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**DIGITALLY RURAL:
IDENTIFYING HOW TECHNOLOGICAL INEQUITY
IMPACTS RURAL STUDENTS
IN FIRST-YEAR WRITING COURSES**

by

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DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Doctor of Philosophy
English**

The University of New Mexico
Albuquerque, New Mexico

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DEDICATION

This dissertation is dedicated to the memory of

Leota Joann

And everyone she represents:
The small town, dirt road folks.
The ones who sacrifice and toil.
The ones who hope and pray.
And the ones who dream
Of a brighter future
For their children.

We did it, GG.

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To the rural students: When I started college, I was where you are. I know firsthand how hard learning to exist in academia can be when you live off the grid half the week. I can promise you though, it's worth the effort. With that said, thank you. Thank you for sharing your stories, your triumphs, your struggles, your thoughts, and your opinions. Because of your candor, hopefully we can make things a little easier for the next generation of rural students to walk through the doors.

To my dear family, and to my friends who have become family: I thank you all for your love and understanding while I've been hidden away working on this project. You have been there for me through this adventure, and I appreciate you sticking by my side. Love you heaps and tons.

To my parents: As a first-generation college student, getting this far in my education has been a struggle, but you and GG constantly encouraged me to push through, always willing to sacrifice so that I would have opportunities to learn that you never did. You believed in me when I didn't believe in myself, seeing me through insecurity and fear, and now through to the end. You have shaped me into the person I am, your hopes for my future serving as the steps that carried me to this accomplishment. Gratitude doesn't begin to cover it. I love you.

To my precious children, Ava, Iris, Henry, and Jack: I love you more than words can possibly begin to express—and I would know, I've memorized a LOT of words! Parents always want more for their children and this, this project, is the beginning of me being able to empower you to reach higher than I did. You watched me achieve my dreams and now I will be able to help you achieve yours.

Finally, to my husband, Robert: You, simply, are the inspiration in my life. You have been a constant support, offering unwavering confidence in my ability to do this since day one, cheering me on through to this finish line. I could not have done this without your nurturance, your comforting presences, and, most essentially, your love. I love you forever, Mr. Nevada.

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ABSTRACT

To teach composition in this era means to engage students with technology; it is all but an unspoken requirement at the majority of universities. This dissertation theorizes, however, that the imbricated use of technology in first-year writing (FYW) classrooms places rural students at an inherent disadvantage, with issues of inadequate technological proficiency and inconsistent access causing a substantial learning disparity between this student population and their urban peers. Through mixed-methods data analysis of student survey responses and final FYW course portfolios, this study reveals that the expectation of technological access and presumption of digital literacy is detrimental to rural student success in these courses. This dissertation culminates in a call to recognize how technological requirements in FYW courses, though beneficial in many instances, can become obstructive to rural student success, and concludes with a discussion of possible equity-minded solutions that may aid in supporting technological equity for rural students.

Keywords: Rural, equity, writing, technology, digital, literacy, pedagogy

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Chapter 1: Introduction

The use of evolving technology to aid in learning has become an inherent facet to composition study. In fact, during the COVID-19 pandemic, we have seen how quickly and efficiently both composition students and instructors have been able to transition courses from face-to-face to an online model, salvaging the 2020 school year for thousands of students. Composition theory practices have long lauded the use of technology in writing courses as these digital tools open innumerable possibilities for genre study, experience with different mediums, and alternative communicatory and instructional avenues. There are clear, documented benefits to the use of digital platforms in composition classroom environments.

Unfortunately, despite these benefits, there are significant drawbacks to composition's intense liaison with technology. My principal assertion in this study is that the imbricated use of technology in first-year writing (FYW) classrooms places a specific sector of students, namely those who are geographically and/or digitally rural, at an inherent disadvantage due to issues of inadequate technological proficiency and inconsistent access, both of which contribute to a substantial learning disparity between this student population and their urban peers. It is important to note that this issue is one that existed prior to the COVID-19 pandemic but has become more apparent since pandemic-era requirements necessitated a massive technological shift. To teach composition in this era means to engage with the technological platforms available; they are all but an unspoken requirement. I argue, however, that the lack of technological proficiency many rural students experience is due to limited or inconsistent access in both their formative and

college learning years, making the constant barrage of technology present as a barrier to learning core composition content.

My second assertion is that heavy reliance on technological access and use within composition classrooms helps to reinforce power hierarchies in academia. Those who have the socioeconomic means to access technology regularly have the advantage in the classroom, something which leaves both financially disadvantaged and geographically rural students in a position of both inequity and inequality. The following discusses how this student population is defined for this study and details the structure of this dissertation study including the core thesis statement, guiding questions, significance and limitations of the study, and ends the chapter with a summary statement.

Defining the Rural Student

Rurality is a relative term that can be defined by many factors such as geography, socioeconomics, and even cultural systems of specific regional areas. For this study, rurality is defined in two ways: geographically rural and, to coin a new term, digitally rural. The U.S. Census Bureau (2022) has noted that in order to define a geographically rural population, one must understand how the Bureau defines and delineates urban areas. Urban areas consist of two types of geographies; "Urbanized Areas" have a population of 50,000 or more, while "Urban Clusters" have a population of at least 2,500 and less than 50,000. Because of how vast and varied rural populations may be, the Census Bureau has stated that they "define rural as any population, housing, or territory NOT in an urban area." This definition, while it does serve to differentiate rural populations from urban populations, is vague and essentially deduces the only parameter of rurality into being "not urban." This simplification fails to take into consideration concepts of topography, access to commodities such as roadways, electrical grids, water systems, and socioeconomic factors that influence the existence of these populations.

There are, of course, other ways of defining rural populations that are more specific and appropriate for this study. For the sake of clarity, students in this study who are *geographically rural* were defined as *having come from or are currently living in a community with fewer than 2,500 people in a widespread or small, localized area, without immediate access to an urban area with a population of more than 2,500 people*. The rationale behind this definition is that by taking the smallest population number from the Census Bureau's definition of an urban cluster and expanding the scope of that number to widespread or small localities where,

because of their location, it is unlikely that they have direct access to the same commodities as urban areas, it gives a more dynamic view of this population.

The other rural population defined in this study are *digitally rural* students. These students are defined as *having come from or are currently living in a community in a widespread or small localized area, without immediate access to an urban area, and without reliable access to broadband or satellite internet*. Counter to the geographically rural defining parameter of population, the defining parameter for this population is access. This means that in this study, while geographically rural students may also identify as digitally rural, digitally rural students, though they experience similar issues of access, may identify as living in an area that does not meet the population parameters for geographical rurality.

Though there is clearly overlap between geographically and digitally rural populations, by defining these two populations separately, it allows for more breadth and inclusivity in the study. My hope is that by including students from both populations and assessing their similarities and differences with technological access, we can seek a rounded solution to the technological inequity that both groups experience.

Thesis Statement and Guiding Questions

Thesis Statement

The imbricated use of technology in first-year writing (FYW) classrooms places rural students at an inherent disadvantage, with issues of inadequate technological proficiency and inconsistent access causing a substantial learning disparity between this student population and their urban peers.

Guiding Questions

- How much does early (pre-college) access to technology affect digital literacy within rural student populations?
- How does prior limited access to technology affect student confidence in FYW courses?
- Does digital literacy improve substantially alongside FYW literacies when learned in conjunction?
- Does this student population feel anxious about their performance in FYW courses due to their technological proficiency level?
- Does this student population struggle to understand and/or retain core information from FYW courses as a result of these access issues?

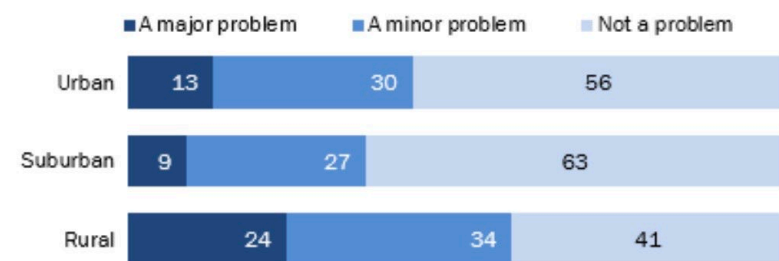
Significance of the Dissertation Study

A major obstacle that rural area students frequently encounter is learning not only the conventions of composing in Standard Edited American English (SEAE), but also basic computer literacy skills. When access is unstable or unavailable, rural students, despite being considered “digital natives” (per the defining features set forth by Prensky in 2001) may not have proficiency in digital literacies needed to function in first-year writing classrooms. This is something that, on the surface, may not appear to be an issue of major significance because of how intrinsic technology appears to be to every facet of our society, but according to the United States Census Bureau, digital access and equity is a critical matter.

In 2018, the Pew Research Center issued a report on a survey they conducted which found that, “24% of rural adults say access to high-speed internet is a major problem in their local community...An additional 34% of rural residents see this as a minor problem, meaning that roughly six-in-ten rural Americans (58%) believe access to high-speed internet is a problem in their area.”

Roughly one-in-four rural residents say access to high-speed internet is a major problem in their area

% of U.S. adults, by community type, who say access to high-speed internet is ____ in their local community



Note: Respondents who did not answer are not shown.
Source: Survey conducted Feb. 26-March 11, 2018.

PEW RESEARCH CENTER

Figure 1: Survey Results Regarding Rural Broadband Internet Access Problems, Pew Research Center, 2018.

Conversely, the report noted that only 13% of Americans who live in urban areas and 9% who live in suburban areas view access to high-speed internet service

as a major problem. The majority of both urban and suburban residents surveyed reported that access for them is not an issue in their local community. This indicates that difficulty accessing high-speed broadband internet is more than double for rural Americans than for those living in urban or suburban areas.

In addition to the nearly 60% of rural Americans who reported problems accessing high-speed internet at home, the Pew survey also found that 12% of those same respondents living in rural areas reported that they rarely use the internet, and a whopping 22% of rural area respondents report never using the internet due to issues with access, numbers that are nearly double those reported by urban or suburban residents. Couple these statistics with the fact that only 60% of rural respondents reported owning a device with which to access the internet (smartphone, tablet, or laptop), and the picture of digital inequality for rural residents becomes quite apparent.

To help address this issue, in 2021 Congress passed the Digital Equity Act as part of the Infrastructure Investment and Jobs Act. The State Digital Equity Planning Grant Program is the first of three Digital Equity Act programs that will be administered by the National Telecommunications and Information Administration (NTIA). Per the Census Bureau, under this legislation, “NTIA will allocate awards to participating States (including the 50 states, the District of Columbia, and Puerto Rico) based on their demographics, and availability and adoption of broadband.” As part of the funding allocation criteria, the Digital Equity Act identifies eight demographic populations to granted funding:

- “Individuals living in households with incomes at or below 150% of the poverty line.
 - Individuals 60 years of age or older.
 - Veterans.
 - Individuals living with one or more disabilities.
 - Individuals with barriers to the English language (including English language learners and those with low literacy).
 - Members of racial and ethnic minority groups.
 - Individuals residing in rural areas.
- Individuals incarcerated in a nonfederal correctional facility.”

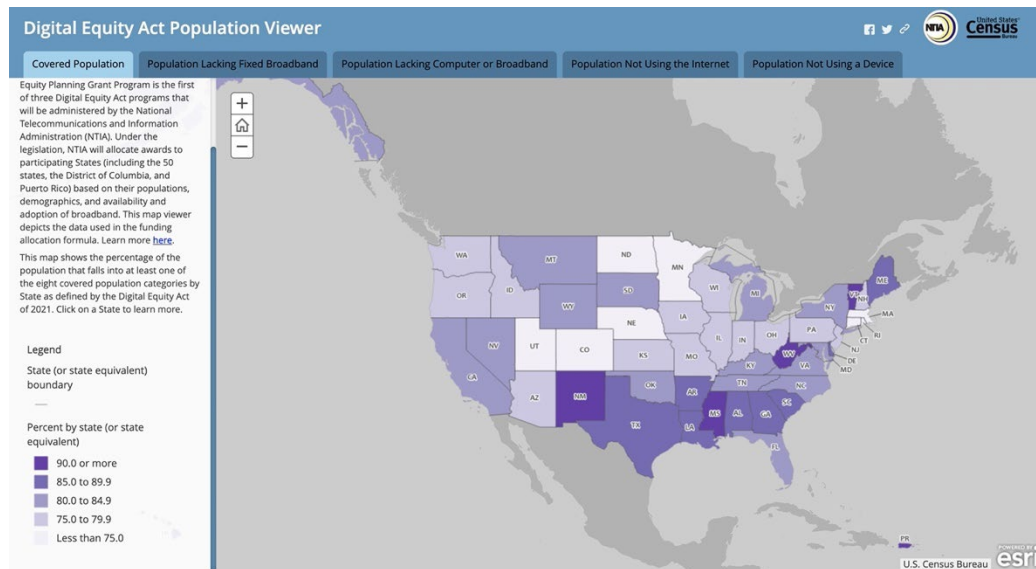


Figure 2: Map of the Percentage Covered by the Digital Equity Act by State, U.S. Census Bureau, 2021.

To bring this a little closer to the population surveyed for this dissertation, according to the Digital Equity Act Population Map (2021), 91.6% of New Mexicans fall under at least one of the eight above listed populations covered by the Digital Equity Act. More specifically, this map demonstrates that 39% of New Mexicans live in rural areas, 26% of the total population (rural and urban residents) do not have access to broadband internet, and 15% of the total population do not have access to a computer at all.

Of that 39% rural population, 92% are identified to not have adequate or reliable access to broadband internet services. Of that same 39% rural population, 77% report not owning or having access to a computer, tablet, or smartphone. This means that 36% of rural New Mexican cannot adequately access the internet and 30% of rural New Mexicans do not have access to a device with which they can access the internet. This indicates that while there may be some rural residents who do have technological access akin to urban residents, it does not negate the fact that a solid third of the population in New Mexico has limited access to internet and digital devices due to either cost, geographical inaccessibility, or a combination of those factors.

Technology is imbued so deeply into society that digital access and equity is a crucial necessity at this juncture. Rural New Mexicans' inequitable technological access is a significant disadvantage that, I argue, plays out inside collegiate composition classrooms. Bringing the focus even closer, writing courses are now spaces that have incorporated technological access as an inextricable component, meaning that the significance and implications of this study are far-reaching. The findings of this study demonstrate that there is a notable trend of rural students being negatively impacted in their writing courses due to lack of digital access, digital literacy, or both, something which should indicate to the field that new considerations for writing courses must be made, not just in New Mexico, but broadly in academia, so as to remediate the marginalization of this particular group of students.

Introduction Summary

The core goal of this study is to identify the learning disparity that the rural, first-year student population has with technology use in conjunction with the content presented in first-year writing courses. I argue that the heavy dependence on technology and the insistence on multimodality in first-year writing courses renders rural students in an inequitable position compared to peers who have had consistent access to technology. The imbalance of inadequate technological access and digital literacy negatively affects this student population's college writing experience by breeding feelings of inadequacy, overwhelm, and frustration, while also increasing the likelihood that they will not complete the course.

The secondary goal of this research is to address the othering of these students at both a pedagogical and institutional level and will seek to question academic hierarchies and power dynamics in a way that would encourage a more equitable learning space within digitally enhanced writing courses. When the expectations for technology use are quasi-standardized as blanket procedure by the institution, students who are outside the capabilities of that standardization suffer. However, at its root, digital composition pedagogy wants to make writing practicable to all students. There are hundreds of articles and studies that discuss best practices when implementing technology and how to empower student writers through the use of technology, but the gap in the practice remains equity for students who lack access to the technological tools and digital literacy needed to be successful.

This dissertation will first thoroughly review the related literature on this subject, examining how technology, composition pedagogy, sociological factors, and power structures in academia intersect, resulting in the marginalization of the

aforementioned rural student population and further highlighting the gap in the research that is digital inequity for rural students. It will then detail the methodology of this study, the data collection procedures, and the results and findings. Through the study of this student population and by seeking insight into these issues, the conclusionary commentary of this dissertation presents a challenge to the field and gives rise to this important question: how can instructors use best pedagogical practices to support the success of rural students who may have limited access to technology?

Chapter 2: Review of Related Literature

As noted in the previous chapter, in the new age first-year writing (FYW) classroom, digital media usage and multimodality is becoming not just commonplace, but rather the norm. There have been countless articles published on both the benefits and drawbacks to using technology in the FYW classroom, the pedagogies associated with teaching using digital platforms as an aid, as well as teaching students to implement digital tools as multimodal components in their own work. The following discusses books and articles which relate to teaching FYW in a university setting and strives to amass a representative body of research on the topics of technology use in composition, how this field has evolved to rely so heavily on multimodality, and the benefits and drawbacks of technology use for FYW students, particularly those who identify as rural students. Because this is a very specific topic, there is very little research that completely encompasses all these elements at once, but each of these pieces demonstrates valid and pertinent information which sets the precedence and rationale for this study.

Though much of the literature here is from composition and digital pedagogy studies, other content has been procured from other fields such as psychology, language, literacy, and sociocultural studies (LLSS), applied linguistics, and giving it a multidisciplinary and rounded view of the available research. This review is organized into five specific bodies of research: research regarding the history of technological integration into composition pedagogy; research regarding contemporary pedagogy surrounding technology use in FYW classrooms; research regarding sociocultural studies and cultural diversity in the FYW classroom; research

regarding equity-minded teaching; and research regarding technology use by rural area students. The chapter closes by indicating that despite the vast number of cross-disciplinary pieces that comprise this body of research, the gap in the andragogy is that the technological inequity experienced by rural students in FYW courses had not yet been identified as an area of significance or subsequently studied, prior to this dissertation study. It is important to note that in this review and subsequent study, the language surrounding the use of practices and principles to integrate technology in a practical and ethical manner is nearly synonymous for both face-to-face and online learning environments. The premise for dissolving the distinction between face-to-face and online technological integration practices is due to updated language from scholars who have come to the resolution that the distinction no longer exists, something which is discussed later in this chapter.

Technology Integration into Composition Pedagogy

The integration of technology can be defined in a variety of ways but for the purposes of this dissertation, technology use in composition pedagogy is to be defined as *the use of digital devices (computers, tablets, phones, etc.), digital platforms (word processing and learning management systems (LMS) accessed on digital devices), and internet services as the primary mode of creating written texts*. Additionally, the terminology of computer, technological, and digital literacy are used somewhat interchangeably in this exposition, focused less on defining the device or platform, and more so on the level of ability students have in using said device or platform, drawing on the defining features of functional, critical, and rhetorical literacy, as theorized by Stuart Selber (2004) and discussed later in this literature review.

According to Bob Johnstone, the widespread use and acceptance of technology in education became prevalent in the early to mid-1980s in the United States (2003). It was, and still is, touted as the new frontier for education, enabling students to simultaneously learn a new skillset while producing relevant content that allows expression and connection of multiple literacies within a textually based medium (multimodality) (Serafini & Gee, 2014). The following is a brief overview of the history of technological integration into first-year writing (FYW) classrooms which begins to address some of the problematic hierarchical affirmations that technological integration has purveyed over the years.

Generally speaking, the use of computers and internet for writing study has been encouraged since the development of this technology. Beginning with the use of computers in the late 70s, colleges and universities implemented tools such as

word processing software and database research instruments, both of which have proven to be invaluable to college writing work as they have enabled students to achieve better time efficiency in writing and research, organization, and preservation of researched and written materials (Coley, 1997; Haas, 1996; Harris, 1987; and Winner, 1986). As the decades have passed, the technological elements in writing have widened into web-based digital writing, online coursework, new media studies, and multimodal assignment design using varied digital platforms (Alexander & Rhodes, 2014).

As noted above, technology has become an intrinsic component in the majority of composition pedagogy, something which is constantly evolving and changing based upon technological advances and student need. The documented array of uses and positive benefits of using technology for students and instructors alike are undeniable. In fact, there has been over a decade of research which calls attention to the importance of teaching using technology and multimodal work in composition, in both face-to-face and online courses (Hull & Nelson, 2005; Jewitt, 2006; Jewitt & Kress, 2003; Kress 2000, 2003; Kress & van Leeuwen, 1996). According to Hawisher and Selfe, a major consideration to weigh when including technology into composition spaces is the way in which technology and the expectation of multimodality change the responsibilities of teachers (1991).

How Technology Has Influenced the Responsibilities of Educators

As many composition instructors can attest to, teaching writing using digital platforms (in both online and face-to-face courses) is a delicate balance of technology use, classroom community building, communication, and organization. When entering a course about writing many students may not realize that they will need to have basic technological literacy in order to be successful in the class. To enable their success in a digitally integrated classroom, both the instructor AND the students must have a symbiotic relationship with each other, as well as with the mode of content delivery so as to effectively communicate expectations and difficulties. To put it plainly, this means instructors are responsible for teaching *both* the content of the course and the mode of learning, which includes not only the learning management system, but also any specialized technological tools used to teach content in the course such as Word processing tools. Meanwhile, students are responsible for learning *both* the content and the mode of learning as defined above. The following examines the responsibilities of instructors in digital technology integration and how, through meeting those responsibilities, students are enabled to meet their responsibilities for learning.

In order to discuss the responsibility technology integration places upon instructors, it is pertinent to consider two primary concepts: how can digital integrations embody pedagogical best practices for use in composition courses and what level of expertise should instructors have when engaging these digital tools in their classrooms. To further parse out the former concept, instructors should answer two questions before engaging the use of a technological learning tool such as an LMS or software program: does this serve the learning needs of my student

population? (usability) and, is this platform navigable and intuitive? (user-centered). In pedagogy focused around digital technology use, it is noted that foundational best practices include usability and user-centered design as some of the most integral aspects of multimodal learning that instructors need to contemplate (Ceraso, 2018; Selfe, 2007; Selfe 2009). According to Bartolotta, Bourelle, & Newmark (2018), it is crucial for instructors to be “active not only in the scholarship of usability and user-centered design in the composition classroom, but to become advocates for it in your classroom.” By centering classrooms on technological usability and user-centered design, instructors are helping to ensure that students, in general, will find relevance in the technological components of the course without finding themselves overwhelmed by the use.

The second concept noted above addresses the level of expertise in digital technology that is required for composition instructors prior to their deployment of said technology in their classroom. As was established earlier in this chapter, many online writing practices and principles that guide practical and ethical technology use in FYW are now applicable and, therefore, employed in both face-to-face and online learning environments, though the two types of instruction differ in various ways. Contrary to much of the multimodal pedagogy scholarship that encourages all writing instructors to be knowledgeable in digital tools and technology to the point of being able to teach these literacies, the 2nd Grounding Principle of OWI states that “an online writing course should focus on writing and not on technology orientation or teaching students how to use learning and other technologies” (2013). This statement, while sensible in its intent, is somewhat unfeasible in practice. If an

instructor is going to use technology as a teaching asset in their classroom and incorporate multimodal components to their assignments, teaching the technology becomes absolutely necessary, otherwise it places the onus of technological literacy and learning on the students, something I demonstrate is detrimental to their success in FYW courses later in this study.

Having established the need for FYW instructors to have a basis in technological literacy so as to be able to support their students' technology use, we are left wondering how much technological knowledge is enough? In the introductory chapter of her 2007 anthology, *Multimodal Composition: Resources for Teachers*, Cynthia Selfe discusses this concept by introducing and responding to five key questions from writing instructors, one of which asks if focusing on technology in writing instruction would significantly impinge upon the focus of rhetorically based writing instruction, and require instructors to become "technology experts." In her three-part response, Selfe suggests that while multimodal composition is not necessarily dependent upon technology, in the cases where multimodality does employ technology, instructors should consider starting "slowly and small," perhaps by making one assignment digitally multimodal or making the digital component to a multimodal assignment optional, so as to gauge effective multimodal assignment adaptations. Ultimately, however, Selfe encourages instructors to "seek their own level of comfort in digital communication environments" while also respecting "the full range of literacies that students bring to the classroom."

While Selfe makes some meritorious suggestions in her response to the question of how much technological knowledge FYW instructors need, there is a

caveat to her position: the concept of multimodality being incorporated into FYW courses via non-digital avenues is haply less cogent than it was in 2007; fifteen years later, *all* FYW classrooms assignments have a digital component in that they are, at a minimum, written and submitted via technological platforms. This ubiquitous use of technology in FYW indicates that instructors must have a basis of literacy in the technology that they expect their students to use, possibly extending beyond their “own level of comfort” as Selfe suggests. Other scholarship indeed dictates that instructors must be well versed in the technology on which they’re teaching and in the technology on which they’re expecting their students to create content.

For writing instructors, being able to incorporate technology as an instructional tool for multimodal composition has shown to have wide reaching, positive effects which support the theory of mind that technological and digital literacies play important roles in the development of agile writers who are prepared for the global workplace (Wen, 2022). These positive observations have led to technologically integrated instruction and multimodal pedagogy becoming foundational to composition pedagogy theory and study. Presently, in FYW courses, the majority of classroom access, writing, and research is now done through technological means. As such, common composition practices dictate that the rapid changes in technology influence every aspect of composition education including pedagogical study and curriculum development, classroom engagement, student assessment, and instructor/student communication (Beck, 2013; Hawisher, 1992; Miller, 2001; Palmeri, 2012). With this integration of technology in nearly every

aspect of composition study, there was, and continues to be, some parallel drawbacks to the benefits which come with heavy technological dependence.

In “Brave New Digital Classroom: Technology and Foreign Language Learning,” Robert Blake (2008) makes the argument that technology should be implemented in classrooms as early as possible, beginning in the elementary school years, so as to build a real-world skill set and digital literacy within the student population, preparing them to learn and work in digital platforms beyond their formal schooling. He also asserts that teachers should have a critical understanding of a variety of technological tools and utilize them effectively so as to transform the classroom into a digitally diverse space. Having teachers fully understand and be proficient in the digital mediums they’re teaching and having students become proficient in varied mediums sets them up to be successful in this ever-evolving technologically centered world. This is an important assessment to the field as many composition instructors are just that—solely composition instructors. There is often little training in digital mediums or technologies, and much of the knowledge is acquired through practice. I contend that if students are to be successful in their use of digital technologies, instructors first must become proficient in these technologies through professional trainings, self-study, and continuing education courses which focus primarily on our learning of digital mediums and technologies.

To simultaneously problematize Blake’s assertion, Pilar Alderete-Diaz’s “Translation, Technology, and Autonomy in Language” (2012) discusses the concept that while yes, teaching with the use of digital platforms and having students, particularly writing students, use technology in their work is necessary, doing so may

come at the price of their autonomy. Diaz comments that especially for L2 writers, maintaining a sense of autonomy and voice is difficult as writing in a second language may or may not feel stifling. Diaz argues that technology use may either help with this issue by making the students feel as though they're on an even playing field with other L1 students, or it may exacerbate a loss of autonomy because of the feeling of anonymity which often accompanies technology usage.

Diaz' paramount assertion comes at the end where she falls in line with Blake, stating that autonomy can be preserved by students if their teachers are proficient in the use and teaching of technologies in the classroom. Teachers and students alike should use each opportunity of technological learning as a means to enhance writing, not anonymize it. This again is where extra training or continuing education may be useful, by knowing the technology inside and out, instructors can then move forward in appropriate use of technology so that it aids in our instruction and students' learning but does not take over as the focus of the course or strip students of their individual writing styles and abilities. If rural area students are considered as non-digital natives or semi-digital natives, then much of their digital media learning will be akin to L2 learning. Learning a digital medium that is completely foreign is similar to learning a second language. New rules, norms, expectations, and skills are going to be required when learning digital technologies; if instructors consider digital learning as similar to L2 learning and use L2 pedagogy accordingly, rural area students may benefit by retaining more of the presented digital skills.

