call for educators to leverage technology by using a simplified approach to meet student needs, supplement traditional methods with technology rather than replacing it, and build high digital capital. Educators can create dynamic learning environments that provide flexible opportunities to meet the diverse needs of students, enhance engagement, and promote deeper comprehension of the content, by actively integrating these implications. Furthermore, educators can prepare students for success in an increasingly digital world while fostering their development as lifelong learners by embracing technology as a tool for empowerment.

Professional Development

Effective professional development is essential to prepare educators with the knowledge, skills, and resources needed to navigate the complexities of blended learning environments effectively. This section provides key implications for professional development, drawn from this case study, that focus on embracing a ‘less is more’ approach to technology integration, a balanced integration of traditional and digital modalities that supplement but not replace, and building digital capital. To do so, we must provide ongoing training and support for educators to

understand and address that blended learning is a digital equity issue, that is dynamically interconnected with digital capital and the digital divide.

A key implication for professional development is the necessity of targeted educator trainings focused on ‘sweating the small stuff’, to address key pedagogical details emphasized in the findings, such as simplifying digital assignments, establishing predictable routines, and providing accessible content. This targeted training could help educators organize their digital infrastructures to ensure seamless access to digital content is achieved which may alleviate frustrations associated with disorganized files. The primary focus can be placed on prioritizing simplicity and consistency in the use of digital tools, thereby making it easier to navigate while fostering more engaging and effective learning experiences for students. Administrators and policy makers can promote a supportive environment favorable to innovative and impactful teaching practices by providing educators with the necessary skills and resources to implement these strategies. These trainings can build educators awareness how to carefully select and effectively use a learning management system (LMS) as a centralized hub for students' computer-mediated elements. Educators could benefit from learning how to consolidate digital resources and activities into one platform to simplify navigation for both them and students. This approach ensures that instructional materials are readily accessible and reduces cognitive load associated with managing multiple platforms, fostering a structured learning environment. Administrators and policy makers can support educators in facilitating efficient and effective instructional delivery, while enhancing student engagement and learning outcomes, by providing educators with the necessary skills and knowledge in LMS utilization.

A key implication for professional development is the need for targeted educator training that is focused on ‘Flexibility: Supplements but not Replace,’ to strategically supplement

traditional tactile experiences with technology rather than replacing them. For instance, targeted training could focus on empowering educators to leverage technology by using effective pedagogical practices and instructional strategies, while promoting inclusive teaching practices. Furthermore, these trainings can focus on the purposeful selection and integration of digital activities alongside tactile experiences, rather than replacing them entirely. Educators will benefit from learning how to seamlessly blend digital resources, such as virtual labs and simulations, with hands-on activities to enhance comprehension and reinforce learning outcomes. Administrators and policy makers can help establish initiatives to create more equitable learning environments by addressing disparities in instructional quality and access to meaningful digital experiences.

A key implication for professional development is the need to provide institutional initiatives that empower educators to leverage digital tools, that build high yield digital capital, within curriculum designs & pedagogical practices. Educators should receive training on planning and structuring educational content and activities to develop students' proficiency in digital tools more effectively, in ways that build high yield digital capital. This entails providing ample support and resources to design integrated units focused on digital literacy and incorporate various digital mediums for students to demonstrate their understanding. Educators can implement these strategies to ensure that students acquire and apply essential skills for effectively and actively using digital tools that build high yield digital capital. Administrators and policy makers should prioritize the development and implementation of such initiatives to equip educators with the tools and knowledge needed to effectively integrate digital literacy, that build high yield digital capital, into their teaching practices. It is vital that administrators and district policy makers prioritize ongoing support and coaching to educators for addressing digital

equity issues in blended learning, while also addressing challenges that may arise. This can be achieved through the establishment of instructional coaching programs and collaborative professional learning communities, where educators can share and learn from each other's experiences and practices related to blended learning. These initiatives serve as a means of sustaining ongoing growth and development among educators by fostering a culture of collaboration and continuous learning. Moreover, these implication for professional development create a collaborative community across the school and district, where educators can collaborate with other stakeholders such as administrators, instructional designers, and technology specialists to collectively develop and refine effective blended learning practices that meet the needs of all students by addressing issues of digital equity. Administrators and policy makers should prioritize the implementation of such initiatives to ensure the successful integration of blended learning practices into educational settings.

