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Digitally Segregated Understanding Technology Readiness In Preparation For Higher Education Success

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Abstract

The Digital Divide is the gulf between those that have access and use of technology and those that do not. The Digital Divide is a multilayered issue impacting low-income persons, low literacy persons, seniors, and persons with disabilities. The new emphasis is on whether people know how to use technological devices and the Internet for multiple purposes, especially to function and progress in daily society. This dissertation study focuses on technology readiness in preparation for higher education, specifically examining: 1) experiences students had prior to attending the HP3 program, 2) factors that influenced student preparedness for engaging in college-level technology based curriculum, and 3) current experiences within the HP3 program. The study used mixed-methods to explore 27 participants' experiences using survey and interview data. Overall, the students in the program, despite low income status, were fairly high in Technology Readiness. Students were capable and experienced in using technology for personal reasons prior to attending college and were aware of the college and community technology supports available to them. Students were challenged by the need to use specific technological platforms within the college curriculum. Learning the specific technologies needed to succeed in completing the HP3 program, and accessing needed supports to do so, proved to be a challenge when considering the dynamics of community contexts in which students live. It is not surprising to find that, through a quantitative multiple regression analysis, results indicate that higher levels of Grit predicted successful GPAs among this sample. In addition, results related to current experiences of the program reveal that the HP3 program staff go above and beyond to support the learning needs of their students through adjusting program components throughout their experience. Future directions include research on empowerment related to technology.

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INTRODUCTION

To bridge Digital Divide gaps and to truly support digital learning for all college students, any transformative initiative in the early 21st century must ensure sufficient technology supports are available for low income students. In addition, these support mechanisms must be tailored to various learning and teaching styles so that learning can take place anytime based on students' learning styles, abilities, and individualized technology plans.

Poor and minority families and their children have less access to a range of resources in society. Although the Internet has become the fastest growing technology in history (Lebo, 2000), poor and minority children are less likely to have access to computers and the Internet at home and at school (National Center for Education Statistics, 2000), and their parents are less likely to have access to them at home and at work (U.S. Department of Commerce, 2000). As a result of inequalities in the educational system, minority students are impacted increasingly by a lack of educational support and economic resources within the communities in which they live. In a recent article, (Klein, 2013) it is noted that Chicago closed down 50 schools in predominantly minority communities due to underutilization and a lack of resources.

As the cutting edge of technology within schools has moved from getting computers and digitizing textbooks to fully and seamlessly integrating technology into one's daily pedagogy, the role of superintendents and other district leaders has shifted to ensure that teachers and students are reaping the benefits. "However, the complexity of these changing roles within school districts has led to implementation challenges. In terms of technology, what districts have to do within a five-year window is still elusive,

but leaders still have to prepare. It's hard for everyone to stay ahead of the curve. In the complex roles that leaders serve in schools, how do they make technology a priority? This conundrum is posed by Brian Lewis, CEO of the International Society of Technology in Education (ISTE). How do we tap into technology for learning? What are we going to have to do in five years? We don't know, and yet somehow we have to equip and support our leaders to address that issue. In many ways, the K-12 world is playing catch-up with the business community and other sectors of the economy in maximizing technology's advantages, says Gene Carter, of ASCD, formerly the Association for Supervision and Curriculum Development. One of the criticisms of many schools is that they are not authentic learning institutions because what happens outside the school environment house differs significantly from what students are exposed to." (Finkel, 2013).

Districts and administrations have to make difficult decisions on how to implement and acclimate students to technology in a time when technology is changing rapidly, especially as there is a push to keep up with the business industry. Districts and administrations have to decide how and when to fully integrate technology into curriculum whereas other sectors have already incorporated technology into the workflow. Therefore, corporate entities expect students to be equipped with the skills that are necessary to enter the workforce. The purpose of this study is to understand the factors that influence preparedness for higher education as well as the current experiences of students who are currently in college programs.

The Digital Divide is a social justice issue that grows daily in low resourced communities. The Digital Divide is a multilayered issue impacting low-income persons, persons with different computer usability skills, and persons who are not knowledgeable about the benefits of technology use. Social justice can be defined as fair, equitable allocation of resources, opportunities, obligations, and power in society as a whole. It is central to some definitions of community psychology (Nelson & Prilleltensky, 2005; Rappaport, 1981). A social justice perspective is often most concerned with advocacy for social policies (laws, court, decisions, government practices, regulations), and for changes in public attitudes, especially through mass media. In thinking about social justice it can be conceptualized in a couple of ways that are helpful for framing the Digital Divide discussion, specifically through the lenses of distributive justice and procedural justice. Distributive justice concerns the allocation of resources (e.g., money, access to good-quality health services or education) among members of a population. Procedural justice refers to assessing whether processes are ethical and fair, such as if collective decision making is included to ensure fair representation of citizens (Pg. 26, Para. 2).