Carol Chappelle (2003), like Diaz, understands and addresses the many obstacles and opportunities technology use can have for those learning English or writing in English as an L1 or L2 student. Her piece “English Language Learning and Technology: Lectures on Applied Linguistics in the Age of Information and Communication Technology,” also like Diaz’, looks at both the positive and negative effects of using technology and digitally based teaching methods with students and examines if the positives (new skill sets, ability to compose in a variety of mediums, students’ familiarity with technology, etc.) outweigh the negatives (difficulty with learning new digital platforms, students’ focus being drawn to the technology rather than the writing itself, loss of autonomy, etc.)

Chappelle, again showing similarity to Diaz and Blake, asserts that it comes down to the teachers: instructors teaching the learning of English, whether it be reading, vocabulary, or writing, are responsible to learn the technologies, present them early in the class, revisit the use of these technologies throughout the class, and use it regularly. Chappelle states that many of the technology obstacles associated with English language learners/writers stem from inconsistent use of the technology, unclear or conflicting information regarding the use of the technology (instructor error or non-proficiency) and inadequate time to learn the nuances of the technology). If instructors avoid these pitfalls, the overall benefits of using technology in the classroom are apparent. Much like writing, the mastery of technology and digital platforms comes with practice. Therefore, it is imperative for instructors to move forward in their education, keeping up to date with the most current of developments in the platforms they use, and then keep the students

informed of the updated use as well. Consistency, current models of use, and reaffirming practice is the only way to assist all students in the use of essential digital platforms within composition classrooms.

According to Ronald P. Leow et. al (2016), “the degree of technological fluency is directly correlated to the learning completed on said technology,” something which reaffirms the assertions made by Blake and Chappelle. Like Blake and Chappelle, Leow’s article emphasizes the importance of instructors having fluency in digital mediums and utilizing them regularly in the classroom and a means of teaching the students how to use them. Leow goes as far to say that technology usage just be addressed as frequently as and as heavily as the language itself. The authors assert that fluency in digital learning thresholds is required to attain any degree of fluency in the language being learned or written because it plays a major role in the learning of the language (evaluations, readings, writing practice, etc.). This discussion is important to the field as it reasserts previous discussions on the importance of technology use in the classroom and by students. Much of the pedagogical practices which are helpful for L2 students’ comprehension of other languages can be used with other marginalized students since digital platforms are akin to an entirely new language. If students are comfortable and competent in their technological literacy, then they can focus more upon the writing at hand, rather than struggling to juggle the two learning experiences at once.

In *Insights into Technology Enhanced Language Pedagogy* by Anna Turula et. al, (2014) the authors also concur with the previous authors’ opinions on the absolute importance of digital literacy and competence being an essential part to

learning in a composition or language classroom. In this book, Turula et. al discuss pedagogical practices which enhance learning for students using digital platforms, including but not limited to “building, maintaining and managing the dynamics of groups working collaboratively online, frequently in intercultural contexts.” This is particularly important as students are not just writing in digital contexts, but also interacting with each other in these contexts.

Other scholarship indicates that without adequate training and knowledge on the part of the instructor, students may be able to hack their way through a multimodal assignment or an online course, but their content will suffer if the instructor is unable to provide adequate support due to lack of training and knowledge in the used technologies. Gee & Hayes state that learning to use technology is as much an academic literacy as is knowing how write effectively as is taught in composition courses (2011). According to Banks and Renwick, students only are able to produce quality content when their instructors are well trained in the technological platforms that are being used in the classroom (1997). To this point, when discussing composition courses offered strictly online, Andrew and Tiffany Bourelle note, “We believe it is imperative that teachers receive training in online teaching, where they learn to interact with students in meaningful ways and to provide a quality education for distance students” (2015). Though the authors’ primary focus here is on distance students/multimodal online instruction, their overarching assertion is that all FYW instructors should receive training in multimodal education for *both* face-to face and online learning environments, something which proved to be an apropos presentiment given how rapidly FYW

courses have evolved to heavily rely upon technological components, particularly in light of the pandemic.

According to Turula et. al (2014), the importance of facilitating interaction in digital platforms is just as important as teaching use of the technology because, as anyone who has interacted in a digital medium before knows, interpretations of communication can be misunderstood or misconstrued. Part of the responsibility of instructors, as is stated by the article, is to oversee these interactions so as to help students navigate issues of miscommunication, especially in intercultural contexts where along with language barriers, there may be cultural barriers to navigate as well. Being able to communicate effectively or “learn the etiquette” on digital platforms within an online or face-to-face classroom is essential to digital literacy which, according to both Turula and the other authors above, is essential to learning in both language and composition classrooms.

Many students may understand the nuances or have experienced miscommunication via a digital platform as many of them have engaged in social media of some variety. There are, however, students who have had little digital interaction and must be taught the conventions of digital communication. Just like in any other language, digital miscommunication can result in strife or argument, something which students must be taught to navigate. Training and knowledge in digital platforms can help students to avoid communicative pitfalls in their course of composition study.

In the final piece of this section, “Studies in Writing: Writing and Digital Media” by Luuk Van Waes and Marielle Leijten (2016), the authors take a more practical

approach to teaching digital technology in writing courses and instructors using digital technology by giving the audience actual pedagogical practices, tools, and suggestions for technology. Being a more practical piece, there are suggestions of software, techniques for instructors to use, and questions for further contemplation and research, some of which can be used for reflective assessment for both instructors and teachers.

The assertions by Van Waes and Leijten, though it doesn't outwardly state as much, demonstrates agreement with Blake in particular—the authors treat digital technology use as an inevitability and something students will greatly benefit in learning if it is taught responsibly, with regularity, and not used as a “crutch.” Students must still learn the conventions of genre, conventions of rhetorical situation (voice, tone, etc.), and how to implement those within the digital context presented in the courses. Finally, the authors assert that if these concepts are implemented, students should (theoretically) leave the classroom literate in all digital platforms presented, the language and writing required, and conventions of each genre presented.

The articles presented in this section are all very similar in nature and present a fairly unified ideology: students must learn writing in digital platforms to be successful in today's world, these platforms can be taught effectively by instructors in composition and language classrooms, but instructors must be aware of some obstacles students may face such as intercultural communication issues, access issues, and using digital media as a way to gain anonymity/lose autonomy. Instructors have the responsibility of facilitation of online/digital interactions,

consistent use of technology in the classroom, and regular instruction in the digital mediums presented in the course. The following section discusses how having a varied student population requires varied instructor pedagogy practices and recommendations, something which can often be assisted by digital technology use in the classroom.

Though there are a plethora of other skillsets and responsibilities that are necessary with the integration of technology into composition spaces, the aforementioned examples serve as a snapshot of these responsibilities. Using technology as a pedagogical best practice (and not just for the sake of using it) and ensuring instructors are appropriately adept at using the technology are crucial actions that instructors must take when integrating technology into their composition classrooms. To do so is a way of setting up their students for learning both the content of the course and the technological components necessary for accessing the course and creating the expected work required. Finding a balance between teaching the technology and teaching writing, however, is up to the instructor which must take into consideration the prior technological knowledge of students in the class. These examples of instructor responsibilities, despite being essential, are neither all encompassing, nor are they a foolproof way of ensuring student success, which is something discussed below in the section on problematizing technology use in composition classrooms.

Problematizing Technology Dependence in FYW

Previously, I discussed an overview of the power structures and hierarchies imbued within composition theory and I explored how some of those hierarchies were disrupted in the previous section. In this section, however, I will continue the discussion of power structures, but I will narrow the focus to digital technology as a component that, despite disaffirming certain aspects of collegiate hierarchy, often reaffirms these hierarchies in other aspects. One of the overarching goals of using technology in composition has been to better serve the needs of diverse student populations. Giroux and Freire (1987) noted that "...the need for critical educators and others to develop a radical theory of education in which it becomes essential to examine how diverse public spheres interact in shaping the ideological and material conditions that contribute to instances of domination as well as struggle." The use of technology in FYW instruction does in fact attempt to address the needs of dynamic student populations but it is also something which reaffirms instances of domination and struggle in certain student populations.

When the digital revolution began as was previously discussed, computer use became the hot topic in education. One of the most influential scholars in digital pedagogy is Marc Prensky. Prensky's pedagogical theories, despite them being written with K-12 education in mind as the primary focus, have been heavily cited in collegiate pedagogical theories and practices. In his articles regarding "digital natives" and "digital immigrants," Prensky asserts that there are two types of students today and that they can be divided thus: students who were born prior to 1985 are termed "digital immigrants" and those born after 1985 as "digital natives." Prensky's reasoning behind these labels is to note the very real differences between

students who grew up prior to the digital revolution in the 90's and those who grew up during or after the digital revolution. The theory of mind is namely that the "digital immigrant" (alternately termed as Net Generation) students would struggle more with technological integration due to lack of access in the early years of their educations, and that college classrooms should prepare for the influx of Net Gen students by integrating technology into the classroom (Prensky 2001; Prensky, 2001). This theory became integral to composition pedagogy and has substantially informed the foundations of online teaching. Unfortunately, this theory fails to consider several crucial components of student learning which has in turn created a learning divide, definitively classifying certain student populations into a binary and disregarding several important factors which can (had has) inhibited learning in a tech-heavy classroom.

Alongside the problematic pigeonholing of 'digital native' students' learning styles and needs, the terminology itself is controversial. The juxtaposition of the appellations 'immigrant' and 'native' as being at odds with one another invokes a negative connotation which implies a suggested superiority of 'native' students above 'immigrant' students. In their piece "The 'Digital Native' and 'Digital Immigrant': A Dangerous Opposition," Bayne and Ross (2007) examine this issue, asserting that the acceptance of this terminology into mainstream educational theory imbues students and instructors alike with hierarchical violence. To probe this subject under the lens of hierarchical violence, they discuss how Prensky's discourse highlights "the view of higher education as a commodity, its consistency with managerialist agendas, its tendency to marginalise the role of the teacher, the violence of its

hierarchical oppositions, its essentializing dynamic, and the underlying discrimination implicit in its metaphors.”

From the negative implications of his titles to the content itself, there is substantial dissent among educators regarding the narrow lens with which Prensky analyzes students. His binary definitions of ‘digital native’ and ‘digital immigrant’ fail to take factors such as socioeconomic status, race, generational poverty, and geographic location into consideration. Despite calls from other scholars to broaden his consideration of student needs outside their assumed knowledge of technology, Prensky doubled-down on his theories in his 2006 article “Listen to the Natives” where he also encourages teachers who are uncertain or uncomfortable with newer technology to simply ask their students. He writes, “Teachers can learn what technological equipment they need in their classrooms simply by asking students, and they can lobby to get these items installed in school computer labs and libraries.”

This statement comes from a place of privilege. First, it does not encourage the previously discussed pedagogical best practice of educators being well versed in the technology they’re using and teaching their students to use. Second, it does not consider that educators in the majority of schools, colleges, and universities in the United States are not in a position to make these types of requests. Financial constraints, structural requirements, IT support, and security regulations at the institutional, state, and federal are all ignored in favor of an impractical and vague call to action. Notwithstanding these problematic statements, many of Prensky’s

other suggestions and theories within this article have been adopted into mainstream digital composition pedagogy.

The picture Prensky's articles paint of student populations is not diverse; it is simplistic and non-dimensional. Despite there being holes in his assertions about technological integration in education, there has been wide support and use of Prensky's theories in academia. Smith (2012) notes that regardless of many of Prensky's notions being identified as problematic, "...several recent studies on digital learners continue to incorporate early authors such as Prensky but may fail to adequately consider current research painting a more complex picture of Net Generation students." In an attempt to confront some of the issues not addressed in the "Digital Native/Immigrant" theory of mind, below I discuss two major stumbling blocks that many students encounter: issues of access and issues of proficiency.

Issues of Access

Access is something which has long been a multifaceted and critical issue to address in the field of composition studies. Brewer, Selfe, and Yergeau (2014) expertly summarize the issue of digital access thus: “Inaccessible texts and spaces are deeply sedimented in our academic culture and structurally aligned along the axes of existing cultural formations—efficiency, capitalism, ableism, among other factors—all of which resist efforts affecting increased accessibility.” This statement serves to highlight some of the issues of accessibility within composition studies and acknowledges how technology plays into the academic hierarchy which excludes certain students. The article further notes that while some progress toward accessibility has been made with efforts from The Composing Access Project and The Committee on Disability Issues in College Composition, there is a long road ahead and many factors to consider in regard to accessibility in composition study in the future.

The crux of this issue is not so much that instructors are failing to recognize access as a problem; ask any composition instructor in a collegiate setting and they will have a story about a student who struggled or was at a disadvantage due to issues of access. For that matter, the access problem is something that has been widely discussed in composition studies for years (Willems, 2019; Peterson, 2001; Bancroft, 2016; McKee & DeVoss, 2007). While access is recognized as a significant issue and despite the ongoing conversation about this problem, it is one that has yet to be addressed at a pedagogical level. The central point of this issue should be, therefore, that there are no long-term, pedagogically based solutions to this problem. Funding for devices and accessibility services through universities are

merely band-aids. Real, tangible, proactive change must come from questioning the hierarchies in place which demand that students learn in this manner. This sentiment is echoed by Grabill (2003) who states:

“And yet, despite these efforts, our field too often remains attached to a vision of access that has more in common with helping the Other consume inaccessible texts than it does with radical transformation of the profession. A culture of access is a culture of participation and redesign. To put it simply: There is a profound difference between consumptive access and transformative access. The former involves allowing people to enter a space or access a text. The latter questions and re-thinks the very construct of allowing.”

This powerful statement is one which I feel is crucial to composition pedagogy scholarship. It calls out the hierarchical thinking that has permeated academia since its inception and while it is discussing issues of access in terms of being able to open, consume, and participate in digital texts within the composition classroom, I would venture to say that this notion is one which could, and should, be applied in a broader sense.

To exemplify this claim, while some students might struggle to gain access to PDF software or struggle to read texts on a digital device, I argue that many students also struggle with access to adequate internet access which is often required to access course materials/online platforms, not to mention the difficulty many face in accessing the technological devices themselves. Michael Apple, Ed.D., an educational theorist who specializes in education and power, cultural politics, and pedagogy theory brought this point up at the beginning of the technological revolution in schools, making an apt prediction that a required technological component in schools would inevitably further disadvantage large groups of students. He argued that the establishment of computer requirements and mandated

programs in schools would condemn many people to even greater economic disenfranchisement due to the cost of the privilege of technology. The students who could not pay this price would ultimately suffer (1991).

Issues of Proficiency

In conjunction with the issue of access, upon entering higher ed, students are expected to have basic computer, internet, and other digital literacies. The New London Group (1996) presented the “multiliteracy” approach in their article, “A Pedagogy of Multiliteracies: Designing Social Features,” as a means to didactically address the literacy needs of students in an increasingly globalized society. This approach uses the concept of design for modes of meaning, detailing not only linguistic meaning, but also visual, audio, gestural, spatial, and multimodal meanings, with multimodality as the unifying factor. This approach calls for educators to expand beyond the one-dimensional view of literacy as held by traditional, language-based approaches, and to engage with a more interconnected and multifaceted approach to literacy, something which is seen in more current composition and digital pedagogy theories and practices.

In concertion with the multiliteracy approach, according to Mallon and Gilstrap (2018), digital literacy extends beyond simply knowing how to access basic functions on the computer. They contend that:

“Digitally literate students know how to use computers and other technological devices, and they are familiar with the internet and social media. However, the parameters of digital literacy also extend to higher level competencies in content creation, data management, social collaboration and communication, and a learner’s ethical and social responsibilities in an online environment.”

If this definition of being digitally literate is in fact the inherent expectation for students, it is incongruent with simply having access. Amir Manzoor asserts a similar argument in his 2018 article “Media Literacy in the Digital Age,” stating:

“Many educators have been wary of the well-publicized hype about the unsubstantiated benefits of digital media in education because of their own real-life experience spending six hours a day with children and teens whose

lives are more or less infused with cell phones, iPods and laptops. They know that simply using digital media tools is no educational panacea.”

The assumption that students have functional computer and internet literacy is a privileged school of thought that stems from an educational hierarchy which supports the upper-middle class learning advantage. Stuart Selber (2004), breaks down computer literacy into three categories: Functional Literacy, Critical Literacy, and Rhetorical Literacy, stating that “Students who are not adequately exposed to all three literacy categories will find it difficult to participate fully and meaningfully in technological activities.” The students who are exposed to these literacies are, inherently, at an advantage over their peers, something which is not due to ability, but rather to access, a notion Michael Apple discusses in his 1992 article, “Computers in Schools: Salvation or Social Disaster?”:

“Students who already have computer skills--be it because of their schools or their homes--will proceed more rapidly. Their original advantage--not due to "natural ability," but to wealth--will be heightened. We should not think it odd that many parents, especially middle-class parents, will pursue a computer future. Computer skills and "literacy" are partly a strategy for maintenance of middle-class mobility.”

This proficiency barrier exists often because of socioeconomic factors; if a student cannot afford to own or access a computer, a printer, or the internet, they are placed at a disadvantage compared to their peers because without adequate access, there cannot be adequate practice and learning. Without adequate practice and learning, students cannot become proficient and digitally literate. This problem can snowball into something beyond academia and into students’ future livelihoods—credentials required by technological advancement are consistently raising an already unattainable bar for some in education. Without being able to

succeed and gain the credentials conferred by higher education, people who are already marginalized members of society are at risk of being further marginalized.

Burge, Haughey, & Spronk (2001) address this issue by saying:

“The credential factor here is considerable. In the past, as gains in schooling were made by ethnically different people, working-class groups, women, and others, one latent effect was to raise the credentials required by entire sectors of jobs. Thus, class, race, and gender barriers were partly maintained by ever-increasing credential inflation. This may be a latent outcome of computerization of school curriculum.”

This excerpt exemplifies the compounding access/proficiency issue in a way that I think is exceptional because not only do the authors recognize the social hierarchies and power structures that are reinforced by technology use in academia, they also identify marginalized student groups who may be at risk of this negative outcome.

While educators frequently, and often erroneously, assume that baseline computer, internet, and digital literacy skills are inherent to today's learners, the above excerpt demonstrates that there is recognition in the field that not all students will have the technological multiliteracy skills expected of them in FYW courses, and that those expectations can be marginalizing for students who do not have the necessary technological access to attain those skills. Many proponents of compositional multimodality have sought to address the issues of access and proficiency, suggesting solutions that would still incorporate the use of technology, but in a way that would be more widely accessible to students who may not have digital proficiency or consistent access. One such solution, as presented by Daniel Anderson, is the “low-bridge” approach to multimedia literacies. In this approach, writing instructors “rely on familiar literacies, free consumer-level software, and remix

uses of materials to facilitate student production of new media compositions” (2008). Additionally, the low-bridge approach calls for hands-on time in class so students can work together, under the guidance of their instructors, to develop technical skills in multiple literacies. Another solution, as suggested by Hewett, Bouelle, and Warnock (2022), is the implementation of supportive structures for students in composition courses. This solution proposes support measures such as teaching time management skills, face-to-face and virtual “writing centers” where students can go to write and get feedback on their writing (something which is referred to again in Chapter 6), instructional assistants embedded within the virtual course platform, and peer mentorship programs.

Additionally, there are other scholars who suggest that multimodal composition does not need to take place in digital platforms at all. Multimodality is officially defined as the use of two or more communication modes within a text (Jewitt, 2009), which may include the juxtaposition of written text with images, oral storytelling, song, video, or any other variety of communicative modes. In her book *Toward a Composition Made Whole*, Jody Shipka argues against “equating multimodality only with computer, digitized, or screen-mediated texts, which are often self-limiting”, urging those who teach composition to include a “hybridization of aural, visual, and written forms” (2011). To do so, she suggests the use of a “task-based” framework for composing, as defined in her 2005 article, “A Multimodal Task-Based Framework for Composing”, which encourages students to use goal formation to eke out the most effective media choices to best communicate the goals of their writing. While the premise of empowering students to compose in non-digital

multimodal modes is a good solution in theory, it fails to consider the issue that at its core, composition has become inherently digital as it strives to prepare students for writing in a digital era. For example, accessing a prompt for an assignment is usually done on a digital platform, such as an LMS, as is the submission and grading of such work. This concept is further demonstrated by the language used by Hewett, Bourelle, and Warnock (2022) as they re-define "digital composition" to mean composition in the current age where all composition takes place or incorporates digital and/or online elements.

While these solutions do so much work to address issues of digital proficiency and accessibility in a mindful and equitable manner, the issue of consistent technological access, especially for students who are unable to attain access due to socioeconomic constraints, remains a difficult problem to tackle. Even the concept of low-bridge and familiar literacies should be reconsidered; to assume familiarity is to assume some level of digital literacy and consistent technological access, a presumption that is, as this study demonstrates, inaccurate. In *We Got This*, Cornelius Minor (2018) reminds us that "education should function to change outcomes for whole communities." Furthermore, Anna-Margaret Goldman (2014) notes that creating a space of equitable accessibility is crucial for the success and empowerment of students who are marginalized.

Though composition pedagogy and writing classrooms aim to embody diversity, equity, and inclusion initiatives, the only way to reach this aim is to identify the problematic power structures and ideologies (including the ones we benefit from) within the discipline and disrupt them through expansion of equity solutions. As

digital pedagogy changes with evolution of technology, literacy educators and pedagogy scholars must continue to recognize and strive to make accommodations for the students who are struggling in the digital landscape that has been established in composition classrooms. For rural students who are more likely to experience digital inequity and exclusion, it is crucial that literacy educators examine the institutional and pedagogical expectations for technological proficiency and access, and consider reframing what constitutes as a “functional” or “familiar” literacy.

Educational Power Structures and Technology

When discussing socio-political implications that the digital revolution has had for education, it seems pertinent to address the power structures that technology has *disrupted*. To say that technological integration has been wholly detrimental and exclusive of students who are not “status quo” would be erroneous. Through the implementation of digital-centric pedagogy, the use of technology has magnified and promoted aspects of classroom diversity and the disturbance of certain harmful collegiate hierarchies that thrived for centuries. With this in mind, much of the pedagogical theory has centered the inclusion of technology as a means of creating equality and diversity in FYW classrooms (Gomez, 1991; Selfe & Selfe, 1994; McNabb, 1996; Santos & McIntyre, 2016).

A primary example of diversity and inclusion is the move toward the acceptance and use of vernacular and non-standard Englishes in FYW classrooms. Inspired by the Students’ Right to Their Own Language (1974), this desire for linguistic diversity, though it is not strictly the result of technology use, is something that is strongly supported with digital integration because the use of technological platforms (e.g. teaching web writing such as blogging), and varied hypertext encourages sundry dialectical ingenuity and variances not previously seen in pre-digital revolution student writing (Kress, 2009; Monty, 2015;). Encouraging students to discuss interests, discourse communities, and linguistic pride through technological platforms which allow for multimodal expression has shown to inspire and motivate students, engaging them in work that they feel is meaningful, suffused with acceptance and validation of their languages, heritages, and cultural

backgrounds, and communication styles (Hewett & Bourelle, 2016; Davila, Bourelle, Bourelle, & Knutson, 2017).

This branching out from the prescriptivist nature that is inherent in academia is one way in which digital pedagogy has helped to shift power from the founders of composition study to students. Learning to express themselves in this way, on platforms that have the potential to be wide-reaching, gives students the power to interrupt the status-quo in academia and demands that the varied experiences of all students be heard and weighed with equal value. This is, however, only one side to the coin; from the beginning of technological integration, it has been clear that technology, while beneficial in some respects, is also responsible for upholding historically problematic hierarchies within academia.

Conversely, in the late 80s it became apparent that minority and socioeconomically disadvantaged students were being further marginalized by the exclusive use of technology in university study (Giroux, 1992). The Hispanic Policy Development Project noted that 40% of Latinx students who dropped out of college cited lack of access to the necessary technology (i.e. computers, typewriting machines, etc.) as a reason for leaving university study (1989). Macmurdo (1988) and Holstrom (1996), in their respective articles, both note that college students from poor areas tend to lack basic computer literacy skills and perform more poorly in computer literacy testing as they have not had equal access to the technology as students from more affluent areas. Finally, Cynthia Selfe states that the “complex linkage between technology and literacy highlights the serious and shameful inequities it continues to generate within our culture and the public education

system, including the continuing presence of racism, poverty, and illiteracy.” (Selfe, 1999).

Furthermore, in a report to President Clinton in 1995, a panel of educators, scientists, computer technologists, and financial advisors stated that though computer and internet usage was becoming the norm for classrooms in primary, secondary, and post-secondary education, there were clear socioeconomic and racial disparities in the areas that were receiving grants and monetary allocations for this technology. The report continued to note that up to 90% of federal funding for classroom technology and internet access was going to wealthy, urban public-school districts and public universities, with the majority of students identified as Caucasian, something which clearly left minority, socioeconomically disadvantaged, and rural students severely under-funded for technological advancement in their education spaces (Harvey, 1995).

The reason this report is significant to current pedagogical practices is due to its contribution to the implementation of the Technology Literacy Challenge, a federal literacy project begun in 1996. This literacy project, according to Selfe, “redefined literacy and the practices recognized as constituting literate behavior in America” while it also “supported, and perhaps exacerbated, inequities in American culture” by making a literacy based in access a standard in American education (1999). Moreover, this project’s push for technological literacy fails to recognize the importance of multiple literacies while favoring a more singular, ill-defined literacy. It also neglects to examine the complexities of literacy education as it relates to race, ethnicity, socioeconomic status, and geographical location.

The above examples highlight the lack of access within non-white communities that are historically poor and rural, something which I argue persists into present day. The same exclusionary hierarchy established in Socratic and Aristotelian Greek educational models has survived and thrived through the institutional insistence on technology, something which is an expensive commodity that not every student has the means to access. The following sections look more closely at how intersectional pedagogy practices, such as cultural diversity and equity minded teaching, disrupt problematic power structures, while also highlighting the fact that there are students, particularly those who are coming from rural backgrounds, still falling through the gaps in these strategies.

Equity-Minded Writing Instruction

The considerations for diversity, equity, and inclusion in learning environments may seem as though they could be easily defined as *learning opportunities for everyone*, but the reality is that these considerations are dynamic, and complex, especially in the realm of composition and digital pedagogy. Hewett, Bourelle, and Warnock (2022) exemplify how important these dimensional accessibility and inclusion considerations are, especially on the part of writing educators, stating:

“...students have long come from various socioeconomic classes with different educational backgrounds and financial (dis)advantages. Students have long been of nontraditional ages and attended college for different goals and purposes. They have been English speakers where the home language is a heritage language or a dialect of English, and they have been immigrants who speak English as a second (or third or fourth) language. Moreover, although most students are neurotypical, others have learning challenges (e.g., autism; dyslexia; auditory processing, reading, or writing disorders) not always addressed in teacher preparation. Some students have physical disabilities that require space-and time-based accommodations. Some students struggle with aspects of their identity, including their ethnicity, race, or gender. Therefore, it is critical that educators pay attention to the access needs and inclusion of students, especially in composition classes in the digital era.”

Though these considerations are not all-encompassing, the authors demonstrate a keen awareness as to how diverse student populations require diverse thinking on the part of instructors in order for their needs to be addressed within the composition classroom. Keeping this mindset is critical in that it allows for growth and shift beyond the current considerations, and to further inclusivity, as instructors strive toward equity-minded pedagogy and teaching practices.

In the newly released *Norton Guide to Equity-Minded Teaching* (2023), Artze-Vega, Darby, Dewsbury, and Imad define equity-minded teaching as:

“...teaching as informed by principles, practices, and historical understandings that aim to realize equal outcomes among all students, with particular attention to the students of minoritized races and ethnicities.”