Overall, targeted training and ongoing support are vital for educators to effectively implement blended learning environments that integrate technology for active use which builds high yield digital capital. Administrators and policy makers should prioritize professional development initiatives focused on simplifying digital assignments and leveraging learning management systems while also integrating traditional and digital modalities in ways that supplement and build high yield digital capital. Collaborative coaching programs and learning communities are essential for sustaining ongoing growth and addressing issues of digital equity across blended learning environments. Campus and district administrators can establish collaborative communities that empower educators to address blended learning as a digital equity issue by equipping them with the necessary skills and resources to engage in impactful teaching practices that enhance students' learning experiences.

Summary of Implications for Practice

Educators and policymakers can use this case study's insights as a guide for enhancing blended learning practices centered on addressing the unique needs of students to better prepare them for success in an ever-evolving educational landscape. The implications for practice that this case study provides across curriculum design, pedagogical practices, and professional development focus on prioritizing simplicity, flexibility, and meaningful integration of technology. Educators and policymakers can use these implications to flexibly meet the diverse needs of students by addressing blended learning as an issue of digital equity. Administrators and policymakers should prioritize professional development initiatives that empower educators to leverage technology seamlessly into teaching practices in ways that build high yield digital. Furthermore, stakeholders should collaborate to move towards digital equity by establishing blended learning environments that prepare students for success in the digital age.

Suggestions for Future Research

This exploratory case study of student blended learning experiences in post emergency learning offers valuable insights into the students' challenges and preferences with a blended learning environment. Future research can extend these findings to deepen our understanding of blended learning and contribute to the ongoing discourse on effective educational practices. One avenue is investigating the impact of a 'less is more' approach to technology integration on student learning. This could provide broader insights into sustained effects and effective engagement strategies. Similarly, a longitudinal case study tracking the long-term effects of blended learning on student outcomes and digital literacy could assess the durability of practices advocated in this case study. Further research could explore the effectiveness of different blended learning models and instructional strategies, emphasizing the importance of balancing

digital and traditional modalities. Additionally, future research can optimize blended learning experiences by investigating pedagogical strategies that seamlessly integrate digital and tactile activities, aligning with the findings of this case study. Another avenue of future research can explore students' perceptions of "hands-on" learning and its relation to digital equity is essential for ensuring equitable access to activities. Similarly, exploring differentiated instruction within blended learning contexts could refine instructional practices to better serve all students. Furthermore, a case study could explore how differentiated instruction is defined and experienced by both students and teachers within a blended learning environment to gain deeper insights into the effectiveness of personalized learning approaches. Another avenue of future research can expand this case study's findings by investigating instructional strategies in technology-rich classrooms, broadening our understanding beyond blended learning by exploring how educators use digital tools to enhance student engagement, promote active learning, and personalize instruction. By examining technology integration across various contexts, future research can offer insights into effective practices and inform professional development initiatives for educators. This may contribute to the ongoing discourse on effective educational practices by providing actionable insights for creating technology-rich learning environments conducive to student success. Overall, future research may expand our understanding of blended learning, as noted by this case study, while contributing to the development of effective educational environments for all students. Addressing these areas of future research can contribute to the ongoing improvement of blended learning practices, by making them more effective, engaging, and inclusive for diverse student populations.

Conclusion

In conclusion, this case study shines light on students' needs, challenges, and opportunities within the evolving landscape of blended learning. The case study's exploration of student experiences in post-emergency learning environments highlights the necessity of embracing innovation and flexibility in educational practices. Educators and institutions must ensure equitable access to both face-to-face and computer-mediated instruction as literature (Novak & Tucker, 2021) suggests by addressing disparities found across the digital use divide (Department of Education, 2024). The case study's findings collectively emphasize the need to embrace a simplified approach to technology integration, refine instructional practices to effectively use technology as a supplement rather than a replacement for traditional tactile elements, while also advancing digital literacy that builds high yield digital capital. Furthermore, this case study significantly contributes to the discourse surrounding effective educational practices within blended learning as well as broader discussions on digital equity. It also offers actionable implications for educators, policymakers, and researchers across curriculum design, pedagogical practices, and professional develop that empowers educators to implement effective blended learning environments by address issues of digital equity. Moreover, future research can improve equitable access and personalized learning experiences by investigating instructional strategies and models, as well as analyzing differentiated instruction and technology integration. Overall, this case study contributes to literature and offers actionable insights for educators, policymakers, and researchers to enhance educational practices in blended learning more effectively. We can create more inclusive, engaging, and effective learning environments for all students by addressing the implications outlined in this case study and exploring emerging trends in blended learning,

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APPENDICES

APPENDIX A

APPENDIX A

Recruitment Script

This script will be read aloud to potential participants' parents/legal guardians via phone call. If both parent/legal guarding & student are interested the student will receive a Parent Legal Guardian permission form and Informed Consent to Participate in Research Case study.

My name is Mrs. Moreno, I am an Honors and AP biology teacher at this campus and also a graduate student in the Curriculum & Instruction doctoral program at the University of Texas Rio Grande Valley (UTRGV). I would like to invite your child to participate in my research case study to explore the blended learning experiences of students. This research case study has been reviewed and approved by the UTRGV Institutional Review Board for the Protection of Human Subjects (IRB). To participate, the student must be a high school senior and enrolled at this campus in the 2022-2023 school year. Participation in this research is completely voluntary, students may choose not to participate without penalty. As a participant, the student will be asked to answer questions regarding their blended learning experiences. All data will be confidential, in which their name will not be disclosed in any of the research findings and their responses will be kept confidential. If your child (student) would like to participate in this research case study, please ask them to stop by S102 to pick up the *Parent/Legal Guardian Permission Form*. Once you have read and agreed please sign and return both forms. Do you have any questions now? If you have questions later, please contact me by email at heidy.garciamoreno@utrgv.edu

APPENDIX B

APPENDIX B

Parent/Legal Guardian Permission Form

PARENT/GUARDIAN PERMISSION FORM FOR CHILD PARTICIPATION IN RESEARCH

Case study Title: An Exploratory Case Study of Students' Blended Learning Experiences During Post-Emergency Learning

Permission Form Name: _____

Principal Investigator: Heidy Garcia-Moreno Telephone: (____) _____

Emergency Contact: _____ Telephone: (____) _____

Key points you should know

- I am inviting your child to be in a research case study I am conducting. Your child's participation is voluntary. This means it is up to you and your child to decide if they can be in the case study. Even if you decide to have your child join the case study, you are free to have them leave at any time if you change your mind.
- Take your time and ask to have any words or information that you do not understand explained to you.
- I am doing this case study because I want to explore how students experienced blended learning during the 2021-2022 school year

- Why is your child being asked to be in this case study?
    - To help the educational community identify support systems needed for effective classroom instruction using blended learning.
- What will your child do if you agree for them to be in the case study?
    - Participation in this case study will be confidential and audio recorded during initial and follow-up interviews, by signing this consent form you are giving us permission to make and use these recordings for the purposes of the case study.
- Can your child be harmed by being in this case study?
    - Being in this case study involves no greater risk than what your child ordinarily encounters in daily life.
    - Risks to your child's personal privacy and confidentiality: Your child's participation in this research will be held strictly confidential and only a code number will be used to identify their stored data. However, because there will be a link between the code and their identity, confidentiality cannot be guaranteed.
    - If we learn something new and important while doing this case study that would likely affect whether you would want your child to be in the case study, we will contact you to let you know what we have learned.
- What are the costs of being in the case study?
    - There is no cost for being in the case study and is a voluntary basis.
- Will you or your child get anything for being in this case study?
    - You will not receive any payments for taking part in this case study.

- What other choices do you have if you decide not to have your child be in the case study?
    - Participation in this research case study is on a voluntary basis, withdrawal from the case study can be done at any time if you or your child wish to do so with no penalty in anyway.
- Could your child be taken out of the case study?
    - Your child could be removed from the case study if you or your child do not feel comfortable in proceeding.
- Can the information we collect be used for other studies?
    - Information that could identify your child will be removed. Information your child gave us regarding their blended learning experiences may be used for future research by us or other researchers; we will not contact you to sign another consent form if we decide to do this.
- What happens if I say no or change my mind?
    - You can say you do not want your child to be in the case study now or if you change your mind later, you can stop their participation at any time. No one will treat your child differently. Your child will not be penalized.
- How will my child's privacy be protected?
    - Your child's information will be stored with a code instead of identifiers (such as name, date of birth, email address, etc.).
    - No published scientific reports will identify your child directly.

- If it is possible that your child's participation in this case study might reveal behavior that must be reported according to state law (e.g. abuse, intent to harm self or others); disclosure of such information will be reported to the extent required by law.