To expand upon this definition, the authors make note that while race and ethnicity are key considerations in equity-minded teaching, that they do fail to take into consideration the impact that certain factors of lived experiences have on student learning circumstances and abilities, writing:

“The inadequate categories of race and ethnicity fail to account for the nuances within each. And in some cases, students’ socioeconomic realities, gender, and familial experiences with college (among other factors) have a greater impact on student success than does their race or ethnicity. This was one of the reasons why throughout the guide we emphasize the importance of taking time to learn about the lived experiences and outcomes of the actual students we teach versus relying on our assumptions or generalizations.”

Similarly, in an effort to better describe the intersectionality of students who experience a disparity in technological access, there has been a push to implement more encompassing terminology. In her 2015 article “The Digitally Excluded Learner and Strategies for Success,” Virginia Garland writes,

“The term ‘digitally excluded’ urged educational leaders to provide more technology resources and training for teachers serving low socio-economic status students, minority students, English language learners, and students with disabilities.

At the time this article was written, the “students” to which Garland referred were generally elementary and secondary level students in public schools across the United States. Although this terminology has made its way into collegiate composition theory discourse, it is still not the standard term used to refer to the students who experience digital and technological inequities.

In discussing technology use as a means to advance equity and inclusion in the FYW classroom space, the authors stated the following:

“...when we want to be intentional about advancing equity—it's not always clear what we can or should do, and because online learning and teaching with technology are now ubiquitous we have also infused modality and technology considerations and guidance throughout the guide.”

While the authors discuss lack of real-time and in-person support as sites of inequity, they do not bring into consideration lack of actual access to technology as being a site of inequity. In fact, lack of technological access is not discussed at all in this guide. Despite this guide coming out this year, the underlying assumption that is communicated is that all students are entering university in a technologically equitable space, something that this study proves is just not true.

According to Kishimoto, one solution to promote equity in collegiate spaces, albeit in relation to the implementation of ant-racist pedagogy, is to for faculty to be aware of their social position within the academic hierarchy. She suggests instructors use critical self-reflection to examine how their teaching choices and practices reaffirm harmful pedagogies that keep vulnerable student populations at places of marginalization and inequity (2015).

While there is a plethora of research on equity-minded instruction and the push for disruptions in institutional power structures so as to precipitate the changes necessary to usher in equitable practices from the top down, presently, there are no pieces that look at student rurality from an equitable lens. Rather, the majority of this body of research looks at rural students in intersectional ways that, yes, acknowledge their existence within colligate classrooms and note possible divergencies from their urban peers, but most fail to discuss the ways in which their

rurality impacts their ability to achieve the prescribed outcomes for various courses. The following sections of this chapter shift from looking pieces that revolve around composition pedagogy and writing instruction, to the research that revolves around students themselves, first beginning with features that discuss diverse student populations in scholastic spaces.

Sociocultural Studies and Cultural Diversity in The Classroom

Supporting diverse student populations in the college classroom is a topic which has been addressed, readdressed, and studied for decades, particularly the role of L2 students in composition classrooms. In most recent years, there have been major strides toward inclusion rather than separation of these students from L1 classrooms, a move which benefits both L1 and L2 students as it creates a positive and varied classroom, enabling all to learn on an even keel. This presents a unique challenge if we are to consider digital literacy as akin to learning a new language; there is a new set of vocabulary, skills, and writing conventions associated with digital composition and, as will become evident, much of the teaching and learning styles which are applied to L2 students at present can be extended to all students learning digital technologies. The following pieces address diverse student populations in a variety of contexts: the teaching of diverse students, the needs of a diverse population, and how composition can be a unifying classroom for those of all walks.

Social Linguistics and Literacies: Ideology in Discourses by James Paul Gee (2012) is a book that “serves as a classic introduction to the study of language, learning and literacy in their social, cultural, and political contexts.” Specifically, in chapter 9 “Discourses and Literacies,” Gee discusses the concept of Discourses and the concept of literacy within particular discourses. He defines Discourse with a “Capital ‘D’” as:

“...composed of distinctive ways of speaking/listening and often, to, writing/reading coupled with distinctive ways of acting, interacting, valuing, feeling, dressing, thinking, believing with other people and with various objects, tools and technologies, so as to enact specific socially recognizable identities engaged in specific socially recognizable activities.”

He goes on to argue that Primary Discourses are those which serve as a basis for our interactions—they are the first language use ties we have with particular community members. If English is the example, the Primary Discourse of some may be a different dialect than Standard American Edited English such as AAVE, Spanglish, or another variant of English. Regarding students who have varied Primary Discourses in composition classrooms, Gee asserts that to be shunned or shamed for this Primary Discourse often means these students are labeled as lacking in literacy. This is why the general meaning of literacy is incompatible with modern composition classrooms: one cannot account for cultural or social ties in dialects of Primary Discourse. To hold varied Discourses to the standard of one particular standard for literacy is a form of institutionalized racism. The final assertion in the chapter is that New Literacy Studies, or the broader definition of literacy, uses Discourse analysis to recognize variability in Primary and Secondary Discourses. This allows for sociocultural acceptance within academia where those with a varied Primary or Secondary Discourse would otherwise be labeled negatively.

This whole book is a significant contribution to the field, though it is not primarily focused on rural area students, it does serve to help identify the needs of diverse students. This chapter in particular lays the groundwork for acknowledging varied student backgrounds, encouraging personal literacy for students, and implementing the idea of teaching Discourse communities as a form recognizing the personal speech communities of students, relating those communities to personal identity. It's a brilliant concept in that many instructors use the Discourse Community model so as to tap into the personal, relevant interests of the students. The concept

Gee presents not only does that, but it also assists students in recognizing the link between their personal language community and identity, re-affirming students' right to their own language, something which is an inherent tenant of teaching composition.

Cultural Diversity in Schools: From Rhetoric to Practice by DeVillar et al. (1994) is a piece which reinforces the concepts of diversity in language presented by Gee. Though it is not a primary text concerning rural area students, it still is pertinent to the research in that it encourages teaching practices that will best serve diverse student populations. The authors bring attention to the Anglo-American conformity model which essentially is the mode of teaching where the conventions and expectations are those of white, urban, upper-middle class Americans, something which fails students of diverse backgrounds. It serves to force assimilation, stripping students of personal identity and labeling them as "lesser" if they fail to meet these prescribed conventions. DeVillar writes:

"It is clear that the Anglo-American conformity model embodies the philosophy and practices that prevent integration, authentic communication, and cooperation among the diversity of groups within the common geographic and spiritual borders of our nation and that reinforce segregation, communicative semblance, and competition among us."

Much like Gee, DeVillar recognizes that the conventions presented in the Anglo-American conformity model are nothing more than a way to present institutionalized racism under the guise of helping "othered" students "fit in." He goes on to state how the latter practices would continue to impede social, political, and educational goals of particular American groups and that we as educators are responsible for disrupting the Anglo-American conformity model so as to be more

inclusive of *all* American students. This is what much of current composition pedagogy centers around: how to reach students of varied backgrounds and engage them in classwork without stripping them of their identities and forcing them to conform to outdated and inherently racist norms. The beauty of this book lies in its title: “from Rhetoric to Practice” because it encourages instructors to MOVE. Move beyond saying we need more inclusive classrooms and actually create inclusive classrooms through discussion, assignments focusing on identity and language, and disposing of the antiquated “correct” way to write.

Another piece which assists in helping instructors recognize diverse student language and populations is *Teaching L2 Composition: Purpose, Process, and Practice* by Dana Ferris and John Hedgcock (2014). This is an invaluable book for composition instructors as it defines the L2 student, discusses teaching strategies which are beneficial to L2 students, and provides guided support and tools for organizing, assessment, and more. Ferris and Hedgcock are some of the first to coin the terms L1 and L2, replacing the antiquated ESL term. L2 is a broader, more inclusive term which is more reflective of the varied backgrounds of L2 students, rather than the singularity that is “English as a Second Language” learners. Beyond their defining characteristics of L2 students, the authors discuss how to teach L2 students and enable them to learn effectively within college composition courses. They provide examples of how to assess reading comprehension, define abstract concepts such as genre, and the design of assignments which will be pertinent and rewarding for the students who write them. Another particularly useful portion of the book discusses assessment and how to provide effective feedback, prompting

teachers to help build autonomy through self-assessment. Much like the Diaz article in the previous section, Ferris and Hedgcock encourage autonomous learning through self-assessment, stating:

“students should be consistently and intentionally led through reflection on and critical analysis of their own writing...Self-evaluation activities help students become better readers and editors of their own writing; such work builds confidence as students become more aware of their own strengths and of their abilities to help themselves.”

This book is important to the present research as it demonstrates up-to-date terminology, new and tested teaching practices, and cohesive examples as to why this method of teaching is both appropriate and beneficial to L2 students within composition classrooms. Much of the authors’ assertions affirm that instructors have a difficult job; the need to recognize, enable, assess, and support L2 students is critical for their learning. If this book was required reading for composition instructors, the result of more tailored, supportive, and L2 friendly classrooms would be evident in current composition teaching. Again, if instructors look at digital learning as similar to L2 learning, then there may be more insight on how to incorporate digital technology learning without taking away time in the classroom from compositional study.

The “Language and Diversity” chapter from *Concepts in Composition: Theory and Practice in the Teaching of Writing* by Irene Clark and Betty Bamberg (2012) is a well-rounded extension of the points asserted in Gee, DeVillar, Ferris and Hedgcock. The authors assert that the standardized perception of language and grammatical rules are just that, prescribed perceptions. The feeling that something is “wrong” with a student’s written or spoken English is simply the instructor’s pre-

formed expectation based upon the conventions of Standard Edited American English. If a student does not speak or write SEAE with fluency and instead speaks a dialect such as AAVE or Spanglish, they should not be punished or labelled as illiterate since their personal language is weighted with the same legitimacy as SEAE, despite grammatical and structural differences.

Though this chapter is not necessarily “groundbreaking” or presenting new information to the field regarding multilingual or diverse English composition students, it does reaffirm the concepts presented by the previous authors and it does present the information in a different lens, one which breaks the information down into linguistic terminology. Because this chapter was written with a linguistics slant, it provides a different tone to the explanations, making it a nice way to round out the research of its predecessors. Though, again, the focus isn’t on rural area students, the authors’ assertions still relate to the struggles those from rural areas might face in a FYW classroom.

Technology Use by Rural Area Students

Moving on to sources that are more focused upon students from rural areas, “Living with Literacy's Contradictions: Appalachian Students in a First-Year Writing Course” by Sara Webb-Sunderhaus (2012) is a piece which actually pulls in a focus group of rural students from the Appalachian Mountains and examines their time in a FYW course at State University - Sciotoville. In the duration of this case study, the author was a “participant-observer” rather than an instructor, which meant that she sat alongside the 12 students in the course who consented to the study (out of 14) and participated in their discussions with them. The author found that during this case study, the concept of literacy, defined in this case as the ability to read, write, and communicate effectively, and the performance of Appalachian identity were inextricably linked. She writes:

“For these students, literacy practices were an important way to perform a romanticized Appalachian identity and create a sense of working-class solidarity (Everyone's trying to better themselves). What emerges from the Sciotoville students is a belief system about literacy profoundly shaped by their performance of Appalachian identity, a performance that, in turn, shapes their performance of an academic identity. For these students, their performance of an Appalachian identity that is neighborly and helps out others played a significant role in their development of another metaphor of literacy: literacy as communion. In this metaphor, literacy is a communal resource, one to be shared among friends and neighbors-including neighbors in the classroom so that all can advance from the unemployment office to the corner office.”

This piece is interesting and important to this field of study because it gives us a personified study of the practices which are being used to teach writing to rural students. The idea of identity goes back to the Gee piece, discussing the “traits” of a particular Discourse Community (in this case, the friendly, helpful nature of rural Appalachian communities) and how the performance of that identity might influence

the academic identity of the student. In her study, attendance was spotty, with several students missing weeks at a time due to farming and mining schedules. The result was that the students asked each other for help and in the end, several unintentionally plagiarized work from their peers as they struggled to catch up. Once the concept of plagiarism was explained, the students felt defeated, as though their natural inclination “to help” got their peers into trouble.

Many students coming from rural areas are first or second-generation college students; prior to their acceptance into college, the families may have been oriented to blue-collar labor and thus school may have been considered a luxury or unnecessary in regard to the needs of the family or community. Writing instructors must take these identities into account when constructing our classes so as to encourage these students navigate their personal identities and the literacies required in college level writing courses.

The final academic research piece in this section also focuses upon the needs of the rural student. “Rural Poor Students and Guidance” by Thomas J. Sweeney (1971) is an older piece in relation to the others in this section, but it provides a very simple breakdown of how being from a rural area, especially one in poverty, might affect the ability and engagement of the students within a college setting. Sweeney, speaking as a psychologist and college instructor, states that the need for understanding is crucial when teaching rural students because they are likely to have familial and work burdens which are not openly discussed, nor are they shared by their urban peers. Similar to the considerations examined by Webb-Saundershaus, Sweeney proposes that agricultural, communal, and familial strains

on rural students often result in poor attendance, lack of preparation (inability to complete homework or reading as per the schedule due to required participation at home, lack of sleep, tardiness, etc.), and financial constraints which might be reflected in the inability to purchase textbooks, afford nutritionally balanced meals, or acquire the necessary tools to participate in class (paper, pens, bookbag, etc.).

Though much of the requirements for class are outdated in this piece, the assertions Sweeney makes are still relevant: rural students of lower socioeconomic status may not be able to be physically present for much of the course and they may not be able to afford to study in a college setting (especially in present day) without major stress or major debt. This is something which must come into consideration, not just by instructors, but by department chairs and administration, those who assign incredibly expensive textbooks or require the use of a laptop or personal computer, and those who create attendance requirements which are nearly impossible for these students to maintain. The goal for universities is to retain its student population and see them through to graduation. If an entire section of the student population isn't being supported in their extremely valid needs and is being ignored by university administrations, department heads, and instructors, we are failing them as an institution.

In order to be prepared and successful, most college writing courses require basic computer literacy, knowledge on how to use products like Microsoft Word, how to attach a file to an email, and how to use the internet. But what if a student is coming from a community without internet access? What if their high school was too underfunded to have the most current version of Word? What if they didn't grow up

with a computer at all? How can students who are technologically underprepared be successful in composition courses (and in college, broadly speaking) without adequate access and technological preparation? These are questions that have been asked by many in the educational realm, but they seem to remain as little more than nebulous concerns with no clear answers. It is clear, however, that there is an equity dilemma when it comes to the rural student population, something that those in both education and U.S. federal agencies have been examining for the better part of the last decade.

According to the Federal Communications Commission in “Broadband Adoption and Use in America,” (2010) the main dividing lines for access to digital technologies are along socioeconomic dimensions such as income and education. These dividing lines are even more disproportionate in rural vs. urban areas, the FCC citing the following data:

“Rural Americans: Fifty percent of rural residents have broadband, a rate that reflects in part the older and less wealthy rural population but also the lack of available infrastructure. One in 10 rural American say they cannot get broadband where they live. That is more than twice the national average. Rural Americans with broadband, meanwhile, are as active as their urban and suburban counterparts in using the Internet for shopping and taking classes online, suggesting that they use broadband as a way to virtually access the benefits associated with urban or suburban living.”

Bringing this focus even closer to home, in New Mexico as of 2016, 22.6% of New Mexicans live in geographically rural areas and 33.5% live in a digitally rural area (Health Resources and Services Administration, 2021). It is to be noted that these populations overlap; 100% of the 22.6% geographically rural population do not have access meaning that in addition to this percentage, there are 10.9% of people

that live in urban New Mexico who still do not have access to broadband internet services.

There are two primary reasons why the 50 percent of Rural Americans do not have broadband at home or in a public setting such as a school or office place: cost to obtain services and lack of digital literacy, with cost being the primary factor. A total of 36% of those surveyed cited cost as the main reason they do not have access to high-speed internet at home, in a school, or in a business. This breaks out in the following ways:

- “34 percent state that internet service is unavailable where they live, and it would be too expensive to have lines distributed to their area.
- 2 percent state that the cost of obtaining a computer and/or paying for internet service has prevented them from use of computer or internet.
- 14 percent cite factors pointing to lack of digital literacy as the main reason they are not online. These include people who are not comfortable with computers or, for non-internet users, are ‘worried about all the bad things that can happen if I use the Internet.’”

The article goes on to discuss that the lack of use of computers in rural classrooms is usually directly attributed to funding—these schools cannot afford up to date technology, nor can they afford instructors to teach the nuances of digital technologies. This is applicable to all educational levels, K-12 and college level.

Though this does not directly discuss the educational implications of this access inequity, it does discuss possible reasons why rural area students struggle with using the digital platforms presented in college FYW classrooms, something that is further affirmed by the results on this study in Chapter 4 and 5. If 50% of rural homes in the United States are without any sort of digital access, then we can assume that approximately 50% of our rural area students are without access and have never been taught how to use the technologies which they’re required to use at

the college level. Connecting back to the Gee, Diaz, and Blake, diverse students need constant practice and immersion into digital technology in order to be able to use them as effective tools in composition courses. The problem instructors are facing is that some of these rural students are being immersed into digital technologies, college level writing, and the college experience all at once, often with little or no prior training.

Literature Review Conclusion

This compilation of literature achieved the intended purpose: it demonstrated the significant literature on teaching using technology as a tool in the FYW classroom; it then demonstrated the same depth of study available regarding the pedagogy and awareness practices necessary for teaching diverse student populations, focusing on rural students at the end of that section; and it ended by highlighting the lack of research regarding the use of digital technologies by rural area students in composition settings.

After reviewing the current research, it is evident that there is a gap here between the use of digital technologies in FYW classrooms and rural student learning. Rural students who have had limited or no access to technology are at a disadvantage in FYW classrooms, with instructors often being unaware of potential needs of this student population, as well as ill-prepared to spend the extra time it would take to get these student up-to-speed on the technologies being used in the classroom, with many opting to not take away from the time needed to teach the actual concept of the class: writing. The crux of this problem, I assert, is the assumption for baseline digital literacy and technological access being inherent in institutional, departmental, and classroom expectations, something that will be demonstrated, discussed addressed in the following study, results, and implications chapters.

Chapter 3: Methodology

This chapter details the specific procedures used to collect, identify, isolate, process, and analyze the data required to address the guiding questions (as discussed in Chapter 1 and reexamined below) and support my assertion that the rural student population experiences digital inequity disproportionately and is negatively impacted by the current technology practices and expectations held by first-year writing (FYW) courses. To begin, I introduce the institutional context and the ethnographic perspectives of rurality used when conducting this study. Both of these concepts greatly influenced the structure of this study, eventually becoming the framing principles with which the methods of data collection and analysis were designed and conducted.

Following the establishment of these framing principles, I discuss the specifics of my research design, the data collection procedures, and the data analysis methods. In these sections, I describe how approaching this study from a methodologically pluralistic perspective was crucial so as to create an authentic expression of these students' lived experiences. By centering transformative and emancipatory paradigms in this study design, it demonstrates how the use of mixed-methods research was able to provide an accurate and encompassing representation of this student population's experience in FYW courses, highlighting issues of power, privilege, and inequity.

To close this chapter, I explore the limitations of this study, identifying two primary limitations. I discuss the limitations in depth and assert that despite having identified these two primary limitations, it is concluded that neither limitation is

detrimental to the integrity of the study, neither are statistically impactful to the data set, and both open the door to additional opportunities for research and discussion in the future.

Institutional Context

It is a common expectation for university students to compose documents, create projects, submit assignments, do research, contact instructors, and more, all on various technological platforms and in various technological mediums (Beck, 2013). Additionally, it is often expected or anticipated that students enter the course with some sort of proficiency in using technology (Alexander & Rhodes, 2014). The expectation for students to have a basic understanding of digital literacy (as exemplified by Alexander & Rhodes above) is frequently based in pedagogical practices that have been informed by theories from those such as Prensky, whose problematic perspective of “digital natives” (as discussed in Chapter 2) is one-dimensional, failing to take issues such as access into consideration. With these expectations being practically ubiquitous in university writing courses, the idea of a “one-size-fits-all” approach to technology implementation should be examined with a critical eye as it is rooted in flawed pedagogical theory.

The University of New Mexico (UNM), where this study was conducted, serves a diverse student population, with the majority of students hailing from protected, marginalized, or other varied sociocultural backgrounds and demographics (The University of New Mexico, 2023). With more than half of the student population being classified as a first-generation college student, UNM was declared a First-generation Forward Institution in the spring of 2022 (Munoz, 2022). Additionally, UNM meets the Higher Education Act (2021) qualifications as a Hispanic Serving institution (49.4% of degree-seeking undergraduate students at UNM are Hispanic), a Minority Institution (53.1% of the total students enrolled are from ethnic minority groups), and a Minority Serving Institution (59.2% of the

undergraduate students are from ethnic minority groups) (Office of Institutional Analytics, 2022).

At UNM, all FYW courses fall under the Core Writing arm within the Rhetoric & Writing division of the English Department. The Core Writing course curriculum description notes that, “to succeed in college and beyond, students need to become agile writers who can adapt their writing to a wide variety of audiences, contexts, purposes, mediums, and technologies” (Department of English Language and Literature, 2023). This description implies that much like other universities in the U.S., writing students are required to have access to technology (laptops, computers, internet, etc.) in order to be participate in the course. While the English Department at UNM maintains a wonderfully progressive focus on incorporating diversity within the English Department (linguistic pluralism, in particular), outwardly, the institutional expectations for technological access and knowledge are no different than those of other universities in the U.S.

This observation is not a criticism of UNM, its Core Writing program, the Rhetoric & Writing division, or its teaching staff, and is quite the contrary. The UNM Core Writing program has striven to keep up with ever evolving technological advancements and digital pedagogy best practices, all the while taking into consideration the needs of its diverse student population. It still stands to reason, however, that many New Mexicans fall under the parameters identified by Pew Research Center that indicate technological access and digital literacy risk factors, including the nearly 30% rural population, the 19% living at or below the federal poverty level, and some of the poorest broadband internet connectivity rates in the

country (Anderson, 2018). My assertion, in this case, is that the rural student population was not specifically considered in the past because it was likely not previously known that the number of UNM students who may be affected by this type of digital inequity is significant. Through the results discovered during this study, it is my hope that UNM as an institution will begin the process of finding digital equity solutions, something I discuss more in-depth in Chapter 5.

Study Participants Defined

Part of bringing attention to the plight of this student population is to define them clearly and concisely. Simply, the subjects of this study were students who self-identified as being from a digitally and/or geographically rural area and were enrolled in an FYW course at UNM. To expand upon these defining features, it's important to differentiate the geographically rural from the digitally rural, while also discussing how those two rural populations can, and frequently do, overlap. In this study, the term *geographically rural* indicates students who are from rural communities, as defined by the U.S. Census Bureau (2016):

“ The Census Bureau’s urban-rural classification is fundamentally a delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau’s urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses. The Census Bureau delineates urban areas after each decennial census by applying specified criteria to decennial census and other data. The Census Bureau identifies two types of urban areas: ‘Rural’ encompasses all population, housing, and territory not included within an urban area.

- Urbanized Areas (UAs) of 50,000 or more people
- Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.”

Essentially, according to the Census Bureau, anyone who lives in an area that is smaller than an Urban Cluster of 2,500 is considered as being geographically rural. It's also important to note that not all students from geographically rural areas experience difficulty accessing broadband internet and digital devices, but they are more likely to experience issues of access and consistency than their urban counterparts due to prevalence of technological access being greater in areas with a proximity closer to an Urban Cluster or Urbanized Area (Anderson, 2018).

In conjunction with the population defined as geographically rural, the term *digitally rural* indicates students who are without or have limited broadband internet access, have experienced inconsistencies in internet and digital device access, and are from areas with populations that may be larger than the rural areas defined by the Census Bureau, but smaller than an Urbanized Area. These students have definitively experienced difficulty in accessing internet and/or digital devices in their homes either before college, in current era, or in both capacities. Herein is where the overlap of these two populations occurs: not all geographically rural students are digitally rural, and not all digitally rural students live in an area that meets the stringent parameters of geographic rurality, but there are students within the sampled group who do live with aspects of both geographic and digital rurality.

By clearly defining these two populations and identifying where they overlap, it illustrates specifically who these students *are* but, arguably more importantly, it illustrates who these students *are not*. These are not students who have consistent ease of technological access, they are not afforded the same digital privileges that many urban area students are afforded, and they are not inherently going to have the same understanding and digital prowess as those who have had consistent and reliable access to up-to-date technology. The purpose of defining these students is not to set them apart or “other” them, but rather to give them an opportunity for self-advocacy by speaking out about their lived experiences and how their FYW experience could be improved through small, conscious efforts toward creating more equitable learning spaces in academia.

Research Design

In her book, *An Introduction to Fully Integrated Mixed Methods Research*, Elizabeth G. Creamer (2018) defines the goal of the transformative-emancipatory paradigm in research as being,

“...driven to change or improve practice, whether it is in the classroom or outside of the classroom...distinguished by the overtness of its axiological commitment to address issues of social justice and its commitment to nonhierarchical methods... It places issues of power, privilege, and inequity at the center of all inquiry.”

When designing the research methodology for this project, I had two aims in mind: 1.) consider both the ethical and moral facets to this topic so as to ensure that the subjects did not feel patronized and that they were able to speak for themselves, and 2.) create a study that identified inequitable learning conditions, while defining the problematic institutional and pedagogical power dynamics that were integral in creating and maintaining these inequities, however unconsciously.

With student empowerment and the promotion of equitable learning as this as the basis for this study, I then had to consider what research objectives would best serve the needs of this student population, what data collection methods would enable me to ethically identify the rural student population within the FYW courses, and then what types of research questions would best elicit the most pertinent and candid information regarding their technology access and digital literacy. After reviewing the historical and current literature on multimodal composition and digital pedagogy, I defined the gap in the research as being that while there are demonstrated benefits to technology use in FYW courses, there is an inequity for rural students as they are more likely to experience inadequate access to and insubstantial literacy in the technology required to be successful in FYW.

With this gap being explicitly defined, the goal of the objective needed to be something that would take the conjecture that this inequity is seriously problematic for this student population and solidify it into a supposition that could be affirmed, and then addressed pedagogically and institutionally. To do so, the primary objective became to assess how self-identified, rural students are affected by the technological expectations for access and presupposed digital literacy in FYW courses. In conjunction with the primary objective, as discussed in Chapter 1, there were several guiding questions that this study aimed to address, if not answer:

- How much does early (pre-college) access to technology affect digital literacy within rural student populations?
- How does prior limited access to technology affect student confidence in FYW courses?
- Does digital literacy improve substantially alongside FYW literacies when learned in conjunction?
- Does this student population feel anxious about their performance in FYW courses due to their technological proficiency level?
- Does this student population struggle to understand and/or retain core information from FYW courses as a result of these access issues

As can be observed, all of these questions are focused around rural students and how *they* experience digital inequity. The lived experiences of the students who take these courses are foundational in defining the problem of digital inequity; indeed, this whole study is driven by the desire to identify the needs of this student population and implement educational interventions to their benefit. Per the aforementioned transformative-emancipatory paradigm as described by Creamer (2018), interventions and changes of this nature are “rarely effective without grounding in the needs, preferences, and interests of the constituents in a particular setting.” It is my hope that the data collected and analyzed serves as a starting point to promote tangible, equitable solutions for this student population.

Data Collection Procedure

Because this study was going to involve human participants, it was submitted to the UNM IRB office for review. After review and discussion, the IRB office determined that this study fell under IRB Review Not Required because this study serves as programmatic assessment (see Appendix B). At the start of the Fall 2022 semester, a survey (see Appendix A) was sent out to more than 500 students who were enrolled in a UNM Core Writing course. This survey was accompanied by a short e-mail to the students that discussed the details of this study and gave instructions on how to participate. The survey was composed of 10 questions that asked students to identify their status as being from either an urban area, a digitally rural or geographically rural area, or an area that encompasses both digitally and geographically rural parameters. It then asked about students' past and present access to and experience with broadband internet, digital technology devices, their general impressions regarding the technology requirements in the Core Writing course, and their personal feelings of preparedness for using the technology as described in the Core Writing course syllabus. Additionally, the survey provided a space for any additional comments the students wished to provide, such as notes to clarify or expand upon their survey responses.

This survey was disseminated via Google Forms and while it requested students' names and their student ID numbers, that information was removed during the data matching process (as described below), so as to anonymize and protect student identity. Once collected, the student surveys whose participants self-identified as being a geographically or digitally rural student were isolated for the

purpose of this dissertation assessment. The responses were then aggregated into visual graphs, all of which are discussed in depth in the results section.

At the end of the Fall 2022 semester, in their final portfolio essays, students were asked to respond to a more focused version of Core Writing's Student Learning Outcome F: Reflection. The addition (in italics) reads as follows:

“Evaluate your development as a writer over the course of the semester and describe how composing in multiple genres and mediums using various technologies can be applied in other contexts to advance your goals. *Additionally, please describe how you felt about learning to use these technologies. Were they a help or a hinderance to your development as a writer? Did they make achieving the SLOs of the course easier or more difficult? Do you feel as though your prior experience with technology adequately prepared you for the technological expectations in this course? Why or why not?*”

At the close of the 2022 semester, the instructors of the sections which participated in the study were prompted via email to provide the links to their students' portfolios, submitting them to a password-protected Google Drive folder. Upon collection of these final portfolio links, the student responses to SLO F were matched with the corresponding survey using the name and student ID numbers associated with both. After the surveys and portfolios were matched, they were, as previously mentioned, anonymized and assigned random reference numbers so as to protect student privacy. The entirety of the data set (all student surveys and SLO F responses) will continue to reside in the password-protected Google Drive folder where they can only be accessed for purposes in relation to this study, and where they will be retained for the required data-archival time period, post-dissertation publication.

Data Analysis

The data in this study was analyzed using mixed-methods, namely, quantitative and qualitative analysis, both evaluated through the lens of transformative-emancipatory paradigm, as defined above. In the survey, several of the questions requested responses that were ratings on a numerical scale. By utilizing said numerical scale on some of the questions, the data there was easily quantified into a descriptive and visual representation of the information, specifically as pie charts and graphs (see Chapter 4).

Within this section of analysis, concepts such as accessibility of technology, years of previous technological training, and scope of practice in digital platforms were assessed in a primarily quantitative manner, the summaries of which were broken down into student experience before taking the FYW course, experience during FYW, and experience after completing the FYW course, creating a quantitative comparative analysis that demonstrates the technological learning curve for this student population as they engaged with the content in FYW courses.

In support of the results derived from the expression of statistical and numerical data, the qualitative expression of student data analyzed in Chapter 4 embodied the core epistemology and methodology of the transformative-emancipatory paradigm. The aim was to collect data using interactive, nonhierarchical engagement with the students, giving them an opportunity to help define the problems they faced when using the expected technology in FYW courses, and empowering them to express what they felt would have been helpful solutions to the digital inequity they experienced.

The majority of the qualitative data was derived from the responses to SLO F in the student portfolios, but there were several insightful, candid comments on the initial surveys themselves that served to illuminate concepts not previously considered, such as one student having to complete the entirety of the course using apps on their smartphone, or how another student's lack of access went insofar that in addition to them having no technological or internet access in their home at all, they also had inconsistent electricity, something which was clearly a barrier to completing their FYW assignments to the best of their abilities. Using these statements as illustrative supporting evidence for my thesis statement, I also identified common statements among the qualitative student responses, aligning mutual key words, phrases, and expositions that threaded together collective hardships in FYW courses, and recommendations to address said hardships.

The combination of quantitative and qualitative data analysis in this study has proven to be a pragmatic means of effectively capturing the wide-screen view of the empirical data set achieved through the integration of these research methods. The use of quantitative analysis lends itself to the logical aspect of the data, establishing the *Logos* required in any scientific study. While the numbers are a clear, concrete answer to the questions posed in the earlier section of this chapter, they lack the personal, candid nature of *Ethos* that is then supplied by the qualitative data set, something that reaffirms this study's commitment to the transformative-emancipatory paradigm.

Limitations

For this project, two principal limitations have been identified, discussed, and justified below. The first principal limitation is that this study, while having been distributed to more than 500 composition students, was conducted at only one university, during one semester, and only uses the data from geographically or digitally rural, FYW students. This limitation is two-fold in that it isolates two distinct populations which may or may not have overlap: rural students and first-year students. While this study examines elements that are representative of how rurality affects the digital equity in new, incoming students, it fails to look at the broader view of students who may be struggling with digital inequity because they fall outside the rural or first-year parameters. Though students who come from urban or suburban areas and/or those who are in higher levels of writing courses (second-year and on) may still experience the negative effects of digital inequity, because only the data of rural, first-year students was assessed, the impacted students in other populations would not be initially recognized and, as a consequence, those students would not garner immediate benefits from any identified solutions that are implemented in relation to, or as a result of, this study.

This first limitation, however, was consciously considered and the choice was made to focus solely on the rural, first-year student population for a number of reasons. The primary justification for selecting such a narrow student population is due to the fact that they are the students most likely to be impacted by a lack of technological access and inadequate digital literacy. As detailed in the Census Bureau's Digital Equity map in Chapter 1, those who live in urban or sub-urban areas are more likely to have adequate access to internet and the other technologies

necessary for student success in composition courses. Furthermore, students in second-year or subsequent composition courses (students regardless of rurality status) will have discovered means of access and garnered aspects of digital literacy, simply by completing the FYW course requirements. While it is recognized that students outside of the sampled population may still be impacted by technological inequity, addressing the technological needs of rural, first-year students was identified as being more urgent as they have less recourse for technology resources than students who are urban and/or have already successfully completed their first writing course.

Additionally, this study was narrowed to focus upon the first-year population so as to identify digital inequity earlier in these students' collegiate careers. This was done so with the hope that should there be solutions identified to help with rural inequity, these solutions could be implemented preemptively, thereby lessening the digital burden on this student population, and shortening any periods of digital inaccessibility or illiteracy they may experience. Finally, in relation to the above rationales, should the hypothetical solutions prove successful for rural, FYW students, it can be reasoned that those same solutions may be implemented to the benefit of both rural and urban composition students in second and subsequent years who still experience the effects of digital inequity.

The second principal limitation identified in this study is regarding how geographic and digital rurality was identified in the student population. Within the survey (as detailed above), the initial line of questioning that was sent to more than 500 FYW students asks them to self-identify as geographically and/or digitally rural,

and only the data sets from those who self-identified as rural were assessed for this study. The justification above as to why rural students were selected for assessment still applies to this second limitation, but this limitation also requires a discussion of how this type of question affects the statistical data results in terms of a margin of error.

The use of self-identification in research can be inherently flawed due to the personal perspective of the subjects. While there are parameters in the survey to define and measure both geographical and digital rurality, asking students to identify and attribute these specific characteristics to themselves means that their responses are open to factors such as their understanding and interpretation of the parameters, and knowledge about their communities (i.e., population size). Because this type of self-identification question is interpretive by nature, there is always the possibility of inaccurate responses by the subjects, something which had to be taken into consideration as number of rural students may be higher or lower than the surveyed sample indicated.

To address this limitation, the resulting data from this question was analyzed using statistic expressions that assayed the margin of error and standard error of the responses received. As will be discussed in more depth in the Results section, because the students surveyed are a sample rather than a census of the student population, there will be variability in the data estimates, especially since the surveyed characteristics of rurality are open to interpretation. This type of analysis measures the statistical accuracy of the surveyed responses, thereby somewhat

mitigating the risk of erroneous student responses having a statistically significant effect on the accuracy of the data results.

Though these two limitations are significant, the solutions presented to address them in this study have served to underline that they are not unsurmountable; they do not compromise the statistical significance or integrity of the results and they open the door to further research possibilities. In the future, should digital inequity for rural students become a central discussion point in composition pedagogy, this study might serve as a basis for expansion to larger sample sizes or longitudinal studies that would enable the implementation of solutions for digital inequity in writing courses, giving these students the opportunity for success in writing courses that they are entitled to.

Methodology Summary

In closing this chapter, it has been established that this student population and their need for technological equity, as they have defined it, is the driving force behind the methodological theories and research methods used in this study. The method of study design, data collection, and data analysis all stemmed from the ability to adequately define the student population, and deeply examine the *why*? Why are these students significant? Why is addressing their inadequate digital access important? Why should we question and possibly overturn decades of digital pedagogy and multimodal composition theory, just to serve this student population?

Speaking from the perspective of social and ethical responsibility theory, the onus of elevating others to a position of equity lies with those who find themselves in positions of power, privilege, or advantage (Bayless, 2022). This study is just the beginning call to deliver a more equitable learning experience for this student population, but the data herein will show that it is a call worth considering for those who want to advocate for pedagogical inclusivity and equity in FYW spaces.

Chapter 4: Core Writing Technology & Rurality Survey Results

Results Conspectus

The following conspectus provides a detailed overview of the defining research elements present in both the Core Writing Technology & Rurality Survey results expressed in this chapter, as well as in Student Portfolio Reflection Response results as found in the subsequent chapter.

Defining Research Question

- Do the technological requirements and expectations in first-year writing (FYW) courses negatively impact rural student success in said courses?

Defining Research Terminology

- *First-Year Writing (FYW) Course*: writing courses offered by the University of New Mexico's Core Writing division of the English Department which include:
 - English 1110: Composition I
 - English 1110X & 1110Y: Composition I: Stretch I & II
 - English 1120: Composition II
- *Technological Requirements*: as defined in the course syllabi for FYW courses, the Technology Requirements are to have access to the following:
 - Internet
 - UNM e-mail address
 - UNM Canvas
 - Microsoft Office
 - Zoom
 - Other applications or digital tools as assigned by the instructor
- *Technological Expectations*: the expectation of access to digital devices, as well as the digital literacy to adequately use said devices, that would enable students to meet the Technological Requirements in FYW courses
- *Rural Student Success*: the ability for rural students to complete the required activities and assignments in FYW courses

Data Collection and Analysis Procedure Summary

The data analyzed for this study was comprised of student survey responses and student final portfolio responses to the Student Learning Outcome Reflection prompt. In August 2022, the survey was sent out to more than 500 students enrolled in FYW courses at UNM, of which 201 students responded. The data collected from those 201 survey responses was then matched with the data from the student final portfolio essay responses that were collected in December 2022. The matched data sets were then anonymized so as to comply with FERPA regulations (2020) in protecting student personal identifiable information.

The data analysis was conducted using a using mixed-methods approach that was built upon a transformative-emancipatory paradigm framework. In breaking down the analysis approach, this chapter examines and summarizes the responses to the survey questions, expressing the first nine quantitatively so as to numerically indicate the significance of these findings, using the optional comments students provided in Question #10 to serve as supporting or clarifying remarks for the preceding quantitative data. Chapter 5 connects the quantitative survey findings within this chapter to the qualitative findings that were gathered from student responses to Student Learning Outcome F within their final portfolio projects, the prompt and other defining features which will be discussed in further detail within the overview of that chapter.

Survey Response Data Analysis

Survey Questions #1 & #2

- *Would you consider yourself as coming from a **geographically rural** community? This is defined as a community with fewer than 2,500 people in a widespread or small localized area.*
- *Would you consider yourself as coming from a **digitally rural** community? This is defined as a community that is without or has limited access to broadband internet, but is not an urban community (meaning, the population is fewer than 50,000).*

The first two survey questions (as listed above) were the first means of identifying the rural student population. The response options to these questions were a standard Yes / No multiple-choice format, but with an added note that students could provide a comment on their selection choice in the provided comments box, should they feel the need to do so. The reasoning behind providing a comments box in each of these first two questions was in anticipation of any students who did not know the specifics of their community's population or broadband internet accessibility but did know that the areas they resided in did not qualify as urban.

After aggregating the responses from the first two questions (see Figure 3), it was determined that of the 201 survey responses, 135 students identified as being from a non-rural (urban) area through their selection of the 'No' option on both questions. The remaining 66 students identified as being from a rural area by selecting the 'Yes' option on one or both of the first two questions. This resulted in 67% of students identifying as being from urban areas and 33% of students identifying as being from a rural area, the sub-groups of which will be discussed under Survey Question #3.

While there were no comments provided from any of the urban student responses, several of the students who identified as rural in either or both questions noted that they were either unsure of specific population numbers for their hometowns, or they gave a description of their place of origin to show alignment with the parameters set for geographically and/or digitally rural areas. For example, Student 3 (who identified as geographically rural) wrote, “I’m not sure if the population of my hometown is less than 2500 people but I know it’s really close to that.” Another response from Student 132 (who identified as geographically rural) stated, “I’m from an area about 12 miles outside <<redacted town name>>, which is a larger town but is relatively isolated from other cities and makes it to where internet and cell phone reception is spotty and slow.”

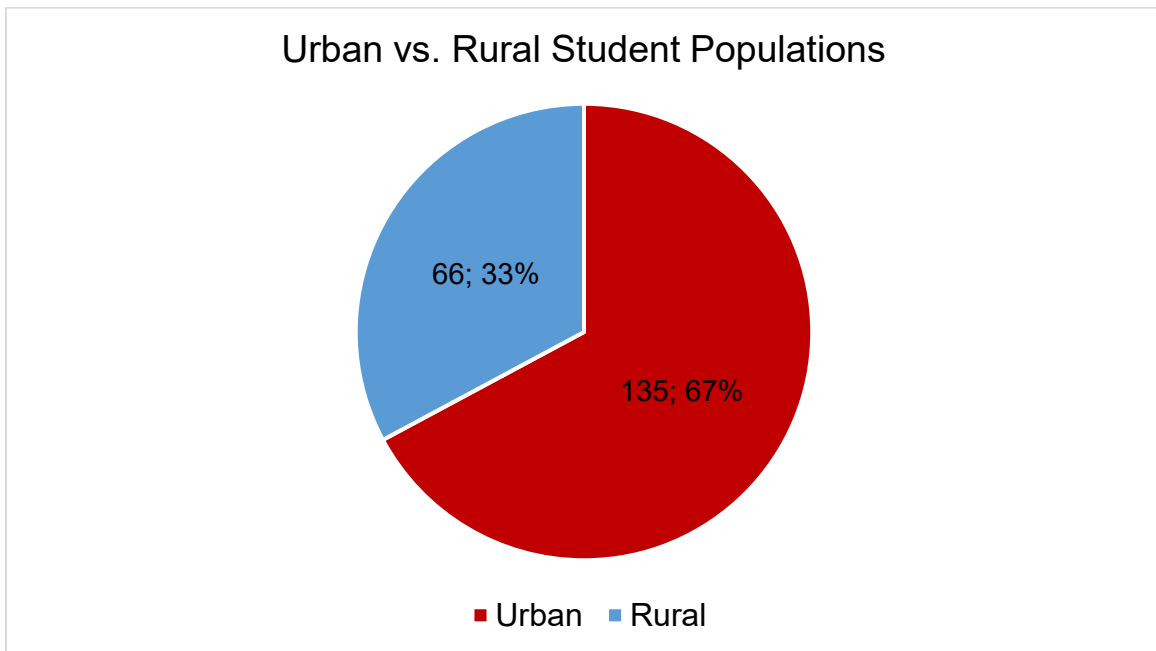


Figure 3: Summary of data points from Survey Questions #1 and #2, denoting how many students self-identified as being urban or rural.

Recalling the Digital Equity Act Population Map (2021) cited in Chapter 1, 39% of New Mexico’s population currently resides in a rural community. The 6%

difference between the rural population data figures reflected in the state data versus this study's data can be attributed to the fact that though they have comparable demographic features, the sample size of surveyed students at UNM is significantly smaller than the sample surveyed for the 2020 Census, which is the basis of the data cited in the Digital Equity Act Population Map. Even with the vast sampling size difference, the resulting rurality figures from this study's survey results is commensurate with that of the figures as cited by Digital Equity Act Population Map. The distribution of these percentiles is consequential because it demonstrates that despite the smaller scale of this sampling, the rurality demographics of the student population taking FYW courses at UNM is closely aligned with New Mexico's current rural population distribution. This finding is significant because it indicates that more than a third of the students in FYW courses at UNM are from either a geographic, digital, or mixed rurality area, the implications of which will be discussed in more detail later in Chapter 6.

Survey Question #3

- *If you identified yourself as being from or living in a digitally or geographically rural community, please identify if the area you are from is digitally rural, geographically rural, or both. If you are not from a digitally or geographically rural community, mark N/A.*

The multiple-choice response selections for this question were in the format of A / B / both A and B / neither A nor B, meaning students were able to align their communities with the characteristics of geographic rurality, digital rurality, both geographic and digital rurality, or neither geographic nor digital rurality. All 135 students who self-identified as being from urban areas in Questions #1 and #2 selected the 'Neither' option, meaning the number of urban vs. rural students was the same in this round of responses. Of the remaining 66 students who self-identified as rural in Questions #1 and #2, 28 students identified as being from a geographically rural area (14%), 15 from a digitally rural area (8%), and 23 identified as being from an area of mixed rurality (11%), meaning they identified with the parameters of both geographic and digital rurality, as is illustrated in Figure 4.

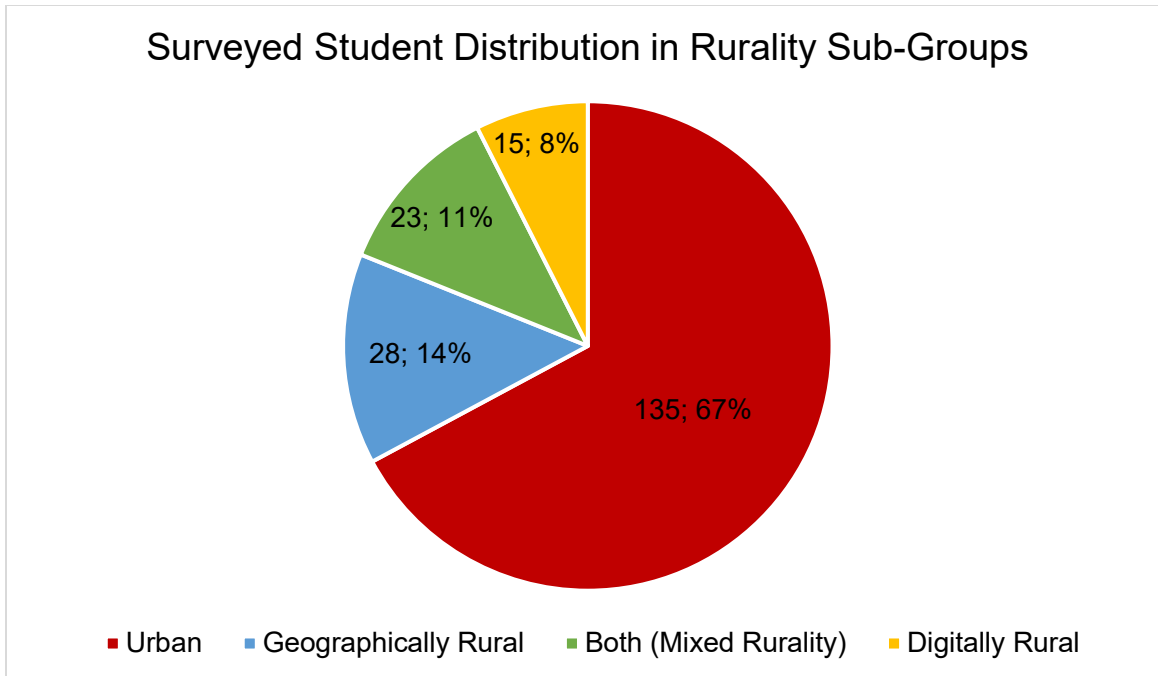


Figure 4: Breakdown of the number of rural students identified to each rural sub-group.

The purpose of this third question was to ascertain the distribution of the rural student population identified by the results of Questions #1 and #2 within the sub-groups of geographic rurality, digital rurality, and mixed rurality. The intent of dividing rurality into these sub-groups is to illustrate the differing characteristics of geographic rurality and digital rurality as defined in Questions #1 and #2, while recognizing that these two groups can, and do, overlap into mixed-rurality.

As seen in Figure 5, geographically rural students, at 42% of the rural student total, make up the largest rural student sub-group. This is followed by mixed rurality students at 35% of the rural student total, leaving digitally rural students as the smallest sub-group at 23% of the total rural student population.

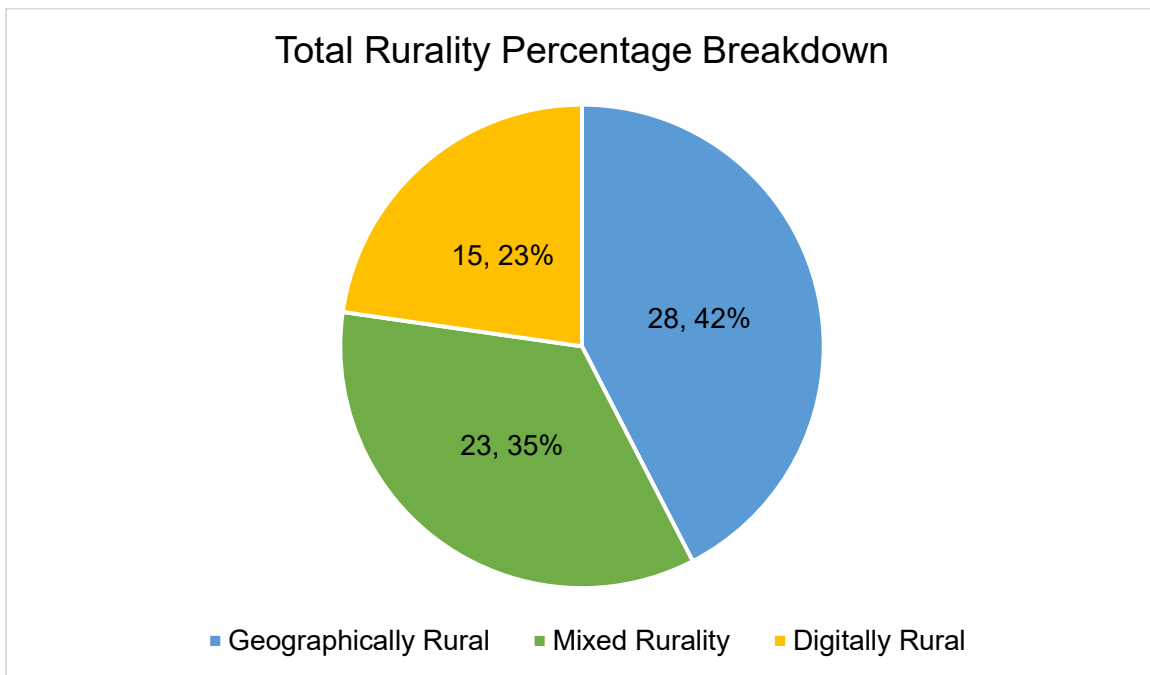


Figure 5: Breakdown of rurality sub-group percentages as they relate to the overall rurality number.

In defining these three distinct sub-groups, it allows for the delineation of the principal technological access issues that affects each of these sub-groups, while detailing where those issues overlap, framing the suggestions for remediation presented in Chapter 6. As such, the rural sub-groups will be represented separately in several graphs, charts, and other visual data representations.

Survey Question #4

- *Before attending UNM, did you have **consistent** (daily or as needed) access to technology? Technology refers to computers or other similar devices (cell phones, smart phones, tablets, etc.).*

Question #4 was designed with simple Yes / No choice response options, because while it is a subjective question based upon student recollection of their own lived experience, it's one that is definitive: either the students surveyed had consistent access prior to entering the university, or they didn't. The responses to this question were compelling. As seen in Figure 6, of the 135 identified urban students, 130 (96%) reported having had consistent access to technology prior to entering UNM, with only 5 urban students (4%) reporting inconsistent access to technology prior to beginning their collegiate careers. Conversely, of the 66 identified rural students, 27 (41%) reported that they had consistent access preceding their enrollment at UNM, resulting in 39 (59%) rural students reporting previously inconsistent access.

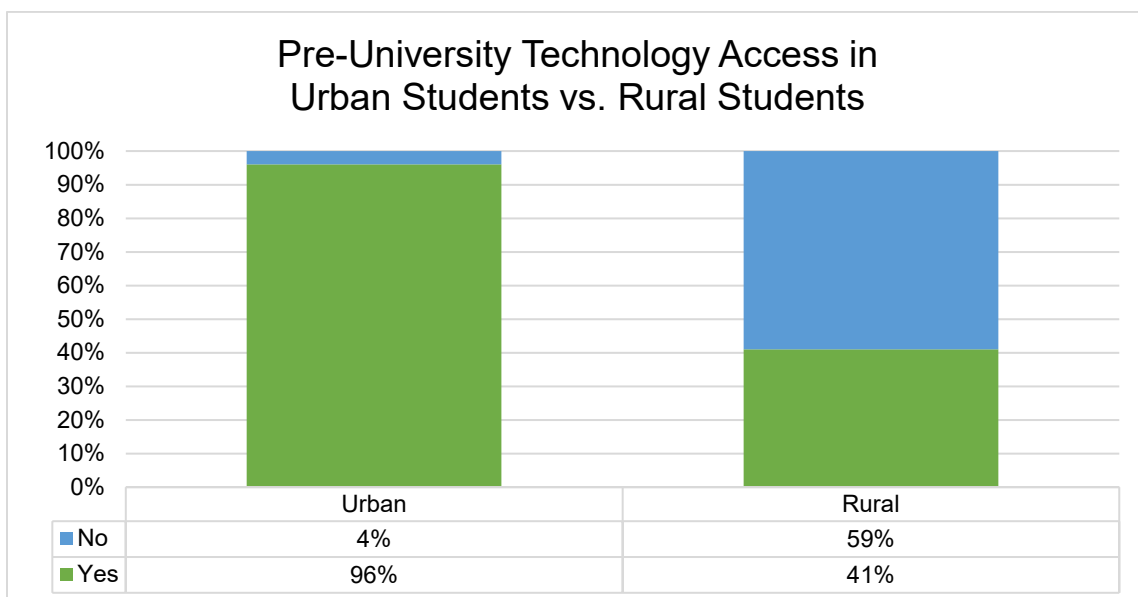


Figure 6: Representation of technological device access disparity between urban and rural students prior to their enrollment in university.

This finding is significant because it shows a substantial disparity in technological access between the surveyed urban students and rural students. According to Anzera and Comunello, the digital divide resulting from unequal access to technological devices that is rooted in socioeconomic or demographic gaps has a direct correlation to substandard digital and media literacies (2018). With more than half of the surveyed rural students reporting inconsistent access, it can be inferred that their digital literacy is diminished in comparison to that of their urban counterparts, who had less than 5% reporting inconsistency in access.

When examining the responses of rural students in their identified subgroups, it was discovered that those in the geographically rural sub-group were nearly twice as likely as those in the digital or mixed-rurality sub-groups to have had inconsistent technological access prior to college, with 27% of geographically rural students responding ‘No’ to this question (see Figure 7).