- Who to contact for research related questions?
  - For questions about this case study or to report any problems your child experiences as a result of being in this case study contact me, Heidy Garcia-Moreno via email: Heidy.garciamoreno@utrgv.edu.
- Who to contact regarding your child's rights as a participant?
  - This research has been reviewed and approved by the University of Texas Rio Grande Valley Institutional Review Board for Human Subjects Protections (IRB). If you have any questions about your child's rights as a participant, or if you feel that your child's rights as a participant were not adequately met by the researcher, please contact the IRB at (956) 665-3598 or irb@utrgv.edu.

Signatures

By signing below, you indicate that you are voluntarily agreeing to have your child participate in this case study and that the procedures involved have been described to your satisfaction. The researcher will provide you with a copy of this form for your own reference.

_____ ____/_____/_____

Parent/Guardian's Signature Date

Child's Full Name: _____

APPENDIX C

APPENDIX C

Informed Consent to Participate in Research Case Study

An Exploratory Case Study of Students' Blended Learning Experiences

During Post-Emergency Learning

This research case study is being conducted by Heidy Garcia-Moreno from the University of Texas Rio Grande Valley. The purpose of this case study is to explore students' experiences navigating blended learning during post emergency learning. Participation should take about 30-60 minutes to complete. Participation in this research is completely voluntary. If there are any questions or parts of this case study which you are uncomfortable completing, feel free to withdraw your participation at any time without question or comment. Choosing not to participate will not adversely affect your grade or standing in the class. To participate, you must be a high school senior currently enrolled at this campus. If you are not, please do not participate.

I, _____, understand and agree to participate in this research case study with the purpose of exploring how students experience blended learning in high school. I am aware that I will be asked various interview questions regarding the focused phenomenon. I am also aware that the investigator will take notes of my answers and the meeting will be recorded.

I understand that my name will not be disclosed in any of the research findings and that my responses will be kept confidential.

Risks: The interview will be held on a weekend but is entirely voluntary, with no foreseeable risks. I understand that I have the right to decline to answer at any time and end the interview if I wish to do so.

Benefits: Participation in the case study is voluntary with no compensation. Possible benefit would be in their contribution to scholarly research. Overall, no direct benefits will be given to participants.

I, _____ understand that my participation in this research case study is on a voluntary basis. I can withdraw at any time if I wish to do so with no penalty in anyway. I also understand that I will not be compensated for my participation if I choose to continue. I have been given an opportunity to ask any questions or share concerns about the case study. I will receive a copy of the dated and signed consent form for me & my parents/legal guardians to read and keep.

Participant Signature _____ Date: _____

Parent or Legal Guardian Signature _____ Date: _____

Principal Investigator _____ Date: _____

This research has been reviewed and approved by the University of Texas Rio Grande Valley Institutional Review Board for Human Subjects Protection (IRB). If you have any questions about your rights as a participant, or if you feel that your rights as a participant were not adequately met by the researcher, please contact the IRB at (956) 665-3598 or irb@utrgv.edu.

APPENDIX D

APPENDIX D

Initial Interview Guided Protocol

Purpose Statement: The purpose of this exploratory case study is to explore how high school students experience blended learning in post emergency learning.

Time of interview: _____ **Date: _____**

Place: Campus Library

Interviewer: H. Moreno **Interviewee Code: _____**

Introduction: Hello, I am Mrs. Moreno and would like to thank you for joining the meeting today and agreeing to participate in this research interview for my case study as part of my pursuit of a Doctorate in Education. I am interested in what it is like for students to use devices in the classrooms. I want to teach other teachers and help them understand what students may like or dislike from using their devices, to help us better improve their uses in the classroom. This is important because there aren't many studies that provide students' perspectives, usually it is about teachers. Our interview today will most likely last between 30 to 60 minutes in which I will ask about your experiences last school year. This is really a conversation so if you want to add anything please feel free to do so during this time, and if there is anything you don't understand or you want me to repeat let me know.

Statement of Consent

You completed a consent form with your parent(s) or legal guardian(s) indicating that I have your permission to record our conversation. If you feel the need to ask any questions throughout the case study, please feel free to ask and I would be happy to answer them. You may also ask me to stop the recorder at any moment. *[start recording]*

Building Rapport

Thank you for being here, especially after school. Your experiences will help us understand how we can improve the use of devices in the classroom. Please know that your input is incredibly vital to this educational research, so once again thank you.

1. Tell me about school.
    a. How is it going so far?
        i. What extra-curricular activities do you participate in?
        ii. Did you have a busy summer as well?
    b. How long have you attended this campus?
        i. What are you looking forward to this year?