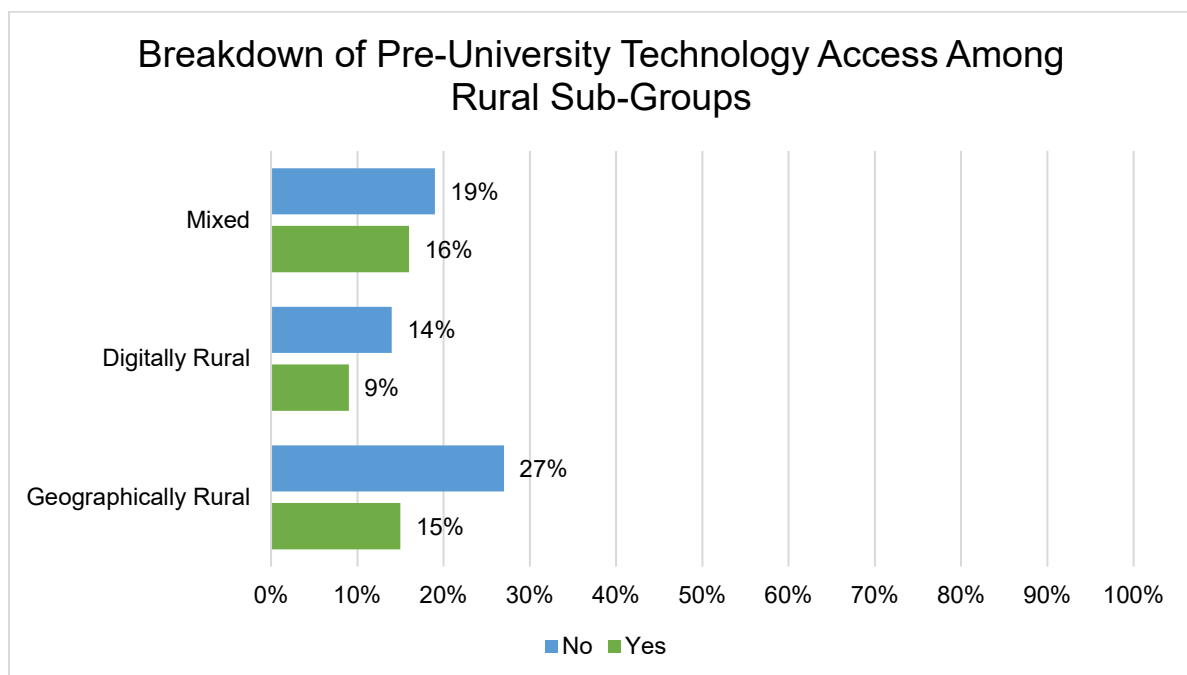


Figure 7: Pre-university technological access distribution in rurality sub-groups.

This result serves as substantiation of the report from the Pew Research Center where 30% of those surveyed rural residents cited distant proximity to an urban area with vendors who sell and repair technological devices being a substantial barrier to their ownership of a computer, laptop, tablet, or smartphone (2018). For the students who are geographically rural, it can be reasoned that their distance to an urban area where they can shop for, purchase, and take devices for repairs may be a barrier as to why they did not have consistent access prior to enrolling at UNM.

Survey Question #5

- *Before attending UNM, did you have **consistent** (daily or as needed), **dependable** access to the internet? Dependable refers to internet that had no or very few outages and maintained adequate speeds with minimal lag.*

Question #5, akin to Question #4, was posed in a way as to ascertain the disparity between urban students and rural students in the level of access they had to the internet prior to enrolling at UNM. It was also presented in a Yes / No choice response format and for the same reason as the previous question—either students had consistent internet access, or they didn't. As is seen in Figure 8, the statistics of urban student internet access was consistent with that of their technology access at 93% for the former and 96% for the latter. Rural students, however, reported having even less access to the internet than they had to technology, with only 20% responding 'Yes' to Question #5 on the survey.

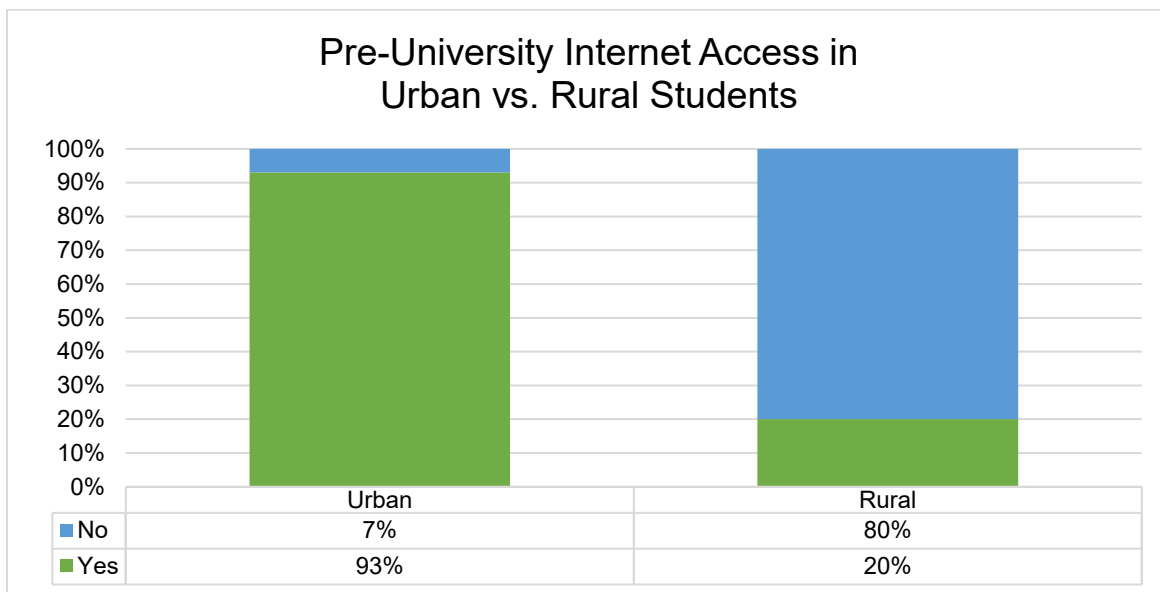


Figure 8: Representation of internet access disparity between urban and rural students prior to their enrollment in university.

The contrast of access to consistent internet between urban and rural students is quite stark in the data depicted in Figure 8, especially considering it illustrates that the access inequity between these two groups is even greater for internet than it is for technology. As previously cited in the Pew Research Center report (2018), 24% of rural residents in the United States expressed that getting access to high-speed internet is a major problem due to their location. Furthermore, those residents were reported to be 20% less likely to own a computer or smartphone than those living in urban areas, something that 60% of respondents attributed to lack of internet access (in addition to the aforementioned 30% who cited distant proximity to vendors as a reason). These statistics are mirrored in the data collected during this study and, as such, it should be considered that some of the rural students surveyed would also likely cite lack of internet access as a reason for abstaining from owning a computer or smartphone.

In dissecting this data into the rural sub-groups (see Figure 9), inconsistent internet access affected all three sub-groups similarly, but the reported lack of consistent access appears to affect digitally rural and mixed rurality sub-groups more disproportionately than the geographically rural sub-group. Though the 21% of digitally rural students who reported inconsistent access is a smaller percentage than the 29% and 30% of mixed rurality and geographically rural students respectively, digitally rural students only make up 23% of the total rural student population. This means that 91% of this subgroup was affected by inconsistent internet access prior to entering college, while 82% of mixed rurality students and 71% of geographically rural students reported inconsistent internet access.

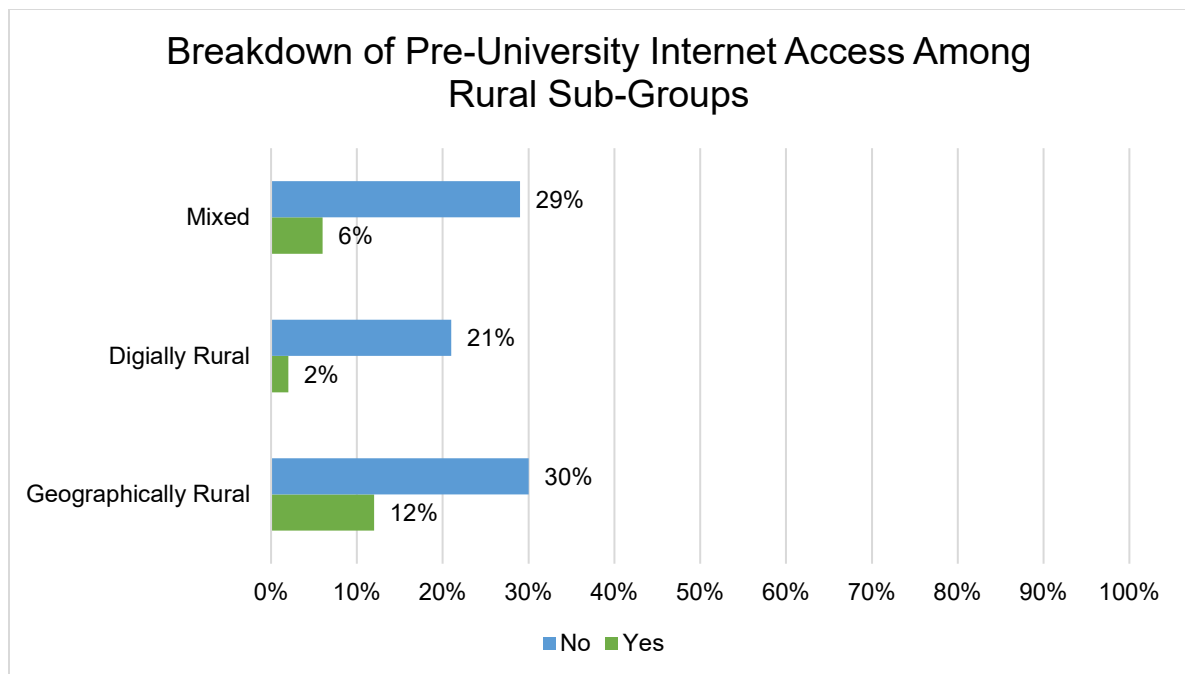


Figure 9: Pre-university internet access distribution in rurality sub-groups.

Per Ferreira, Ponte, Silva, and Azevedo, inexperience with the internet makes achieving digital and technological literacy difficult, if not impossible, due to the absolute dependence of most applications and programs on the internet (2018). The indication of these results is that because all three sub-groups, especially those who fall in the digitally rural sub-group, face instances of internet access inequity at much higher rates than their urban peers, they are less likely to have adequate internet experience and more likely to be affected by digital literacy gaps. The implications of this access inequity will be addressed more in depth in Chapter 6.

Survey Questions #6 & #9

- *Before attending UNM, did you receive training or education on how to use computers or the internet?*
- *On a scale of 1 to 5, how confident are you in your ability to use the technology required for this FYW course? This includes your ability to use both the digital tools (ex. the internet, UNM Canvas, etc.) and the technological devices (computer, laptop, etc.) as cited in the course syllabus or as directed by your instructor.*

The intention of Question #6 was not only to investigate the levels of prior student technology education in formal settings, but also to explore the levels of informal technology education. Students were asked the above question, with the response options being that they either received education at school, from a parent/sibling/other family member, from a public resource (such as the library), taught themselves via external resources (books, video tutorials, etc.), or they received no education prior to enrolling at UNM. The reason for ascertaining where students received their education on using computers and the internet was not to evaluate the accuracy of such education, but rather to propose two concepts for consideration in regard to formal education. Namely, its accessibility for rural students and its effect on student confidence.

The first concept considers if urban students are offered formal technological education with more regularity than rural students. According to the New Mexico Public Education Department (NMPED), at present there is neither a statewide infrastructure nor a computer science/literacy requirement for K-12 schools in New Mexico (2021). Additionally, according to the New Mexico Higher Education Department, there is no requirement for computer science/literacy to be part of the undergraduate core curriculum at any university in the state (2023). As can be garnered from Table 1, nearly half (47%) of the surveyed urban students received

some sort of school-based formal education in technology, while only 17% of surveyed rural students reported receiving school-based education on technological devices and the internet. In relation to formal education, only 4% of urban students reported receiving no prior technological education whereas a substantial 38% of rural students did not receive any education in technological devices and the internet prior to enrolling at UNM.

Table 1: Prior Student Education in Technological Devices & the Internet

Response Selections	Urban Student Response	Rural Student Responses				Urban %	Rural %
		Aggregated Rural Total	Geographically Rural	Digitally Rural	Mixed Rurality		
Yes, at school	63	11	5	3	3	47%	17%
Yes, from a parent, sibling, or other family member	18	7	1	2	4	13%	10%
Yes, from a public resource, such as the library	0	0	0	0	0	0%	0%
Yes, self-taught via other external resources	48	23	9	5	9	36%	35%
No Prior Education	6	25	13	5	7	4%	38%

Based upon these results, it can be conjectured that the lack of digital literacy requirements (and therefore school-based educational offerings) in the NM K-12 space disproportionately affects rural students. The inequity rural students experience in receiving foundational technological education has far-reaching negative implications, including their preparedness for university-level technology requirements, something I will explore further in Chapter 6.

The second concept, as mentioned above, considers the correlation between formal (school based) technological education and student technological confidence levels. While autodidacticism can prove to be an effective means of learning certain information or skills, Wan Ng notes that in his 2012 study, students with self-taught technology skills lacked confidence in their knowledge of technology and had less ability to apply that knowledge in other technological modalities (e.g. students struggled to look up reference information in two platforms that looked different, but performed the same search function) than their peers who were taught computer skills in a school setting (2012). Ng's result was mirrored in the rural student population, something that became apparent when connecting the responses to this question to the responses to Question #9.

To recapitulate, Question #9 asked the students to rate their confidence in their ability to use the technology required in their FYW course. The rating scale was 1 to 5, 1 being not confident, 2 being slightly confident, 3 being somewhat confident, 4 being mostly confident, and 5 being completely confident. As can be seen in Figure 10, 90 (67%) of urban students rated their confidence at a 5, with an additional 37 (27%) rating their confidence at a 4, meaning 94% of urban students reported feeling mostly or completely confident in their technological abilities at the beginning of the semester. This left only 8 (6%) of urban students rating at a 3 or 2, with zero of these students rating their confidence at a 1. In stark contrast, only 22 (33%) of rural students rated their confidence at a 4 or 5, with the overwhelming majority (44/67%) rating their technological confidence at a 3 or lower.

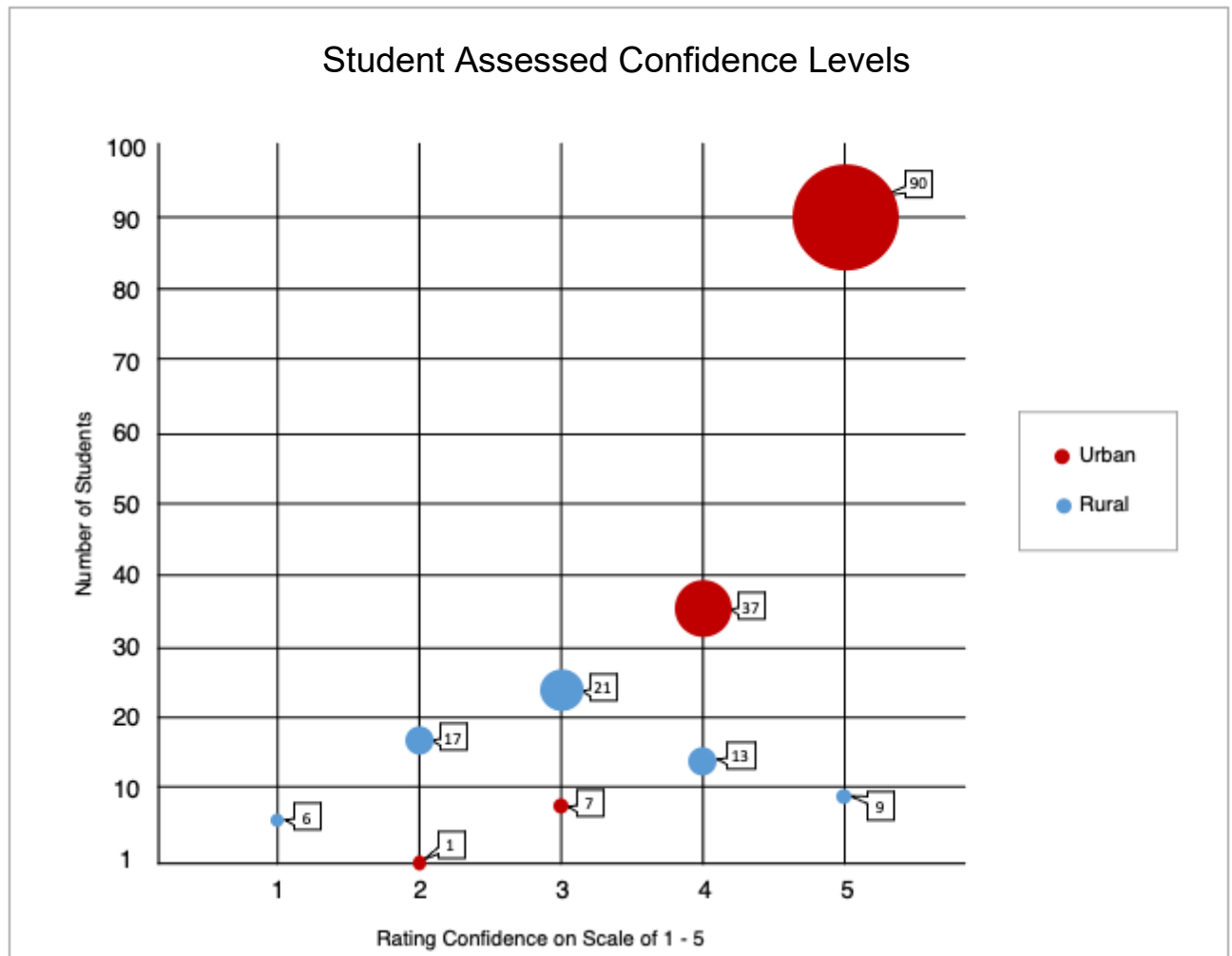


Figure 10: Representation of urban vs. rural student assessed confidence levels on a scale of 1 - 5.

Referring back to Table 1, there were 63 urban students who received formal technological education at school and 11 rural students. As mentioned above, these students' responses were linked with their responses to Question #9, rating their technological confidence on a scale of 1 to 5. This study found that 57 of the 63 urban students (90%) who received formal education on technology use rated their confidence at a 4 or 5, with the remaining 6 students (10%) rating their confidence at a 3. None of the urban students with school-based technology education rated their confidence levels at a 2 or a 1 and none of them left any follow up comments regarding the reasoning as to their rating.

Conversely, of the 11 rural students who received formal technological education, only one student rated themselves as feeling completely confident (5) in their technological ability, two students rated themselves as mostly confident (4), three students as somewhat confident (3), three as slightly confident (2), and two students as not confident (1). In addition to the spread of this rating, several of these students noted in the optional Question #10 comments box that despite having had some form of school-based education on how to use technology, that they still lacked confidence. For example, Student 29 (randomized identifying number) scored their technological confidence at a 2, then stated, "I did take a computer class in middle school for like three months and the rest is just self taut (sic) through using the computer and Google products so I don't know if anything I know is right or not." Student 132, who scored their technological confidence at a 1, noted a similar experience to Student 29, saying,

"I didn't have technology or internet access regularly until about 3 years ago because we could not afford it and I still can't afford to buy a laptop now so I'll be using library or computer pods for my assignments. I had some access and took a computer class at school but that was like 5th grade and alot (sic) has changed since then. I feel like I don't know nearly as much about how to use the internet or computers as the other people in my class and I'm nervous that I'll fall behind because I don't have enough knowledge to keep up."

There are many implications to the findings of these two questions and the connection between them but to summarize, the gap between urban and rural student technological education was significant in that urban students were found to have more access to varied technological education (school-based education, in particular) than their rural peers. This lack of consistent, accessible education for rural students resulted in their low technological confidence ratings, something that

was supported by several students' commentaries. This inequity in confidence between urban and rural students and how to address it will be discussed more in this chapter and in Chapter 6.

Survey Question #7

- *Were you aware upon entering the university that access to a computer and the internet would be required for your First-Year Writing (FYW) class? If so, please note in the comments box when you learned this information and from whom. If you do not recall where you learned this information, you may leave the comments box blank.*

The seventh survey question was posed so as to assess student awareness of technological requirements and to ascertain if these requirements were communicated clearly through the university, the Core Writing department, or other means. As depicted in Figure 11, the majority of both urban and rural students were aware that there is a technology requirement, with 91% of urban students and 88% of rural students expressing awareness. This means that there was an overall 90% awareness rate in the surveyed sample.

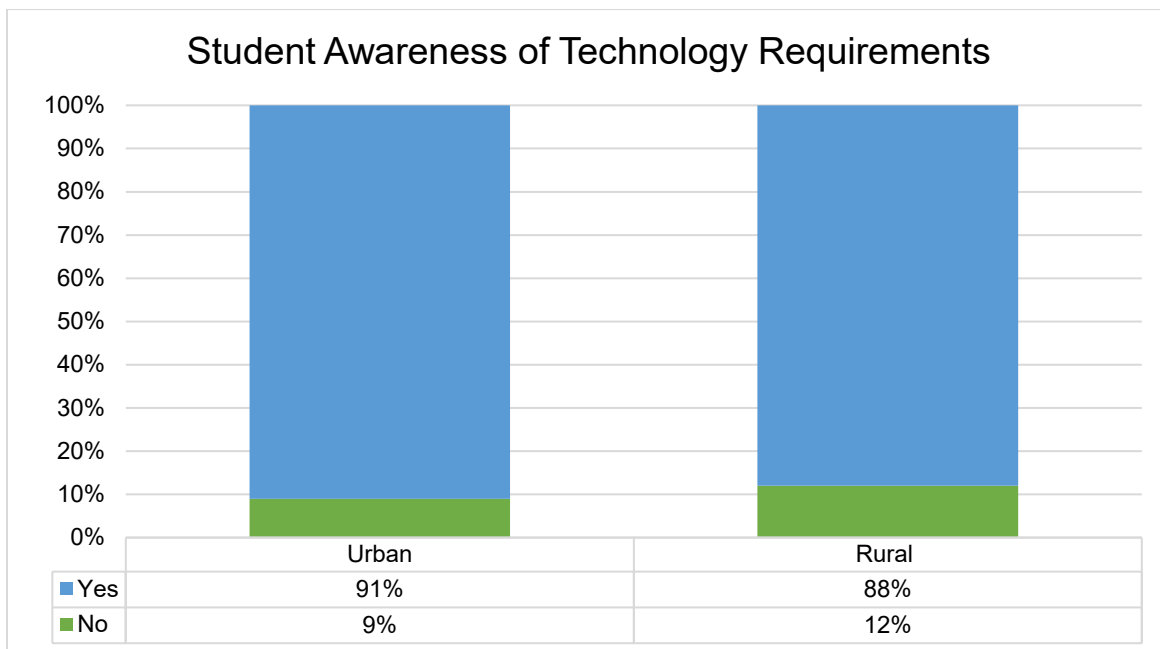


Figure 11: Responses gauging student awareness of UNM's First-Year Writing technological requirements.

While the equity of awareness between urban and rural students is encouraging, this question is still important to ask due to the language surrounding technology requirements at both the university and department levels, and how

those technology requirements are communicated to students. While several students noted that technology requirements were discussed in spaces such as new student orientation and the course syllabi, the vast majority of students who left comments on this question stated that they were never taught or told about technology requirements, and that they, rather, assumed there were requirements in place. Of the 181 students who responded that they were aware of technological requirements, 168 of them made additional comments, and 107 students stated that they were never taught or told about the requirements. For example, Student 17 wrote, “I know there’s technology requirements but no one really ever said what they are so I don’t really know what they are specifically.”

The element of knowing technology requirements exist but not knowing the specifics was echoed throughout the survey comments. This lack of clarity can likely be attributed to the language regarding technology requirements being vague and irresolute, something that is across the board at UNM, from the administration level to the department and course instructor level. As will be explored in Chapter 6, the need for clear, specific language surrounding technology requirements is crucial, as is consistent communication regarding these requirements, so as to alleviate student confusion and uncertainty.

Survey Question #8

- *Do you currently have **consistent** and **dependable** access to a laptop or personal computer? This excludes tablets and phones.*

The final question to be discussed in this chapter is Question #8, in which students were asked about their current access to laptops and computers. The purpose behind this question is two-fold: first, it seeks to discern how students access the devices needed to successfully participate in FYW courses, identifying if there is inequity in laptop/computer ownership between urban and rural students. Second, this question aims to ascertain if students are using devices that are not necessarily compatible with all of the digital tools and platforms needed for success in FYW courses, such as cell phones or tablets.

As can be observed in Table 2, reported student laptop/computer ownership is much higher in the urban student population than it is in the rural student population. With 95% of urban students reporting that they own laptops or computers, the 27% of rural laptop/computer owners is a stark contrast that speaks volumes, especially in conjunction with the 33% of rural students who reported having no consistent access at the beginning of the semester. Additionally, 40% of rural students reported that they use the computers in the UNM libraries or computer pods, all of which are listed as having limited hours (no 24-hour options) on the UNM Tech Finder website (2023). Interestingly, no students, urban or rural, reported using a rental option for laptop use, a statistic which seemingly indicates that either rental options are unknown to students, they are not viable due to cost or availability, or they do not exist.

Table 2: Current Student Technological Device Access

Response Selections	Urban Student Response	Rural Student Responses				Urban %	Rural %
		Aggregated Rural Total	Geographically Rural	Digitally Rural	Mixed Rurality		
Yes, I own a laptop or personal computer	128	18	7	3	8	95%	27%
Yes, I rent a laptop or personal computer	0	0	0	0	0	0%	0%
Yes or Sometimes; I use a school-owned laptop or personal computer in a library, computer pod, or other access area	5	26	10	7	9	4%	40%
No, I do not currently have consistent or dependable access, but I may buy or rent in the future	2	12	7	1	4	1%	18%
No, I do not currently have consistent or dependable access and I do not anticipate buying or renting in the near future	0	10	4	4	2	0%	15%

Several rural students commented on their current device access in the optional Question #10 comments box, giving insight as to the reasons they lacked access and the frustrations they had already encountered back in September of 2022. 31 rural students (47%) cited cost as a reason they did not own a laptop or computer, with 19 of those students noting that they are using an inconsistent or

incompatible device in order to complete their assignments. This is exemplified through the notations of Student 25, in which they wrote:

“I don,Äôt (sic) have a computer at home and can,Äôt (sic) afford to buy one so I use UNM,Äôs (sic) computers because all I have to use is my phone but I take care of my grandpa in the afternoons so I can,Äôt (sic) stay on campus to use the computers very much. However, sometimes our internet may go out which happened a lot two weeks ago and when that happens I can,Äôt (sic) even use my phone.”

Similar to Student 25, Student 130 expressed frustration with their lack of device access, as well as their desire for other options for completing course assignments, stating:

“Many of my classes use technology, and sometimes this can be difficult. I only have an iPad when I go home and I can’t do a lot of my work on it because the apps don’t work. I live up in the mountains so the internet goes out a lot. When the internet is down I am unable to get in touch with teachers or submit assignments. I would prefer using paper and pen over a computer to write my assignments.”

As a final example, Student 61 made comments regarding the device they had and how its incompatibility with the technology requirements affected them:

“I have a Kindle Fire tablet which makes it difficult to have access to some apps or tabs that are assigned to us because they aren’t available for my device. I can’t afford to buy a whole new laptop when I just got this tablet.”

As is evident from the statistics and student commentary above, rural students struggle to attain laptop or computer ownership for a variety of reasons, namely cost. This result will be re-affirmed with the second half of the results in Chapter 5, making it indisputable that lack of access to adequate devices puts rural students at a disadvantage in comparison to their urban peers as it necessitates that they must rely upon other computer options, all of which have restrictions for use, or

alternate devices that can make completing coursework more difficult. Possible solutions and alternate options to address this issue will be discussed in Chapter 6.