Content Oriented

I teach biology and use lots of technology in my classroom. I'm always looking for ways to improve the use of devices in the classroom, which is why I'm case studying how high school students use devices, specifically their Chromebooks, in the classroom.

1. Tell me about your experience during virtual learning when school was closed?
    a. Tell me more about....

b. What devices did you use during that time?

c. What was your set up at home?

d. Did you stay connected with your classmates?

2. Tell me about your experience coming back in person last year, what was school like?

    a. What devices did you use?

        i. Wow when you talk about it, it can be kind of confusing because during the virtual learning, the devices were used to go to school and now using devices is like a combination of both during class and outside of the class...

        ii. Tell me how that works, is it every day for the whole class period?

        iii. How do you know what to use or do for each activity/task?

    b. What did you like, why?

        i. Tell me in what way did you feel that you had control over when you accessed course material.

        ii. Tell me in what way did you feel that you had control over where you accessed course material.

        iii. Tell me in what way did you feel that you had control over how much time was spent on reviewing course material.

        iv. Tell me in what way did you feel that you had control over how you learned course material.

    c. What subjects did you like the best, what worked best?

        i. Did you use devices in that class?

        ii. Was it only in the classroom?

3. Tell me about the most frustrating time with technology. Did you know of any friends that were frustrated?
    a. Do you think that was fair?
    b. There were a lot of students that didn't have a connection during virtual learning, do you think it was fair?
4. Tell me about what your favorite class activity or task to complete on a device?
    a. What works for you when you use devices?

Closing Statement

Thank you once again for meeting with me today and agreeing to participate in my case study. I will contact you for our next interview in which we will discuss any follow-up questions that are necessary to clarify any information once I begin to categorize the data. Once again please feel free to contact me if you have any questions regarding the case study. Thank you and have a great day. *[Stop recording]*

APPENDIX E

APPENDIX E

Follow-up Interview Guided Protocol

Purpose Statement: The purpose of this exploratory case study is to explore how high school students experience blended learning in post emergency learning.

Time of interview: _____ **Date: _____**

Place: Campus Library

Interviewer: H. Moreno **Interviewee Code: _____**

Introduction: Hi, thank you for meeting with me again in this follow-up interview. Our interview today will most likely last between 15-30 minutes in which we will discuss topics from our previous conversation that I just wanted some more clarification on. Just like last time this is really a conversation so if you want to add anything please feel free to do so during this time, and if there is anything you don't understand or you want me to repeat let me know.

Statement of Consent

You completed a consent form with your parent(s) or legal guardian(s) indicating that I have your permission to record our conversation. If you feel the need to ask any questions throughout the case study, please feel free to ask and I would be happy to answer them. You may also ask me to stop the recorder at any moment. *[start recording]*

Building Rapport

I just want to remind you that this is completely voluntary, so thank you for meeting with me after school to discuss a couple of things in more detail to gain clarification. Please know that your input is incredibly vital to this educational research, so once again thank you.

1. Tell me about school. How is it going so far?
2. Are you getting ready for the end of your senior year?

Content Oriented

Let's recap a bit from the last time we talked, you mentioned …

1. The classes that did use technology in the classroom, tell me about your thoughts regarding the balance between the tactile activities and digital ones?
2. Did you feel there were certain activities or tasks that were better performed digitally?

Closing Statement

Thank you once again for meeting with me today and agreeing to participate in my case study. Once again please feel free to contact me if you have any questions regarding the case study. Thank you and have a great day. *[Stop recording]*

VITA

Heidy Garcia-Moreno is an experienced K-12 educator with extensive blended learning experience and strong commitment for student success. With over ten years of experience in teaching and learning, she has sharpened her skills as an educator and made significant contributions to student learning. She has worked within economically disadvantaged campuses that are predominately composed of Hispanic student populations classified as ‘at-risk’. Heidy Garcia-Moreno received a Bachelor of Science degree and teaching certification in secondary science education from the University of Texas at Brownsville (UTB) in 2008. Driven by her commitment to advancing education, she then earned a Master of Education in Curriculum and Instruction degree from UTB in 2012. Heidy Garcia-Moreno then pursued further studies and graduated from the University of Texas Rio Grande Valley in May 2024 with a Doctor of Education in Curriculum and Instruction degree. Heidy Garcia-Moreno, Ed. D. can be reached via email at dr.heidymoreno@gmail.com.