Survey Results Précis

The chief research question for this project asks, “Do the technological requirements and expectations in First-Year Writing (FYW) courses negatively impact rural student success in said courses?” The preceding quantitative analysis of Questions #1 through #9, with supporting qualitative commentary from the optional Question #10, exhibits clear, numerical evidence that responds to this question in the affirmative: the current technological requirements, both those that are communicated via UNM administration and those that are inherently expected by instructors, have a negative impact on rural students because they are at a demonstrable place of digital inequity in the FYW classroom. These inequities were illustrated through the thorough discussion of each question and the rationale as to why it was asked, a dissection of the collected data and its numerical articulation, which was then followed by annotations on the significance of the collected data and how it will be addressed in the implications section of Chapter 6.

The first evidentiary point that this results chapter addressed was to establish the significance of this student population. The results of Questions #1-#3 showed that the reported 33% rural student population in this student sampling is in similar alignment with the national rural population of 39%. This number indicates that a third or more of the UNM student body is from a geographically, digitally, or mixed rurality area. Because the technology requirements could potentially be placing a third of UNM students at a place of digital inequity, the need for discussion and solutions revolving around this topic is merited.

The second evidentiary point established in this chapter was that rural students were significantly less likely to have had consistent, dependable access to

technology and the internet, both prior to entering UNM and at the start of the semester, with many citing inaccessible geographic location, distance from urban areas, and cost as the primary reasons for lack of access. Data from Questions #4, #5, #7, and #8 revealed that 59% of rural students had inconsistent access to technology prior to enrolling at UNM, 80% had inconsistent access to the internet. Additionally, it was found that in spite of 88% of rural students reporting that they were aware of some of the FYW technological requirements, at present 73% of rural students still have either inconsistent or no access to the laptop or computer devices needed to be successful in FYW courses. As was discussed above, these students are forced to create workarounds, using incompatible devices to complete coursework, something which proves to be increasingly difficult, and is illustrated in the qualitative commentary from students in Chapter 5.

The final evidentiary point established in this chapter is how lack of technological access and inadequate digital education resulted in lower technological confidence levels in the rural student population. In Questions #6 and #9, it was found that only 17% of rural students had any sort of formal computer education prior to enrolling at UNM, with 38% of them reporting having had no prior technological education. The negative impact rural students experience from inadequate formative technological education is substantiated in their low self-reported technological confidence levels, in which 67% of rural students rated themselves as somewhat confident (3), slightly confident (2), or not confident (1).

Though this chapter demonstrates strong evidentiary support that the imbricated technology in FYW courses puts rural students at a disadvantage and

contributes to their continued digital inequity, it is only half of the story. The qualitative data analysis of Student Portfolio Reflection responses in the next chapter provides a rounding out of this data set. Using these students' own words, it is shown how they fared with the technology requirements over the course of the semester, delving into their triumphs, the obstacles they encountered, and suggestions they had for digital accommodations that would have made FYW experience more equitable.

Chapter 5: Student Portfolio Reflection Response Results

Reflection Response Results Overview

Following the quantitative expression of the survey responses in the previous chapter, this chapter assesses the student essay responses to Student Learning Outcome F: Reflection, as assigned in their FYW course final portfolio prompts. Though the data from Chapter 4 was more comparative between the experiences of urban and rural students, the data collected and analyzed in this chapter is centered on the rural student experience. Using the transformative emancipatory paradigm framework and narrative analysis, the following examination concatenates the rural student results from the survey to the corresponding rural student narrative responses, illustrating the impact that the technological requirements had on this student population over the duration of their FYW course. In the final section of this chapter, the results of both the quantitative and qualitative data sets are then summarized into defined corollary obstacles, thereby establishing the rationale for the implications discussed and conclusions made in Chapter 6.

Final Portfolio Expectations and SLO F Language Addition

The final portfolio, as assigned in FYW courses at UNM, is a website created by the students using a site building platform of their choosing (such as Wix, Canvas, Google Sites, or Weebly) that they use as an aggregated demonstration of their learning. This assignment is typically constructed over the course of the semester and is the only final project option, meaning there are no analog or paper-based alternatives to this required assignment. In this digital portfolio, students are asked to create a Home page with an introductory statement, Project pages which house their assignments for the course, and a Student Learning Outcomes (SLO) Reflections page where they write a reflective essay on how they feel they worked toward, or met, the SLOs for this course. Students then submit the link to their final portfolios within the UNM Canvas LMS system.

The SLOs, as listed below, are established in the syllabus for this course at the beginning of the term and are discussed in depth over the duration of the semester:

Rhetorical Situation and Genre

- A. analyze, compose, and reflect on arguments in a variety of genres, considering the strategies, claims, evidence, and various mediums and technologies that are appropriate to the rhetorical situation

Writing as a Social Act

- B. describe the social nature of composing, particularly the role of discourse communities at the local, national, and international level

Writing as a Process

- C. use multiple approaches for planning, researching, prewriting, composing, assessing, revising, editing, proofreading, collaborating, and incorporating feedback in order to make your compositions stronger in various mediums and using multiple technologies

Grammar and Usage

- D. improve your fluency in the dialect of Standardized Written American English at the level of the sentence, paragraph, and document
- E. analyze and describe the value of incorporating various languages, dialects, and registers in your own and others' texts

Reflection

- F. evaluate your development as a writer over the course of the semester and describe how composing in multiple genres and mediums using various technologies can be applied in other contexts to advance your goals

Research

- G. use writing and research as a means of discovery to examine your personal beliefs in the context of multiple perspectives and to explore focused research questions through various mediums and technologies
- H. integrate others' positions and perspectives into your writing ethically, appropriately, and effectively in various mediums and technologies

Student responses to *SLO F: Reflection* were selected for assessment

because this while this SLO calls upon the students to contemplate their development as writers and touches on their technology use, the language was also open-ended enough that it presented an opportunity for addition. Understandably, the language of this SLO as it exists does not explicitly ask students about their experience with the technology during the course, rather focusing upon the experience of learning compositional content on various digital platforms and technological devices. The aim of this study, however, was to determine if the expected technological access and knowledge presented an obstacle for rural students.

With this aim in mind and with the permission and assistance of the UNM Core Writing Coordinator, additional language was added to SLO F for the Fall 2022 semester. The intention of the added language was to give all students, but rural students in particular, a space where they were able to reflect upon both the

technological triumphs and struggles they experienced in their FYW course. It was phrased as follows:

Evaluate your development as a writer over the course of the semester and describe how composing in multiple genres and mediums using various technologies can be applied in other contexts to advance your goals.

Additionally, please describe how you felt about using these technologies. Do you feel as though your prior experience with technology adequately prepared you for the technological expectations in this course? Did they make completing the course requirements easier? More difficult? Why or why not?

This language addition was articulated in a way that connects students' prior and current experience, education, and access to technology with the technological expectations they encountered within their FYW courses. The resulting narrative responses from rural students, when reviewed in conjunction with their responses to the Technology & Rurality survey, uncovered a correlation between inadequate technological access/digital literacy and the technological difficulties/digital deficiencies they experienced, something which will be exemplified later in this chapter.

Prefatory Data Analysis

The analysis of the rural student responses began by creating data sets which was done by matching their responses from the technology and rurality survey with their responses to SLO F. In doing so, the first observation that was made was that of the 66 students who self-identified as geographically, digitally, or mixed rurality, only 42 of them turned in a final portfolio link. Because the final portfolio is required to pass all FYW courses, that means at least 36% of the rural student participants in this study did not finish the course. Additionally, if there were students who did not pass based upon criteria other than failure to submit the final portfolio, it would mean this incompleteness rate is even higher than 36%. Because final student grades were not collected for this study, the number of students who did not pass the course outside of those who did not submit the final portfolio cannot be officially determined.

Though this high incompleteness rate cannot be definitively attributed to lack of technological access or digital literacy on the part of rural students, it is something that is indicated based upon these students' responses to the technology & rurality survey. Of the 24 rural students who did not turn in their final portfolios, 18 of them responded on the survey that they did not have consistent or dependable technology or internet access at the time that they started the course, with the remaining 6 indicating that their access was via the library, computer pods, or another public access area. Furthermore, 16 of the 24 aforementioned students reported having no prior technological education, with the remaining 8 students reporting their prior education as being self-taught. The picture this data correlation paints is that many of the rural students who did not complete their FYW courses are also students who

did not have consistent, dependable access to the required technology and are those who do not have any formal education or training in computer or internet usage.

In comparison to the rural students, 124 of the 135 urban students turned in their final portfolio link, making their incompleteness rate around 8%, though it could be higher based upon the reasoning as stated above. This suggests that based upon this sampling, rural students are six times less likely to complete a FYW course than their urban counterparts. While the significant disparity in completion rates between urban and rural students cannot be singularly linked to technological inequity, it is something that should be considered—if over a third of a particular student population is failing to pass a course, and the majority of that population reports not having adequate education in or access to the required technology, the indication is that the technology may be creating a barrier to their success.

In addition to the rate of rural students who did not complete their FYW course, the response narratives from the students who did complete the final portfolio give a rounded, scrutable account of how the technological requirements impacted their success in the course. Because there were 42 narrative responses collected and reviewed for this study, it was apropos to select a smaller sample of these responses that were widely representative of the student population, on which to conduct an in-depth narrative analysis. So as to ensure that the selected responses were inclusive of the many factors experienced by rural students (as expressed in the survey), two responses from each identified rurality sub-category

(geographically, digitally, and mixed) were selected, with effort to select those that had responses to the other survey questions.

The next section of this chapter analyzes the paired data sets of each selected rural student, including each student's survey response data (which is summarized in individual tables, per student) and their response to SLO F, with several data sets including relevant, supporting visual examples, such as images from their final portfolio sites.

Reflection Response Data Analysis

Core Writing Technology & Rurality Survey Questions

Because the student responses to the Core Writing Technology & Rurality Survey are summarized in tables in the following data sets, it is pertinent to review the survey questions prior to beginning the analysis section of this chapter. The survey questions are as follows:

1. Would you consider yourself as coming from a **geographically rural** community? This is defined as a community with fewer than 2,500 people in a widespread or small localized area.
2. Would you consider yourself as coming from a **digitally rural** community? This is defined as a community that is without or has limited access to broadband internet, but is not an urban community (meaning, the population is fewer than 50,000).
3. If you identified yourself as being from or living in a digitally or geographically rural community, please identify if the area you are from is digitally rural, geographically rural, or both. If you are not from a digitally or geographically rural community, mark N/A.
4. Before attending UNM, did you have **consistent** (daily or as needed) access to technology? Technology refers to computers or other similar devices (cell phones, smart phones, tablets, etc.).
5. Before attending UNM, did you have **consistent** (daily or as needed), **dependable** access to the internet? Dependable refers to internet that had no or very few outages and maintained adequate speeds with minimal lag.
6. Before attending UNM, did you receive training or education on how to use computers or the internet?
7. Were you aware upon entering the university that access to a computer and the internet would be required for your First-Year Writing (FYW) class? If so, please note in the comments box when you learned this information and from whom. If you do not recall where you learned this information, you may leave the comments box blank.
8. Do you currently have **consistent** and **dependable** access to a laptop or personal computer? This excludes tablets and phones.
9. On a scale of 1 to 5, how confident are you in your ability to use the technology required for this FYW course? This includes your ability to use both the digital tools (ex. the internet, UNM Canvas, etc.) and the technological devices (computer, laptop, etc.) as cited in the course syllabus or as directed by your instructor.
10. Please note any additional comments you may have below, including explanations or clarifications you feel are relevant.

Student 61 Response Analysis

Table 3: Student 61 Survey Responses

Student Identifying Number	Survey Responses								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
61	Yes	No	GR	Yes	Yes	Self-taught	Yes	Yes or Sometimes; use library or computer pod computers	3
	Q10: Additional Comments								
	"I have a Kindle Fire tablet which makes it difficult to have access to some apps or tabs that are assigned to us because they aren't available for my device. I can't afford to buy a whole new laptop when I just got this tablet."								

At the beginning of the term, Student 61 self-identified as geographically rural, reported having self-taught technological education, and rated their technological confidence level at a 3. They also noted that while they did have access to computers through the UNM libraries or computer pods, that the device they had for completing assignments and work outside of class (a Kindle Fire) was difficult to use because it was not compatible with several course-required apps and functions. Student 61 then cited cost as a barrier, stating that because they had recently purchased the Kindle Fire tablet, that they could not afford to purchase an alternative or additional laptop on which to complete their coursework.

The website that Student 61 submitted at the end of term to meet the final portfolio parameters of this course was very simplistic. As is exemplified in Figures 12 and 13, all sections of the site were monochromatic, with minimal font and layout variance, and the only multimodal media elements were either stock images standard to the website template, or images of the course assignments that had been typed, printed, photographed, and uploaded by the student.

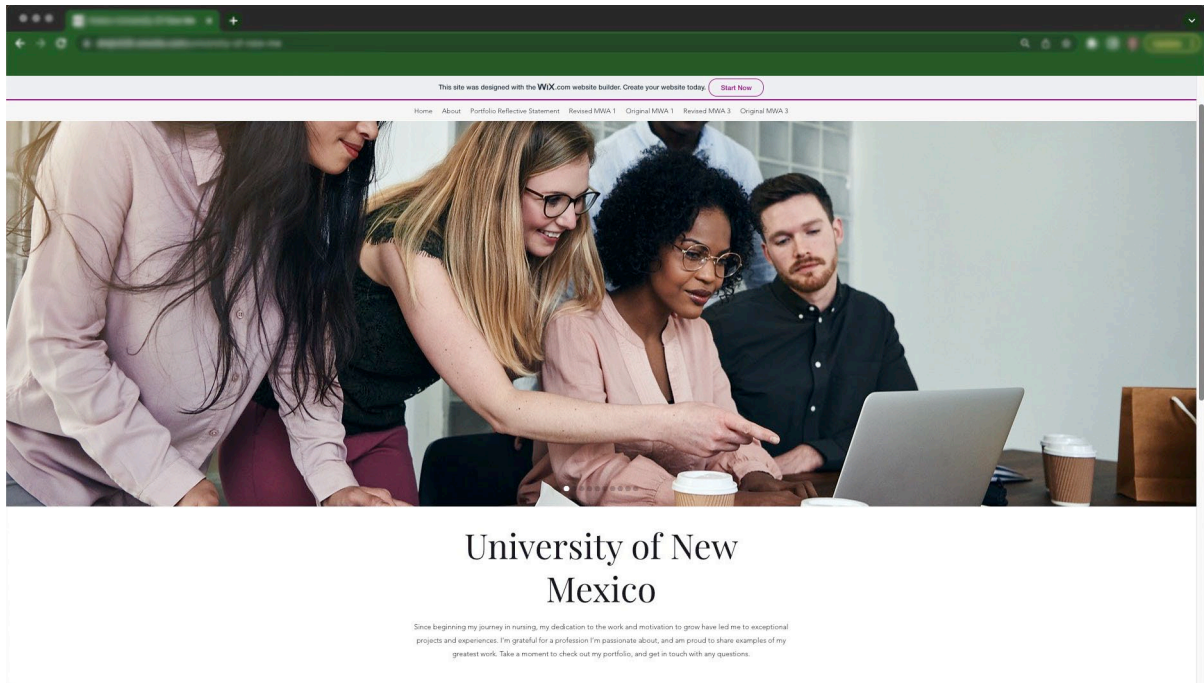


Figure 12: Final portfolio website homepage submitted by Student 61, with identifying information blurred to protect student anonymity.

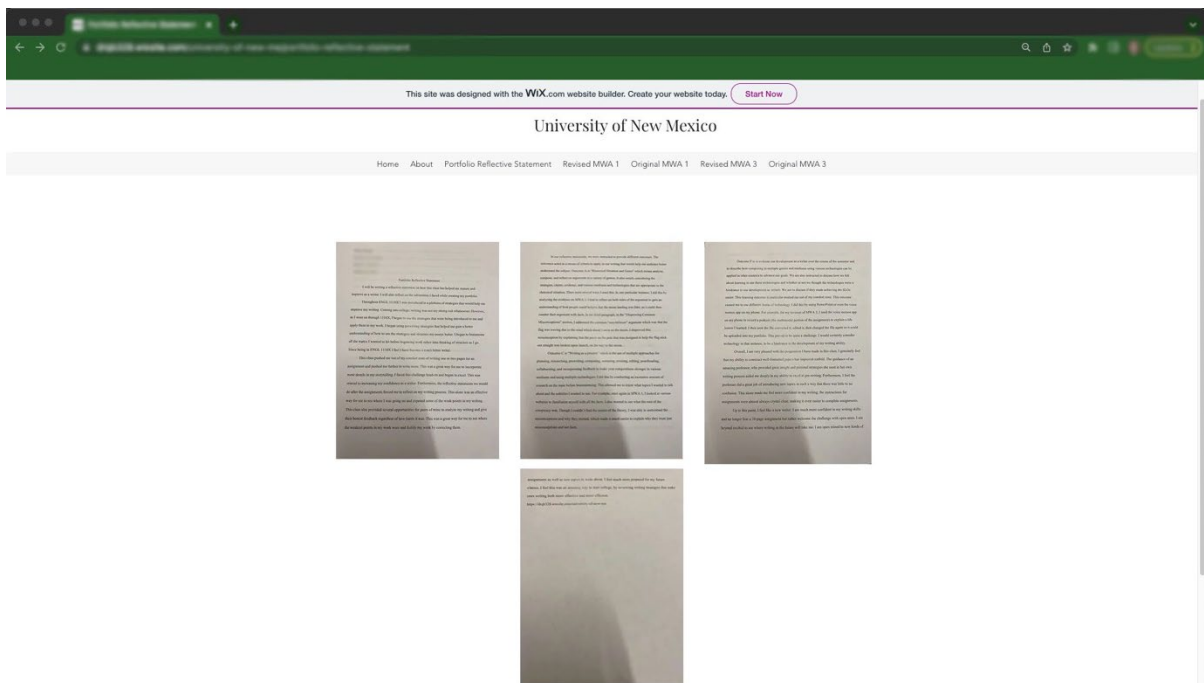


Figure 13: Portfolio Reflective Statement tab on the final portfolio website submitted by Student 61, with identifying information blurred to protect student anonymity.

While design and creativity are not primary foci of this analysis, the generic nature of this student's final assignment should be noted as it appears to indicate difficulty with the technology, something they discussed within their reflective essay.

In their reflection on SLO F, Student 61 wrote:

"Using different types of technology to write this semester was difficult and I would say it was a hinderance to learning. I was never taught how to use things like Word so the fact that they were required definitely made it harder for me. I also had to use my Kindle Fire to do my assignments and it wasn't compatible with most things we worked on. If I had known that my Kindle wasn't compatible, I would have waited until I could afford to buy something else but hindsite (sic) is 20/20.

An example of how the technology impacted me is this portfolio site. Making this website has been so hard to do on my tablet because the Wix app isn't available for Kindle but when you pull the Wix site up on Google Chrome, everything is really small and it doesn't work right. For example, I couldn't upload files from my tablet so I had to take pictures of my essays and upload them. Even now I can see that there's problems on all of my website pages but it's too late to keep trying to fix it now. So I would say that technology was a big problem for me this semester because I couldn't really use it very well and used so much time trying to make everything work right that I didn't focus much on what I was writing in my actual papers."

Student 61 cites several dilemmas with the technological expectations in this course, particularly that of their device's incompatibility with course required technological tools and the amount of effort they had to expend in learning to use the expected technology. They expressed regret about purchasing their Kindle device, noting that they were unaware of its incompatibility with the apps and tools required for the course. Student 61 then detailed the workaround that they had to implement (photographing their assignments and then uploading them to the site) when the incompatible functionality of their device did not allow for necessary file uploads to their final portfolio website. The student closes their reflection response with a tone of frustration and defeat, professing that they felt unable to give adequate attention

to the writing content of the course due to the excessive effort needed to manage the technological challenges.

This narrative speaks to two suppositions: one, that the course device compatibility requirements are neither well defined nor clearly communicated to the students, and two, that for rural students who struggle with technological and digital literacy, much of the effort that should be used to learn the course content is diverted toward navigating the technological requirements for the course. While this student was able to find creative solutions to their technology obstacles that demonstrated resilience and robust problem-solving abilities, the fact that these issues existed in the first place suggests that inequitable technological accessibility causes a barrier to rural students' plenary course participation anyway. Furthermore, the fact that this student had to sacrifice their understanding of the course content in favor of managing the technological hurdles they encountered speaks to the notion that for rural students who experience digital inequity and technological literacy gaps, the required digital coursework expectation forces a shift in focus away from writing and toward technology. The implications of these suppositions will be discussed further in Chapter 6.

Student 132 Response Analysis

Table 4: Student 132 Survey Responses

Student Identifying Number	Survey Responses								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
132	Yes	No	GR	No	No	Yes, at school	Yes	Yes or Sometimes; use library or computer pod computers	1
	Q10: Additional Comments								
	<p>"I didn't have technology or internet access regularly until about 3 years ago because we could not afford it and I still can't afford to buy a laptop now so I'll be using library or computer pods for my assignments. I had some access and took a computer class at school but that was like 5th grade and alot (sic) has changed since then. I feel like I don't know nearly as much about how to use the internet or computers as the other people in my class and I'm nervous that I'll fall behind because I don't have enough knowledge to keep up."</p>								

Student 132 identified as geographically rural in the survey, reported having inconsistent access to technology and the internet prior to enrolling in college, and stated that cost was the barrier to their previous lack of access, as well as the barrier to computer ownership at the beginning of the term. They also noted that because they were unable to purchase a laptop, they planned to access school-based computers for this course. Despite this student indicating that they were taught how to use computers and the internet at in a formal school setting, they expressed concern regarding their technological and digital literacy due to that education taking place nearly a decade prior, in elementary school. This concern was such that they rated their technological confidence at a 1.

In their reflection response, Student 132 discussed their growth in technological knowledge over the course of the semester, conveying pride in their accomplishments and appreciation for the new skills they learned in the course. In conjunction with this new-found technological confidence, however, they also

described a difficult experience with the FYW technological expectations, similar to the reflective introspections of Student 61. Student 132 wrote:

“Through this semester, I feel I have grown the most in multimedia use but it wasn’t easy. In this class I learned how to use Zoom to conduct interviews and record them, how to transfer media into projects using Google drive software, and how to build my own site. While I’m proud of what I learned, I definitely struggled because unless we were able to work in the computer lab in class where I could ask questions, I had to figure it out on my own. Thankfully my professor was very responsive to e-mails and helped me whenever I asked questions.

I would say all of the technology expectations made achieving the SLOs harder for me because I didn’t have much baseline experience in computers or using the internet. I had to work hard to learn how to use them while I was learning how to write in a way that was unfamiliar. I do think that learning to use these types of technology will probably be useful for my future English classes because now I have some of the important technology skills that they require, but it would have been so much easier if I had known how to use things like Word or One Drive before starting this class.”

Akin to the supposition above, this narrative echoes and provides evidence for one of the base assertions in this study: a lack of foundational technological literacy in rural students places them at a disadvantage because they are obliged to both the technological and content requirements in FYW courses. While Student 132 may have garnered some essential technology skills in this course that will serve them in future writing courses, I assert in Chapter 6 that these skills *should not* be introduced for the first time in FYW courses, and the fact that this is a reality for many FYW students should be addressed.

Student 25 Response Analysis

Table 5: Student 25 Survey Responses

Student Identifying Number	Survey Responses								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
25	No	Yes	DR	No	No	No prior education	Yes	No current consistent or dependable access, but may purchase in the future.	2
	Q10: Additional Comments								
	<p>"I don,Äôt (sic) have a computer at home and can,Äôt (sic) afford to buy one so I use UNM,Äôs (sic) computers because all I have to use is my phone but I take care of my grandpa in the afternoons so I can,Äôt (sic) stay on campus to use the computers very much. However, sometimes our internet may go out which happened a lot two weeks ago and when that happens I can,Äôt (sic) even use my phone."</p>								

Student 25 identified as being digitally rural and reported as having inconsistent access to technology and the internet, both prior to enrolling at UNM and at the time of this survey. Similar to Student 132, Student 25 also cited cost as a barrier to technological access and ownership but in this case, due to familial obligations, Student 25 was unable to stay on campus long enough to consistently use the library or computer pod computers. This left Student 25 to use their cell phone as their primary device for completing FYW coursework, something that did not function correctly, as can be evidenced by the randomly inserted characters (e.g. can,Äôt) in several areas of their survey comments under Question 10.

As can be seen in Figures 14 and 15, the final portfolio site submitted by Student 25 was similarly simplistic to that submitted by Student 61—monochromatic, with minimal variations to layout or font. Student 25, however, was able to upload their assignment files to their project tabs on the site, with each tab housing a single

Word document. The only other multimodal element in this portfolio was the photo on the homepage, which was not centered in the frame, thereby cropping out the top of the student's head, something they note was unintentional in their reflective essay. As was noted in the assessment of Student 61, the quality of this student's website is not the primary means of assessment, but it does speak to the difficulty they had in using their cell phone to format the page.

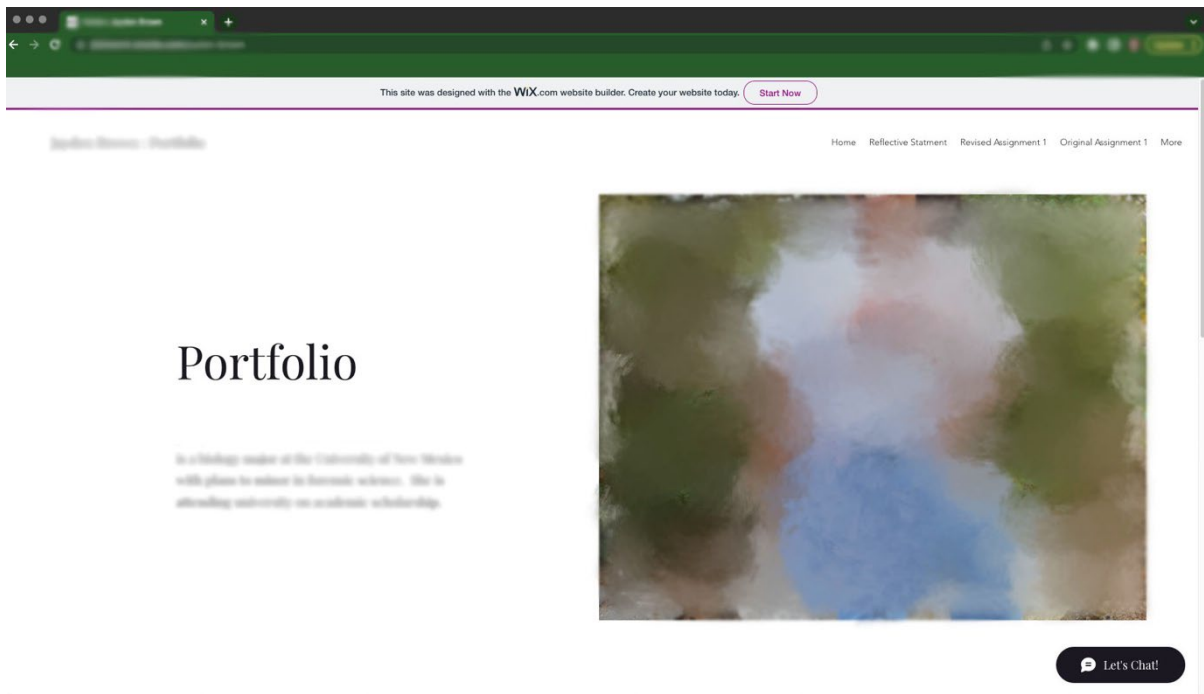


Figure 14: Final portfolio website homepage submitted by Student 25, with photo and other identifying information blurred to protect student anonymity.

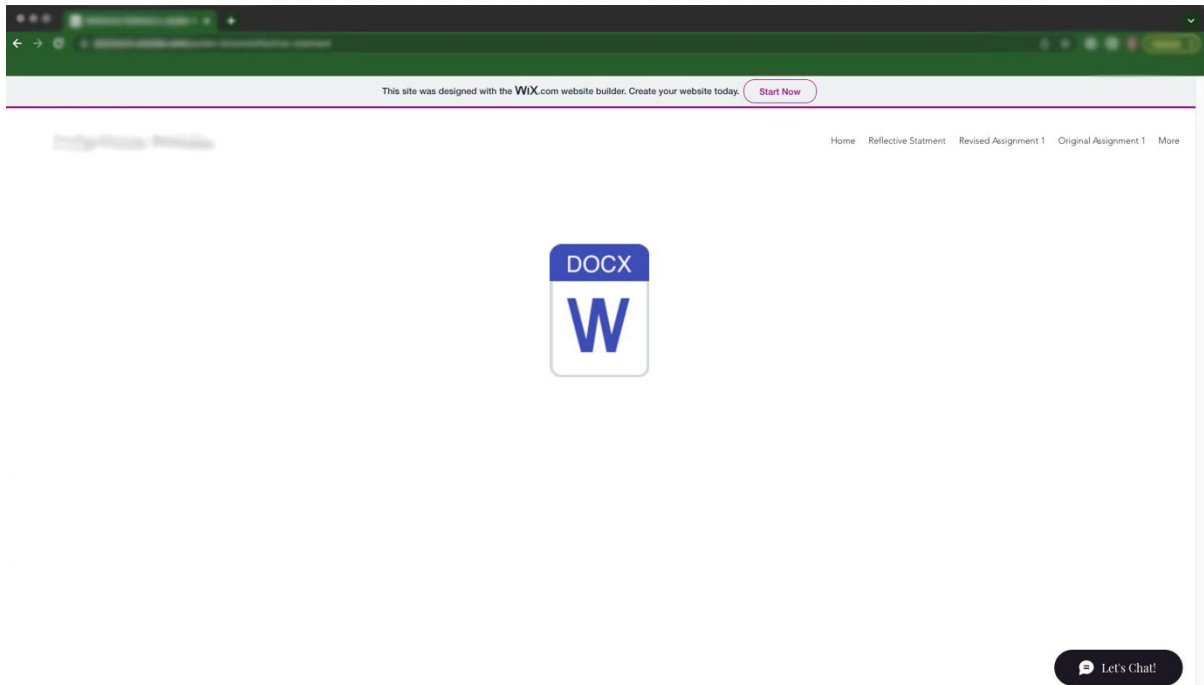


Figure 15: Reflective Statement tab on final portfolio site submitted by Student 25, with identifying information blurred to protect student anonymity.

The starkness of this portfolio, again, suggests that this student encountered some difficulty in using the required technology and digital tools to their fullest capabilities. This suggestion was confirmed by the student in their reflective response, in which they discussed the technological obstacles they encountered in having to complete their FYW course assignments on their cell phone. Student 25 wrote:

“Outcome F means that I need to reflect on my work this semester and how technology made it harder or easier to do the work. Honestly this class was really hard this semester because even though I could use the computers at school I wasn’t able to spend much time on campus so I had to do most of my work at home on my phone. I didn’t do very good on my MWA #1 and #2 because the way Word worked was weird compared to Google docs that I used in high school. I made a lot of mistakes that I didn’t see before turning them in because I couldn’t figure out how to do spellcheck on the Word app. However, my MWA #3 revision was better but that’s because I made sure (sic) to finish it at school so I could fix any mistakes before I turned it in. I also had a hard time making this website because I couldn’t figure out how to use a lot of the tools on the Wix app. Whenever I tried to change stuff it never saved and I couldn’t fix some things like my picture so I had to leave it like that even

though my head is cut off. Overall I would say I don't think I grew much as a writer because I couldn't really write how I was supposed to because I was doing it all on my phone. I hope I can figure out renting a laptop or something for my next class so I can actually try to improve my writing."

As is evidenced by the narrative submitted by Student 25, the technological expectations in their FYW course, coupled with an inadequate and incompatible device, completely derailed this student's learning experience. Because they struggled so immensely to access a computer and had to rely primarily on their phone to complete assignments, this student was unable to ascertain if they had any growth or improvement in their writing abilities at the end of the course. This is something that, as seen in these first three narratives, appears to be a trend among rural students—inequitable technology access, often based in socioeconomic factors such as cost, linked with inadequate foundational technological education and digital literacy, results in an excessively arduous and frustrating FYW learning experience.

Additionally, it is worth noting that Student 25 indicated that they relied upon several apps, such as Word and Wix, to complete their coursework. These applications are touted as being equally functional, mobile-device compatible versions of the standard desktop or browser versions of these programs. If this is the case, however, it should be asked, why are so many students unable to produce content of equal quality from these apps that they could otherwise produce on a desktop or laptop computer? This question, and the resulting implications, will also be addressed in Chapter 6.

Student 159 Response Analysis

Table 6: Student 159 Survey Responses

Student Identifying Number	Survey Responses								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
159	No	Yes	DR	No	No	No prior education	Yes	Owens laptop or computer	3
	Q10: Additional Comments								
	"Growing up I didn't have access to technology but now that I'm older I do."								

Student 159 identified as having come from a digitally rural area, with inconsistent access to both technology and internet, and no prior technological education. They did, however, state that they had consistent access to technology and reported owning their own laptop at the time that this survey was disseminated. This student rated their technological confidence at a 3, which sits near the rural student confidence rating average of 3.3, but is still far below the average 4.5 confidence rating of their urban counterparts.

This student's reflection response looked at the technological expectations of the course more positively than some of the other selected student narratives, expressing an understanding as to the how composing in a variety of technologies can be beneficial in the future. They also discussed the trials and triumphs they experienced in learning to use the various technologies presented in their FYW course, writing the following:

“I felt like my writing has developed positively over the course of the semester. I feel like writing in different genres expanded my mindset and will allow writing to be easier in the future. Using technology is the future and incorporating that into our projects was helpful to our futures. It was hard for me though because I am not the best with technology anyways. I felt like learning how to create a website was difficult to the extent of I didn’t know how. I had to learn how to research my questions on the internet so that it would bring up the right answer. I appreciate how accessible the internet is now for all my questions.

I felt like achiever (sic) the SLOs were easier because of it because technology added another aspect to talk about. I do not feel like I was prepared to use technology as well as other students because I had not really used it before. I was more confident on how to use computers but then after a week I realized I don’t know very much. Over the course I began to feel more comfortable with-it (sic) and was able to make something I’m proud of. I had no prior training in using these websites and I think that is a factor when it came to creating this portfolio. I feel like I learned the basics of using technology and making my pieces look pretty. I still need to work on the basics of grammar because my sentence structure is still iffy and I am just most concerned on how to fix my mistakes.”

Student 159, while maintaining an overall positive view of their FYW technology experience, still demonstrated how the technological expectations of the course were beyond what they initially thought would be within their capabilities. They noted that they were “...not the best with technology anyways” and that they had been “...more confident on how to use computers but then after a week I realized I don’t know very much.” This lack of confidence was then ameliorated by the growth seen in their technological abilities, something they identified by saying that they felt more comfortable by the end of the course and were able to create something of which they were proud.

The closing of this narrative, however, is where we see the same theme reappear as in prior narratives: focus shifting toward the mastery of the technology ahead of the mastery of the course content. Student 159 stated that they felt as

though they “...learned the basics of using technology” but then went on to write that they “...still need to work on the basics of grammar” because they felt as though their sentence structure was still in need of improvement, and that they were “most concerned” about learning how to identify and remediate grammatical errors.

In looking at the language used in this narrative, it can be inferred that this student spent the majority of their effort on learning “the basics” of the required technology. It should be conveyed that learning to use the technology needed in FYW is not a suboptimal use of time; it’s rather the opposite in that it’s an absolute necessity. As I will argue in Chapter 6, however, its importance should not supersede the core content in FYW courses, something that appears to have become a struggle for many rural students as they grappled with bringing their inadequate technological literacy up to speed while simultaneously learning to write in a collegiate setting.

Student 29 Response Analysis

Table 7: Student 29 Survey Responses

Student Identifying Number	Survey Responses								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
29	Yes	Yes	Both	Yes	No	Self-taught	No	No current consistent or dependable access, no future plan to purchase.	2
	Q10: Additional Comments								
	“I did take a computer class in middle school for like three months and the rest is just self taut (sic) through using the computer and Google products so I don’t know if anything I know is right or not.”								

Student 29 identified as being both digitally and geographically rural, and though they reported as having had consistent access to technology prior to enrolling at UNM, they also reported having inconsistent access to the internet and no current consistent or dependable access to technology. They also noted that the majority of their technological knowledge (which seemed to center on Google products) was self-taught. This student then rated their technological confidence at a 2, stating that even though they took a three-month computer course in middle school, they still felt insecure in the accuracy of their technological knowledge because the majority of what they knew or understood was learned through trial and error.

Despite the concern Student 29 expressed regarding their technological abilities, the final portfolio site they submitted, as seen in Figure 16, was cohesive and demonstrated an ability to integrate multimodal components with a finesse that was neither seen in the other selected student portfolio sites, nor in the majority of the other 36 rural student portfolios.

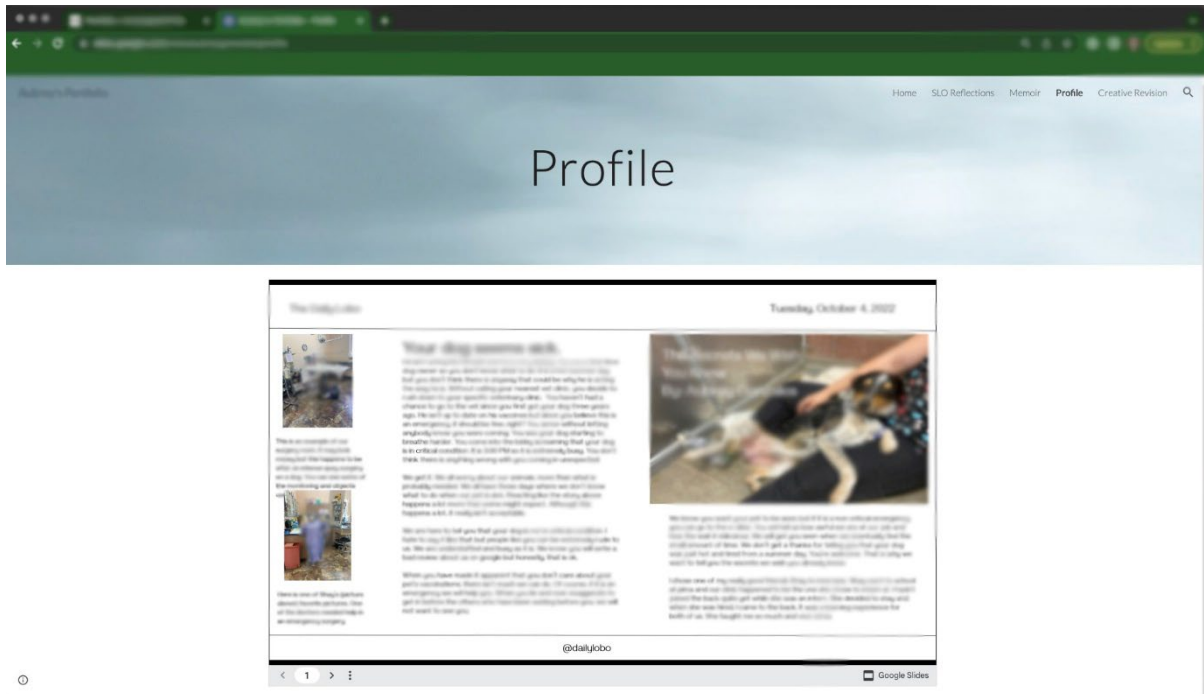


Figure 16: Profile tab on final portfolio site submitted by Student 29, with all identifying information and photos blurred to protect student anonymity.

Because this student created their portfolio using Google Sites and several of their integrated projects were created using other Google products (such as Google Slides), it stands to reason that their aforementioned self-taught digital literacy in using these tools translated to knowledge that was usable in their FYW course. This reasoning was something to which they attested in their SLO reflection response.

The reflection response from Student 29, while rather succinct, served to provide their perspective on how they were able to use their existing technology abilities in their FYW course, as well as describing the challenges of learning technological skills outside of their established wheelhouse. They wrote:

“Finally, the last SLO in the final portfolio is Outcome F, which is “Reflection”. This means that you personally evaluate your growth and success as a writer and how the different and numerous technologies helped or made it harder to formulate the many genres and mediums over the course of the semester. An example of Outcome F is the technologies; in MWA 1, the genre was a conspiracy theory that had to be written into an essay. In high school, I became used to Google products because of the covid-19 pandemic.

However, when I began school at UNM in the fall, I had to learn a whole new system of technology through Microsoft. The last time I had used Microsoft was when I was in elementary school, so learning how to use Word again to write my MWA and then convert it to a PDF was stressful (also considering the fact that Microsoft Word had been updated and changed tremendously since I was eleven years old). Luckily I could still use some of the Google products I was used to in highschool (sic); I made this website and my profile assignment using Google products. Having to switch to Microsoft for MWA 1 was a difficult transition and I still feel like I can write with more success in Google but it probably would have been easier to learn to use Microsoft Word if I had a computer at home instead of a tablet or my phone.”

Though this narrative does detail some of the technological successes

Student 29 achieved in their FYW course, it also speaks to the frustration experienced by this student when they had to replace known skills (using Google products) with new knowledge (Microsoft Word), especially since the new knowledge had comparable function to the known skill. This again calls into question the concept of assumed knowledge, but from a different perspective that asks why Word is the gold standard word processing tool when it is indicated that post-pandemic high school graduates demonstrate more foundational knowledge and digital literacy in other composition tools, such as Google Docs. The shift in digital literacy and foundational knowledge from Word to Google, as implied by Student 29’s narrative, is something that could possibly be leveraged as a tool to help equitize rural students in FYW classrooms, a postulation that will be further explored in the next chapter.

Student 130 Response Analysis

Table 8: Student 130 Survey Responses

Student Identifying Number	Survey Responses								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
130	Yes	Yes	Both	No	No	No prior education	Yes	No current consistent or dependable access, no future plan to purchase.	2
	Q10: Additional Comments								
	<p>“Many of my classes use technology, and sometimes this can be difficult. I only have an iPad when I go home and I can’t do a lot of my work on it because the apps don’t work. I live up in the mountains so the internet goes out a lot. When the internet is down I am unable to get in touch with teachers or submit assignments. I would prefer using paper and pen over a computer to write my assignments.”</p>								

Student 130 identified as both digitally and geographically rural, noting in their Question #10 comment response that they “live in the mountains,” in an area where technology and internet access is inconsistent and undependable. They also stated that at the time of this survey, they did not have consistent or dependable computer access and would be completing the course using a tablet. Additionally, this student reported that they had no prior education in computer or internet use, rating their confidence in being able to manage the required FYW technologies at a 2.

This student’s narrative response aligns with the concerns they expressed in their initial survey. In addition to experiencing travails with accessing and using the necessary FYW digital tools off-campus, they also discussed their difficulty with navigating the digital tools themselves. Specifically, they emphasized the imbalance of time and effort expended in completing the writing portion of assignments in comparison with the effort needed to create the multimodal components of the assignments, writing:

“Each project had very different ways to set them up technology wise. I have never been very good with technology so it was a bit hard for me to get the hang of it for these projects. Learning to use the different technologies needed was hard for me. I was able to write out all of my projects in Google docs on my iPad. Putting my writing into technology like Word and Wix to make it better took me more time to fix it up rather than write it. It was especially hard to do because I could only use these technologies at school. I couldn’t get Word to work on my iPad and my internet was too bad to use Wix at home. These technologies were both a help and a hinder. They set me back as far as time goes but they ended up making really beautiful projects in the end. I didn’t feel as though they had all that much to do with the SLOs. I don’t feel as though I have been adequately prepared for the amount of technology I probably needed or might need in the future. I felt this way because I really didn’t know much about what I was doing. It took a very long time for me to finally figure out exactly what I needed to do. I still don’t feel very confident with the technology we used this semester. This is because I’m still lacking some strategies I need.”

The narrative written by Student 130 recalls similar assertions made in the narratives from Students 61 and 159. All of these students reported having so much difficulty with accessing and learning to use the technology and digital tools required in their FYW courses, that they ended up spending more time and effort navigating the technology than they did on their actual writing. This left Student 130 feeling as though they were still missing some critical technological skills, even at the end of their FYW course. They also noted that they were unable to make the connection between the reasoning behind learning to write using various technologies and the SLOs. This statement is, arguably, one of the most concerning evidentiary exhibits in this study because it indicates this student, and other rural students, are so burdened by the technological expectations in FYW courses, that they are unable to make the critical content connections needed to achieve the SLOs and establish understanding of foundational FYW practices. Without this foundational understanding, the implication is that rural students may be exiting their FYW

courses unprepared for subsequent writing courses, something that will be discussed and addressed in Chapter 6.

SLO F Response Results Précis

The results exhibited by the above analysis provide a representative view of the rural student experience in FYW courses and corroborates the assertion that, for rural students, technological inequity negatively impacts their performance, and thereby their success, in FYW courses. It has been established that rural students are more likely to possess gaps in technological and digital literacy due to the compounding factors of deficient foundational computer and internet education, and inadequate access to personal computers and the internet. The SLO F reflective statements from rural students, coupled with their responses to the Core Writing Technology & Rurality Survey, demonstrate that these educational and accessibility inequities result in digital incertitude and low technological confidence for this student population, something that negatively impacts their ability to fully participate and engage with all elements that comprise FYW courses.

With these results in mind, it has been determined that the following challenges, and their subsequent consequences, are directly correlated with the discordancy between FYW technology practices and the digital inequity experienced by rural students:

- Technology requirements and expectations are inconsistently defined and poorly communicated
 - Students unwittingly purchase incompatible devices and have no recourse for alternative technology use
- Requiring the use of technology and digital tools that are not universally compatible and/or accessible
 - Students who are unable to consistently access compatible devices or the internet are unable to meet course requirements
- Requiring students to use specific digital tools (such as Word) without offering or allowing comparable alternatives

- Students spend more time and effort on learning to navigate the required FYW technology than they do on learning and practicing core writing approaches
- Students may exit the course with substandard writing skills, failure to grasp the SLOs, and fragmentary technological capabilities

While these challenges are not singular to FYW technology practices, because FYW courses are taken by nearly every student who attends a university, it is crucial that those who are involved in the instruction and administration of FYW courses conscientiously seek to create equitable learning spaces for all students, implementing accommodations that support intellectual development and individual growth. Though they do not include rural students or digital inequity in their Statement on the Opportunity to Learn (2019), the NCTE calls for writing educators to actively pursue both justice and equity, their position statement reading:

“As an organization comprised of literacy educators and researchers, we acknowledge that language and literacy learning are basic human rights and essential tools to deepen every student’s consciousness and widen possibilities for all students’ access, power, agency, affiliation, and impact, across their lifetimes. Regardless of the communities in which students live or attend school, their backgrounds, or the way they learn, literacy educators must provide all pupils the opportunity to use language and literacy in critical and empowering ways that address and surmount students’ varying needs.”

To conclude this chapter, it is my sincerest hope that the voices of rural students who are experiencing technological inequity in FYW spaces are elevated and amplified through their participation in this study. I also endeavor to serve as an advocate for all rural students, imploring that they would be provided with equitable digital access and accommodations that would aid in their opportunity to pursue success in FYW courses. In accordance with the NCTE call to action, the implications of the above results will be thoroughly explored in the penultimate chapter of this dissertation, with the conversation centering on rural student

empowerment in FYW courses through the provision of digital equity solutions. The recommended solutions to the obstacles faced by rural students are actions that can be taken at the institutional, administrative, and instructional levels, all of which seek to support equitable and empowered learning for rural students, while also disrupting the pedagogical and institutional structures that keep this student population in a place of inequity.

Chapter 6: Further Implications and Conclusion

Study Implications Overview

Though the benefits of multimodality and technology use in FYW have been well studied and proven through the successful integration of technology into composition pedagogy and curriculum, the results of this study have shown that for rural students, these benefits are often not accessible due to technological inequity. Through the course of this research, it has been demonstrated that students who identify as being of geographically, digitally, or mixed rurality are both marginalized and negatively impacted by the requirements for technological knowledge, ability, and access as implemented in FYW courses. These requirements, both those that are implicitly expected and those that are explicitly communicated at all levels of the educational hierarchy, have helped to maintain a status quo of inequitable education for this student population, something which begins in their pre-collegiate years in K-12 and persists through their time in University. Though this study was limited to one semester at one university, I believe these results are broadly applicable outside of this sampling as they are representative of the common power structures and subsequent technological obstacles experienced by rural students.

After reviewing these results, the primary obstacles faced by this student population can be summarized in the following three points:

- Inadequate technological education and preparedness
- Inadequate access to technology and the internet
- Inconsistently defined and poorly communicated technology requirements

With both the existence and significance of these obstacles having been established throughout this disquisition, the remaining question posed is this: what

can be done to ameliorate the technological inequity and the resulting digital exclusion experienced by rural students in FYW courses, so as to empower them to be successful their learning?

FYW instructors and writing program administrators are in a unique and incredibly challenging position in that they shoulder the burden of responsibility for creating classroom environments that are able to support the varying needs of all students. The Core Writing program at UNM is exemplary in that it strives to place equity and inclusivity at the center of its curriculum design, using current pedagogical best practices to provide such a space. The faculty and staff consistently perform emotional labor in the context of justice, equity, accessibility, diversity, and inclusion (JEADI), challenging the status quo and integrating practices that support their student population to the best of their abilities, something that is demonstrated and communicated through the language used in the Core Writing and course descriptions, as well as in the FYW SLOs. As reaffirmed by Sealey-Ruiz,

“Literacy educators are in a unique position to interrupt the violence, pedagogical injustices, and misrepresentations [that interfere with students’ opportunities to learn]. The tools we have at our disposal (writing, visual arts, spoken word, and other modalities more readily accepted in English and literacy classrooms) provide an outlet to discuss, critique, and dismantle [these inequities]” (2016).

While these classrooms exist as places where inclusivity and equity are cultivated, this discipline does not have the hierarchical power or authority to unilaterally enact change at the institutional level. These instructors and administrators are able to, and do, enact equitable change within the discipline through their use of equity-minded pedagogical practices, but creating technologically equitable educational opportunities for rural students should not be

solely the responsibility of literacy educators in FYW spaces. In order create technological equity for rural students, the educational hierarchy that first placed them in this inequitable position (and continues to perpetuate said inequity) must be disrupted and held accountable for creating broadly tangible solutions.

With this in mind, I want to shift the onus of responsibility for creating and implementing the preponderance of tangible solutions from FYW instructors and place more of this responsibility to institutional, State, and Federal entities. In doing so, the weight of JEADI emotional labor and solution generation would also be more evenly distributed among the educational hierarchy. These suggested solutions are:

- Formally recognize rural students as a vulnerable, marginalized population at the Federal, State, and Institutional levels
- Required computer literacy education in K-12
- Funding to create and expand programs for computer, hotspot, and Wi-Fi access for rural college students

In seeking to re-distribute the responsibility for creating technological equity for rural students, I also would seek to ensure that these solutions would not add to the already-overflowing plates of FYW instructors and WPAs. For instructors and WPAs, aside from demanding action from institutional, state, and federal entities, secondary supportive measures would be:

- Ensuring that technology requirements are clearly defined and communicated on the Core Writing website, in the course descriptions, at new student orientation, and in the syllabus at the beginning of term, with resource suggestions for those who may have accessibility issues
- Including the implications of digital inequity in instructor training and as part of Core Writing orientation at the beginning of each school year, with the concepts of universal compatibility and student choice in digital tools being core suggestions for supporting accessibility
- Implementing a standard of weekly computer lab time for all FYW courses that are not regularly held in computer labs

The aim of this chapter is to respond to this question by examining the implications of technological inequity experienced by rural students, as well as proposing solutions to address this inequity at various levels of the existing educational hierarchy. Based upon the resulting data from this study, I will first re-identify the primary obstacles and the subsequent implications faced by rural students in FYW classrooms, discussing how the implications of these obstacles impact this student population in a negative way. I will then propose the above solutions and supportive measures that should be considered or implemented at the Federal, State, institutional, and classroom levels for each obstacle,/ so as to make FYW technologically accessible and equitable for rural students. Finally, I will conclude this dissertation with a call to action, supplicating that literacy educators and the collegiate, State, and Federal institutions in which they serve, function as a consortium of sorts, supporting and building out technologically equitable opportunities for rural students, starting in the FYW classroom and expanding outward.

Implications of and Solutions to Inadequate Technological Education and Preparedness

The analysis of student data in this study identified a correlation between formal, school-based technological education and heightened student confidence and performance, as well as a correlation between informal or inadequate technological education and poor student confidence and performance. Based upon the results of this study, it can be conjectured that the lack of digital literacy requirements (and therefore formal, school-based educational offerings) in the New Mexico K-12 educational system disproportionately impacts rural students, placing them in a place of educational inequity in comparison to their urban peers. This inequity in receiving foundational technological education has far-reaching negative implications for this student population, most demonstrably, their preparedness for university-level technology requirements.

While the first thought might be to implement sweeping measures, such as removing baseline technology requirements and creating options for fully analog courses, these are not viable or reasonable solutions to the existing issue for the following reason: doing something of this nature would result in erasing one of the only places this student population may have to practice with and learn a variety of technological skills that they can apply to other contexts and disciplines. As previously discussed, digital inequity and lack of technological proficiency are not problems rural students experience solely in FYW courses; in fact, several students who participated in this study reported that they struggled with technology in their courses across the board. The difference, however, is that the issue of technological inequity is unlikely to be explored or addressed in other disciplines, simply because

they are not equipped materially or pedagogically to do so in the way that FYW is. The core tenets of writing pedagogy are built around creating inclusive, equitable classrooms where students can share their authentic voices, something that is not centrally integrated across other curricula in other disciplines.

It has been reiterated throughout this project that just because students may now exist in a predominantly technological era does not mean that they have equal access, learning experiences, or digital proficiency. In order to address this issue, there are three solutions that I would like to propose. First, I contend that it is of paramount importance that rurality be officially recognized as a vulnerable and marginalized population at all levels of the educational hierarchy. In doing so, this action would, in many instances, qualify educational institutions to have access to allocated Federal and State funding that support technological equity for this student population, among other benefits (Fraley, 2013). In turn, these institutions could procure the necessary technological tools and supplies to provide the adequate foundational education and experience in technology, bolstering this student population's opportunity to be broadly successful in collegiate, vocational, and other existential spheres.

The second solution I propose to address this challenge is the expansion and timely implementation of the Computer Science Strategic Plan, a standardized K-12 computer and internet literacy program that has been proposed by the New Mexico Public Education Department and is subsidized by Federal funding as part of the Digital Equity Act. In implementing something of this nature, it would give rural students opportunities for formal, standardized computer and digital literacy

education but, due to an interruption in funding and reallocation of funds during the pandemic, the program is significantly behind schedule and is not expected to meet its projected 2026 roll-out completion date (NMPED, 2021). The delay is so major that, to date, the only completed item on the list of published goals is the creation of the plans itself. In order for this solution to be viable, it is necessary for educators, parents, and other community members to call for a timely resolution to this funding issue and program implementation delay. The sooner this program rolls out, the sooner our rural students will have access to the baseline computer literacy education they need, but this is not enough. Students and instructors alike can't wait around until this (currently theoretical) literacy program comes to fruition; rather, in order for this solution to be successful, it must be compounded by the implementation of other, timelier, solutions, as discussed below.

The fact that an equitable, K-12 basic computer literacy standard in NM is a minimum of three years away (but likely further) is something that should influence the way institutions implement technology expectations. When enacting technological requirements and when training FYW instructors, it is crucial to consider that rural students are more likely to lack the foundational knowledge needed for technological literacy, and note how inadequacies in that foundational knowledge impacts rural students' ability to acclimate to the technology requirements in FYW courses. With this in mind, my final suggested solution for this obstacle is for instructor training in digital equity. This supportive suggestion would call on all FYW instructor training programs to include a unit specifically on digital equity. At UNM, this may look like the implementation of a more robust digital equity

unit in new-instructor training, and a digital equity “refresher” activity as part of Core Writing orientation at the beginning of each school year. This training unit would discuss the negative impact of digital inequity, concepts of universal compatibility for digital tools and devices, and how student choice in those tools and devices are integral in supporting technological accessibility.

In order to assist with an initiative such as this, it’s important to recognize that digital equity *is* discussed in FYW composition pedagogy courses and initial instructor training at UNM; this solution is simply calling for an expansion to the existing information and practices. To aid in this expansion, the data from all students in this study, both urban and rural, has been aggregated into a report for the Core Writing department which details student experiences with technology in FYW courses, thus enabling the department to assess prescribed technology practices within FYW courses and if/how those practices align the SLOs with the following OWI Principles and Effective Practices (2013):

Overarching Principle

OWI Principle 1: Online writing instruction should be universally inclusive and accessible.

Instructional Principles

OWI Principle 2: An online writing course should focus on writing and not on technology orientation or teaching students how to use learning and other technologies.

Institutional Principles

OWI Principle 10: Students should be prepared by the institution and their teachers for the unique technological and pedagogical components of OWI.

Research and Exploration

OWI Principle 15: OWI/OWL administrators and teachers/tutors should be committed to ongoing research into their programs and courses as well as the very principles in this document.”

The SLOs in UNM's FYW courses aim to be as inclusive as possible for the student population, their language being informed by various resources that demonstrate student-centered composition pedagogy. Additionally, the Online Literacy Instruction Principles and Tenets (2019) call for inclusion and access for all students, stating:

"Inclusion and access require providing proactive, equitable, and appropriate support to individuals with physical, mental, and emotional limitations and challenges; different learning approaches or preferences; multilingual, multicultural, and economically diverse backgrounds; as well as those who are geographically distributed and for whom a bricks-and-mortar campus is unavailable. Inclusion and access involve using multiple teaching and learning formats, engaging students' choices, and welcoming all students in the course.

While not all FYW courses at UNM are taught online, it has been established that all FYW courses use technological components, and all FYW courses follow the established SLOs that are aligned with these Principles. In order to truly align with these principles, FYW classrooms must present rural students must with equitable technology options, something instructors can assist with, but only if they're aware of the issue to begin with, and are given the resources and practices needed to help this student population. Because FYW instructors and WPAs at UNM are already trained in, and strive to promote, equity among all students, I would suggest that the training be expanded to specifically discuss how large the rural student population is (and thus the significance of this issue), how this student population is impacted by the digital inequity currently inculcated in FYW technology practices. This expanded training could also include practical, supportive measures (as discussed in the next section) that would help to positively effect change, putting rural students who may

be struggling to acclimate to the FYW technology expectations, in a more equitable space alongside their urban peers.

Implications of Inadequate Access to Technology and The Internet

As was also demonstrated by the results of this study, rural students are six-times less likely to complete FYW courses than their urban peers. The substantial disparity in completion that is experienced by rural students, in conjunction with the high rate of rural students reporting inconsistent technological access, demonstrates that the current FYW technological practices are not a tenable option in seeking educational equity for this student population. This is an unfortunate catch-22 because, despite the intention of using technology as a tool to support equity for all students, it is demonstrated to put this subset of students at an inherent disadvantage and, in fact, works as a barrier to their success.

Additionally, while universities across the country, including UNM, purport to being intrinsically equitable and inclusive, the information for diversity and equity are often available strictly online, which, somewhat ironically, is exclusionary of students who do not have adequate or compatible technology needed to access the websites. For example, the Aspirational Statement, as published by UNM's Division for Equity and Inclusion (2023), notes that UNM campuses should be “inherently inclusive, accessible and readily accommodating” to people of all races, religions, ability/disability status, ethnicities, genders/gender identities, sexual orientations, first-generation college status and, “all other categories/identities.”

The final tagline of this statement, while it attempts to be encompassing, ends up tethering the institution to a commitment that it has not met—technological equity for all students. Though other sections of the website detail certain initiatives and some resources, neither rural students nor students who are technologically disadvantaged are acknowledged in any capacity, something which speaks to the

assumption that all students have access to the technology needed to access this information. Both this vague lumping of “all other students” in the inclusivity language, as well as the fact that information about possible resources is not easily accessible to those who do not have adequate access to technology speaks to the concept that rural students and the digitally excluded were not outwardly considered in the equity equation. In order to address this issue and usher in true institutional equity, the immanent institutional assumptions regarding technological access must be put in check and these students must be given equitable technology access.

Aside from implementing the solutions as proposed in the previous section, the first solution I propose to address the obstacle of inadequate technological access, is to call for the creation, expansion, and implementation of programs for computer, hotspot, and Wi-Fi access for rural college students. The Affordable Connectivity Program is one such option at the federal level that would benefit rural college students, both before and after they enroll in university. It is an FCC benefit program that helps ensure that households can afford the broadband internet needed for work, school, healthcare, etc. The benefit provides a discount of up to \$30 per month toward internet service for eligible households and up to \$75 per month for households on qualifying Tribal lands. Additionally, under this program, eligible households can receive a singular discount of up to \$100 to purchase a laptop, desktop computer, or tablet from participating providers if they contribute more than \$10 and less than \$50 toward the purchase price. Their eligibility parameters (2023) state:

“A household is eligible for the Affordable Connectivity Program if the household income is at or below 200% of the Federal Poverty Guidelines, or if a member of the household meets at least *one* of the criteria below:

- Received a Federal Pell Grant during the current award year;
- Meets the eligibility criteria for a participating provider's existing low-income internet program;
- Participates in one of these assistance programs:
 - Free and Reduced-Price School Lunch Program or School Breakfast Program, including at U.S. Department of Agriculture (USDA) Community Eligibility Provision schools.
 - SNAP
 - Medicaid
 - Federal Housing Assistance, including:
 - Housing Choice Voucher (HCV) Program (Section 8 Vouchers)
 - Project-Based Rental Assistance (PBRA)/Section 202/ Section 811
 - Public Housing
 - Affordable Housing Programs for American Indians, Alaska Natives or Native Hawaiians
 - Supplemental Security Income (SSI)
 - WIC
 - Veterans Pension or Survivor Benefits
 - or Lifeline;
- Participates in one of these assistance programs and lives on Qualifying Tribal lands:
 - Bureau of Indian Affairs General Assistance
 - Tribal TANF
 - Food Distribution Program on Indian Reservations
 - Tribal Head Start (income based)”

Though this is but one example of the programs that would assist rural students in achieving technological equity, it's important to note that it serves as an example of how many of these assistance resources still have major gaps that continue to perpetuate digital exclusion. In this case, many students would not meet the eligibility guidelines (especially if they still live with family or are claimed as financial dependents), not to mention that a discount of this nature may not be substantial enough to meet the financial constraints many students have. For the students who *would* benefit from this type of resource, communicating the existence

of such a program is key. For example, if this program were to be communicated in various spaces and various modes at UNM, such as via the division for Diversity, Equity & Inclusion, by the IT and Library Services divisions, and by the English Department in FYW courses, it's likely that some students would be able to benefit from this program.

Other resources, such as laptop rental through the UNM library system, would assist rural students in being able to procure a laptop but it also comes with limitations. First, there are only 109 laptops available for check-out at all UNM Main campus libraries. Second, these laptops cannot be taken off campus and there is a three-hour loan limit, with all laptops due back no later than the library's closing time. While this may be useful for rural students who are in immediate need of a laptop for FYW work, there are accommodations that could, and possibly should, be made so as to make these devices more accessible to this student population.

Another option that could address this need is the concept of a computer literacy course being taught as a co-requisite in conjunction with FYW courses (similar to a Writing Across the Curriculum (WAC) program), or the implementation of a FYW course that is themed to explore digital literacies. This is something that could help give students the digital literacy and technological access they need, while also ensuring that FYW instructors would not need to teach the technology. A program of this nature has been launched at The University of Colorado at Boulder, though its efficacy has yet to be studied. Unfortunately, programs of this nature are difficult to implement due to the cost and time associated with curriculum development (Ball, 2018), not to mention the issues that can arise from trying to

change undergraduate course requirements. While it would be an option that could address both issues of digital literacy and technological access, and could be feasible in the future, at present, its cost and logistical constraints prevent this idea from being something that could be implemented to immediate benefit.

The second solution I propose, however, *can* be implemented to immediate effect and is an expansion on the concept cited in Chapter 3: both face-to-face and online writing labs for FYW students. This practice, as detailed by Hewett, Bouelle, and Warnock (2022), centers both types of labs as “spaces where students can receive personal assistance with their writing...that may not have been available to them” with the goal being “to guide student writing rather than fix it and to support developing writers.” Though this practice has been shown to be extremely efficacious, I would argue that holding these labs at times outside of the student-registered schedule is exclusionary in that many students are unable to attend extramural sessions beyond their class time, something that many of the rural students cited as a/the reason that they are unable to access computer labs or library computers. While the overarching goal of these labs, per the authors, is to give students writing support, I strongly feel that for rural students, the benefit of these types of labs would be two-fold: students would have consistent technological access, as well as support for learning both written and technological literacies from their instructor, thereby addressing both issues of inadequate access and proficiency.

To achieve these benefits, I suggest that implementing consistent, weekly computer lab sessions for *all* FYW courses, regardless of them being labeled as in-

person or hybrid, is a practical solution with the potential to garner immediate results for a wider constituency of students. While it would be ideal to hold every FYW course session in a computer lab or computer enabled classroom, because there are so many sections of FYW courses, this is likely not feasible as these classrooms and labs are not prevalent on campus and, as such, are in high demand. Instead, I would call for weekly sessions (during class time) in a computer lab or similar, giving students, at a minimum, weekly access to a full-size computer and internet, during a time that is built into their schedule. It may seem like a small action, but for students who are otherwise completing class on phones, tablets, or with poor internet connection, the technological consistency and dependability of this solution could make a world of difference for them in FYW courses.

To be clear, this is not a call for FYW instructors to teach students how to use various digital tools and technological platforms, nor should that be the purpose of these labs. As previously noted by both established scholarship (Miller, 2001; Selfe, 2007; Beck, 2013; etc.) and in this dissertation, the focus for composition instructors should *not* be teaching technology to their students, but rather giving students choice in how they create multimodal work while supporting their understanding and use of the technology available. Though the digital literacy gap rural students experience may be wide and while they may need education on technology, it is not the job of FYW instructors to bridge that knowledge gap, but it *is* part of their role to provide accessibility. Until some of these solutions and ideas are considered and implemented, the expectations and modality options should be both defined and

discussed when assigning work in FYW courses, and these labs should serve as a space for technological accessibility and writing support.

Implications of Inconsistently Defined and Poorly Communicated Technology Requirements

The final obstacle that will be addressed in this dissertation is inconsistently defined and poorly communicated technology requirements and expectations. It was demonstrated through the results of this study that despite the majority of rural students knowing “about” technology requirements, very few of these students knew what they were or could identify exactly what they needed to be successful in FYW courses. There were instances of students unwittingly purchasing incompatible devices, as well as students who knew they did not have adequate access to technology, with many of them reporting that they had no recourse for alternative technology use due to cost, schedule, or both.

In looking for “defined” technology requirements, it quickly became apparent that they do not exist in that capacity at UNM. For example, the University Catalog makes no mention of technology requirements, both the Information Technologies section and the course descriptions being bereft of such requirements, and the Student Rights and Technology section only discussing ethical technology use in relation to student privacy (2022). The only discoverable resource for students regarding technology requirements is the Canvas @ UNM Technology Requirements page (2023). This site is somewhat amorphous in nature, listing many necessary components as “recommendations” for online courses and putting the onus of setting technology requirements on the instructors of individual courses. The opening text on the page asks, “Is your technology ready to successfully complete an online course?” Immediately, this communication is abstruse in that it specifies *online courses* when these requirements apply to *all* courses offered at UNM; every

course offered employs the use of Canvas, not just those that are held strictly online.

Furthermore, the following list published on the same page entitled “Technology

Recommendations and Requirements,” is equally noncommittal in its language:

“Technology Recommendations and Requirements

- To ensure the best possible learning experience, owning, or having reliable access to, a modern personal computer with virus protection is recommended.
- Online courses perform optimally on high-speed internet, particularly with cable and DSL connections.
- Some courses might require the need for a webcam, microphone, and internal and/or external computer speakers in order to participate in group discussions, create and upload video submissions, listen to live or pre-recorded lectures and videos, etc. Please check with your instructor to ask what type of technology might be necessary in order to be successful in the course. Technology requirements may vary from class to class.

Other types of Technology Requirements to be a successful online student:

- Reliable word processing software such as MS Word. UNM students can download MS Office 365 for free. Details on what it is and who is eligible.
- Ability to save files in .docx or .rtf format. Please note that Mac Pages and Google doc files are not accepted for submitted assignments. Both programs have Export or Save as options that let you convert your work to .docx.
- Ability to view course materials by using Adobe Acrobat free file reader and MS Word.
- Regular and weekly access to UNM Canvas and your UNM email account.
- Ability to download and use Kaltura Capture or Adobe Premier Rush, Adobe’s video editing tool. UNM students can download Adobe Premier Rush for free through Adobe Creative Cloud. Note: branch campus students should double-check to make sure your campus is participating.”

The items on this list, though they read as recommendations, have been shown to be requirements. Students cannot fully participate in any courses, including FYW courses, without having access to these items. There are no course options in which the things on this list are not necessary components for success. It’s possible that the language is purposefully diffuse so as to appear nondictatorial, but the

reality of the situation is that without the things on this list, students are going to struggle to meet the demands of their courses.

Aside from the lack of specificity in technological requirements and guidelines, there is a breakdown of communication from the institution to the departments, and then the Core Writing department to the students, specifically in regard to which of digital tools are “allowed” in FYW, and which are not. In much of the FYW instructor training and composition pedagogy courses taught to FYW instructors, student choice and flexibility in digital compositional tools is considered paramount to student success. Per Alexander, Powell, and Green (2012), “when instructors give students the option to choose the modes and mediums they will use to compose, students can take greater ownership of their work and see additional value in such composing.” As such, FYW instructors are urged, in most instances, to empower students by encouraging them to choose the applications and tools in which they want to do their compositional work, being both open and flexible to student requests for alternate digital tool usage requests or suggestions.

The disconnect, however, was seen in the results of this study when several students reported the use of Microsoft Word being a “requirement” in their FYW courses, despite their experience and preference being to use other options such as Google Docs. This resulted in several rural students communicating that their focus was more on the technology than the course content, due, in part, to the difficulty they experienced in learning the nuances of Word. Somehow, there was a breakdown of understanding between Core Writing technology requirements and what these students felt they were required to use.

To further compound this issue, as noted above, the Canvas @ UNM Recommendations and Requirements list states that “Mac Pages and Google doc files are not accepted for submitted assignments.” In this case, it’s difficult to discern what technological guidelines should be, and are being, followed. It appears that while some FYW instructors allowed for varied compositional tools per the Core Writing department ideologies, others may have been following the Canvas @ UNM guidelines by requiring Word in their courses. The only point of clarity in this example is that students, both urban and rural, are receiving incongruent, and even conflicting messages about the technological requirements in FYW from the institution, the department, and their instructors.

Part of educational equity is ensuring that information is adequately and accessibly communicated by institutions to their students (Organisation for Economic Cooperation and Development, 2018). Before this communication can occur, however, the pertinent information needs to be agreed upon and defined prior to dissemination. The solution I suggest as a means of addressing this last obstacle is twofold: first, I call for institutional and departmental continuity in technological requirements and expectations. While these requirements may not be applicable to all courses, it is important that the institution revisits this list and determines which items are required, which are recommended, and then communicates those expectations clearly at both institutional and departmental levels. Doing so will help to alleviate confusion or assumptions on the part of students, giving them the knowledge they need to plan for the technological requirements that will be expected of them in FYW courses and beyond.

The second point to this solution is for broad communication of these requirements. Technology requirements, as well as resources for students who feel or know that they may be unable to meet these requirements, should be prevalent, easy to find, and should maintain continuity at institutional, departmental, and classroom levels. Institutionally, this could involve communicating technological requirements in new student acceptance packets, at new student orientation, and on the IT and Library websites, in addition to the communication listed on the Canvas @ UNM site. For Core Writing, this may involve technology requirements being communicated on the Core Writing website, in the course descriptions, and active training on these requirements, and their pitfalls, as part of digital equity training. Finally, for instructors, this communication could appear on their course Canvas page, in the syllabus, and be part of the initial “onboarding” discussions in class, so they could begin to ascertain which students may need more technological accessibility support in their FYW course.

Suggestions for Further Study and Consideration

There are limitations to all studies and this one, as previously noted, is no exception. Limitations, by design, allow for further investigation of the subject matter, and encourage researchers to consider the central problem under a variety of new perspectives and conditions, rounding out the data and filling gaps in the previous results. The results of this study demonstrated that rural students are more likely to experience inequitable access to technology and the internet, resulting in a lack of technological proficiency in digital platforms and tools that are assumed knowledge at an institutional level. Upon entering the university, rural students with inadequate technological literacies were shown to be deeply impacted by the digital inequity they experienced both prior to, and upon entering, FYW classrooms. From this inequity stemmed a lack of confidence in their technological knowledge and abilities and frustration with the technological expectations, both of which resulted in rural students being six-times less likely to complete FYW courses than their urban peers.

The limitations that emerged during this research, more specifically that of the narrow scope of the study, demonstrated that while these results are significant and relevant, they are somewhat finite in nature because of how and where this study was conducted. To recapitulate, the data gathered and analyzed was from one semester, at one institution, in a state where nearly 30% of the population is geographically rural. Despite the results being broadly applicable to other students in other contexts, the level of narrow specificity that defined the parameters of this study also limited the range of impact these results, and the subsequent solutions, could have on other student populations with different demographics.

Where does the research go from here, though? How can these results serve as an inception point for branching discourse that would help to support digital inclusion and equity for *all* students in *all* disciplines, particularly those that employ multimodality and technology usage? First, I would suggest that the field of composition as a whole should reconsider their stance on the digital nature of multimodality as it has become somewhat outdated. The days of mail-correspondence courses have passed; all student work eventually incorporates or requires the use of one technological component or another. Despite earlier scholarship maintaining the stance that multimodality does not necessarily need to be digital, it has been demonstrated through this study that even if students are creating texts using non-digital modes, those texts are still required to be digitized at some juncture, particularly during the submission and assessment process within the course LMS. While it may be true that multimodal texts can be created without technology, it does a disservice to both students and instructors to continue the narrative that technology is not an integral component to multimodal composition. In recognizing the inherent digital requirements that exist in multimodal composition, it would allow for the generation of more ideas to support technological access solutions and equitable digital literacy in FYW courses.

The overarching limitation discussed the reasons for selecting rural, FYW students for this study and why this student demographic was particularly vulnerable to digital exclusion in FYW classes. I would proffer that in the future, the concepts assessed in this study could be expanded to other institutions, both those that largely serve rural students and those that do not, and then to urban students,

students in sophomore-level and higher writing courses, and even outside of composition courses, to other disciplines. In doing so, the aforementioned equity solutions can be further developed and expounded upon, allowing a broader population of students to benefit from digital equity and inclusion.

Additionally, I would posit that the impact of technological inequity for both rural and urban students should be studied in primary school, particularly how that inequity affects student performance on scholastic activities that are required to be completed via technological means. Testing for Special Education, State assessments, college entrance exams, and the GED are all academic evaluations that have a required technological component (NMPED, 2023). How do students with digital illiteracy and technological inequity, particularly young children, manage these types of examinations? Is there a measurable difference between computer-based and analog testing? All of the answers to these questions are worth seeking, and the results of which would prove to be both interesting and informative for improved technological literacy practices in the future.

Each of these suggested tributary studies are important in their own right as they contribute to the larger body of work that is pedagogy. Some of these suggestions could help to promote the bridge between composition pedagogy and digital pedagogy, leading to a better understanding of how inequitable access to technology and computer education begets technological illiteracy, how inequitable access to computer education impacts learning and assessment at various ages and stages of education, and more. As I transition to my conclusionary statement, I will say that I'm keen to see where this research crops up in the future and I'm hopeful

that it will help to uphold and perpetuate both the preceding and upcoming efforts toward diverse, equitable, and inclusive education for all learners.

Conclusion Statement: Envisioning Equity

This study was able to substantiate its original premise: the imbricated use of technology in FYW classrooms places rural students at an inherent disadvantage, with issues of inadequate technological proficiency and inconsistent access causing a substantial learning disparity between this student population and their urban peers. This was evinced through the analysis of student responses to the rurality survey and the corresponding student final portfolio responses, and the resulting data which was found to support this claim. The rural student participants offered cogent and compelling narratives, telling their stories, and speaking about their experiences with technology in FYW in such a way that the primary obstacles they encountered were discernable by the end of the study. The obstacles of inadequate technological preparedness, inconsistent technological access, and incongruous institutional technology expectations were defined and addressed with solutional suggestions that would serve as supportive steps toward technological equity for rural students in FYW courses.

While the results of this study and the aforementioned solutions may help to place rural students in a more technologically equitable position, this conversation is really at its incipience. At present, FYW is a place that strives to embrace and support students from all walks of life, and they do so by using the digital devices and tools that the majority of these students have experience with because, frankly, this is the way of the future: college students must learn how to write in a variety of registers, genres, and modalities, using a variety of technological tools in order to function in the world at large. FYW classrooms serve as the preeminent formative space where students learn these written communication skills. This study has

shown, however, that rural students are being left at a place of digital exclusion due to the very practices that were established as inclusive pedagogy. The majority of this student population has been shown to be lacking the foundational technological literacy needed to function withing FYW, and when paired in conjunction with their lack of adequate access to the necessary technological tools, many of these students struggled to be successful in FYW, The crux of this problem though, is that these students need to be able to learn the same skills and information in FYW as their urban peers.

All of this said, FYW and composition pedagogy as a discipline perpetually endeavors to learn and grow, listening to the voices of those around them who experience the negative impact of inequitable situations. There is a desire there to reflect upon practices that may be detrimental to their student population, and seek solutions that would empower *all* students to be successful in their learning. FYW instructors and WPAs are often some of the first people to implement equitable, justice-centered practices into their classrooms and curricula, expanding upon their knowledge and understanding based upon student need, truly striving for inclusive “best practices.”

It is to this desire for inclusivity, equity, and passion for student empowerment that I appeal with the solutions suggested in this study. While many of the suggested solutions are big picture, such as the call for rural students to be formally recognized as a vulnerable class at Federal, State, and institutional levels, several of these solutions are smaller-scale, simple, mindful practices and actions that can be implemented at the classroom or Core Writing department level to give

these students a boost. Those more practical actions that I call for are the ones that would have the most immediate effect and, hopefully, a measurably positive impact on rural students. While rural students need their instructors, WPAs, and other faculty and staff to listen to their technological equity needs, I deeply believe that they also need vocal support from their academic community. By demanding, as a collective, that rural students' technology needs be met earlier in their academic careers and continue to be addressed throughout their collegiate careers, I am optimistic that indications of effective change will be experienced by future generations of rural students.

In closing this dissertation study, I make one final call to all levels of the educational stratum, but especially to FYW instructors and writing program administrators: endeavor to be denizens of technological equity. Keep teaching with technology, it's a crucial component to learning in this era, but do so in a way that all learners, regardless of their digital literacy or technological accessibility status, have the support they need to aim for success.

APPENDICIES

APPENDIX A: Core Writing Technology & Rurality Survey

As exported from Google Forms and adapted to Microsoft Word

1. Would you consider yourself as coming from a **geographically rural** community? This is defined as a community with fewer than 2,500 people in a widespread or small localized area.

☐ Yes

☐ No

2. Would you consider yourself as coming from a **digitally rural** community? This is defined as a community that is without or has limited access to broadband internet, but is not an urban community (meaning, the population is fewer than 50,000).

☐ Yes

☐ No

3. If you identified yourself as being from or living in a digitally or geographically rural community, please identify if the area you are from is digitally rural, geographically rural, or both. If you are not from a digitally or geographically rural community, mark N/A.

☐ Digitally Rural

☐ Geographically Rural

☐ Both

☐ N/A

4. Before attending UNM, did you have **consistent** (daily or as needed) access to technology? Technology refers to computers or other similar devices (cell phones, smart phones, tablets, etc.).

☐ Yes

☐ No

5. Before attending UNM, did you have **consistent** (daily or as needed), **dependable** access to the internet? Dependable refers to internet that had no or very few outages and maintained adequate speeds with minimal lag.

☐ Yes

☐ No

6. Before attending UNM, did you receive training or education on how to use computers or the internet?

☐ Yes, at school

☐ Yes, from a parent/sibling/other family member

☐ Yes, from a public resource (such as the library)

☐ Yes, self-taught via external resources (books, video tutorials, etc.)

☐ No prior technological education

7. Were you aware upon entering the university that access to a computer and the internet would be required for your First-Year Writing (FYW) class? If so, please note in the comments box when you learned this information and from whom. If you do not recall where you learned this information, you may leave the comments box blank.

☐ Yes

☐ No

8. Do you currently have consistent and dependable access to a laptop or personal computer? This excludes tablets and phones.

☐ Yes, I own a laptop or personal computer

☐ Yes, I rent a laptop or personal computer

☐ Yes or Sometimes; I use a school-owned laptop or personal computer in a library, computer pod, or other access area

☐ No, I do not currently have consistent or dependable access, but I may buy or rent in the future

☐ No, I do not currently have consistent or dependable access and do not anticipate buying or renting in the near future


9. On a scale of 1 to 5, how confident are you in your ability to use the technology required for this FYW course? This includes your ability to use both the digital tools (ex. the internet, UNM Canvas, etc.) and the technological devices (computer, laptop, etc.) as cited in the course syllabus or as directed by your instructor.

1 Not Confident 2 Slightly Confident 3 Somewhat Confident 4 Mostly Confident 5 Completely Confident

☐ ☐ ☐ ☐ ☐

10. Please note any additional comments you may have below, including explanations or clarifying points for any responses.

ADDITIONAL COMMENTS:



APPENDIX B: IRB Notation of Review Not Required for This Study



Date: 06/16/2022

Principal Investigator: Andrew Bourelle

Student Investigator: Jo Anna Nevada

Protocol Number: [2206006326](#)

Protocol Title: Digitally Rural: Identifying How Technological Inequity
Impacts Rural Students in First-Year Writing Courses

Committee Action: **IRB Review Not Required**

Decision Date: 06/16/2022

As noted above, the University of New Mexico IRB has reviewed your submission and determined that it either:

- does not meet the federal definition of human subjects research according to CFR 45 Part 46; or
- the proposed activity is human subjects research, but UNM is not engaged in the research. UNM IRB approval is not required.

This determination applies only to the activities described in the submission and does not apply should any changes be made to this research. A change in the research may disqualify this research from the current determination. If changes are being considered, it is the responsibility of the Principal Investigator to submit a new project for IRB review.

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