In the 21st century, it is imperative for everyone in society to have access to and knowledge of how to utilize technology for personal and professional endeavors. The social justice perspective from a digital divide purview requires modification resulting in funds for distributive justice i.e. a public benefit for vulnerable populations to obtain and utilize technology. Secondly, a Procedural justice perspective requires amendment of the deregulation surrounding telecommunication policies affording telecommunication companies to dominate the technology market and set prices and rules that impact

vulnerable populations negatively at higher rates than counterparts from higher economic backgrounds.

Understanding the Digital Divide

The Digital Divide is essentially a social phenomenon that is best described as the broad disparities that exist between those who have access to and knowledge of how to use technology, and those who do not. According to the Facts and Figures report of 2015, issued by International Telecommunication Union, the world has seen an eight fold increase in the number of people who have access to the Internet. This exponential growth is worth noting, but we cannot forget that 4 billion people are still completely offline. Despite the gains made in closing the Digital Divide, there are still populations without access to technology.

Internet usage statistics for North America

The Internet is used around the world by millions of people engaging in a variety of activities; however, not all Americans have access to the Internet. Internet statistics for North America consists of 357,178,284 and 213,075,500 Facebook users, 36% of those users in the United States. In America, 53% of population have Internet access and 47% are without Internet access. People from the United States are more privileged than others around the world. There continues to be a measurable gap in America for non-Internet users. Internet World Statistics (2015).

The Digital Divide manifests in several ways across various populations: whether it is an inability to use a computer, an inability to have access a computer, or a lack of access to adequate Internet services. Network coverage plays a significant role in access to technology. The G in Network means Generation of the mobile network i.e. 2g and 3g.

Network coverage refers to how much power users have to send out and receive more information over the Internet. There are two different types: 2g and 3g. Access to 3g means that a consumer would have faster Internet access. These numbers signify the level of Internet access people have, which has implications for ease of access and how much they may use the Internet for their daily needs. 3g networks tend to be more expensive and 2g networks are more economical for low-income communities. Despite the large percentage of urban populations with 3g coverage, more Internet network alternatives are needed to service urban areas without network coverage.

A report by be-bound.com (2013), reported about the use of 2g networks. In this report, they noted that the proportion of the population that has access to a 2g mobile cellular network around the world went from 58% in 2000 to 95% in 2015. This is a significant shift in Internet access in a fairly short period of time. While this network connection speed is not as fast as 3g, using cheaper technology is a good strategy to address the needs of a large number of people.

An example of a cheaper network technology is a 2g network. 2g networks can maintain mobile cellular Internet connectivity and have a dominant role to play in bridging the Digital Divide. Almost 6.8 billion people in the word are within range of such a network and therefore can be brought online without anyone having to deploy additional infrastructure investment programs. Although 3g networks tend to be more popular in urban settings, 2g networks offer an alternative to the mainstream 3g coverage since higher costs are associated with implementation and rollout out of 3g. be-bound.com (2013)

People that live in rural areas around the world have no access or very limited access to technology, and might be unable to utilize technology on a daily basis for personal and professional reasons similar to low-income populations in low resourced communities in the United States. In a report by be-bound.com (2013), the Digital Divide is not only a question of country politics—what policies are in place for Internet usage and cultural differences based on ease of use and affordability—but , it is a question of geographic location. Urban populations have faster Internet speeds, due to advanced network coverage (i.e. 3g network) something that rural areas and low resourced areas do not have because of the cost associated with 3g networks. It is estimated that by the end of 2015, only 29% of the world's rural population will have access to a 3g network, which is just under one billion people. Conversely, urban populations' 3g coverage will be nearly 90%, which includes about 3.2 billion people benefiting from this network. Another reason for lack of Internet access and use-According to the International Telecommunication Union Report (2015). Countries that are developed have computers in homes resulting in 80% of Developed countries having a household with a computer. Countries that are not developed have computers at home resulting in 32% having a computer in home. There are 81% of homes with Internet access in Developed countries. There are 34% of Developing countries with Internet access at home and 46% for the World with Internet access at home. Now lets look at Individuals using the Internet. There are 82% of Individuals using the Internet in Developed countries. There are 35% of Individuals using the internet in Developing countries and 43% of Individuals in the world using the internet. There is still a need to close the gap for 20% of the Developed countries with no computer in the household. The same problem exists in low resourced

communities and homes in the United States, especially in inner city areas where the neighborhoods are predominately minorities, low-income, seniors, and persons with disabilities.

The Digital Divide is a complex social problem that is said to exist and persists as a function of three main socio-economic factors: economic disparities, differences in usability, and lack of empowerment (Nielson, 2013). Those who do not connect to the Internet or utilize e-mail are considered non-users. There are several theories that have been explored in order to explain this phenomenon, and a vast amount of literature cites several contextual factors as the culprits for this technological divide. While closing the technology gap across social groups has been explored, the problem continues to persist.

In a Pew report on Who's Not Online and Why by Kathryn Zickuhr (2013), a survey identified various reasons why adult and non-adults are not using technology. This report found that 15% of adults 18 and older were not utilizing the Internet and e-mail. In exploring why adults didn't use the Internet and e-mail, reports suggest that: 34% of non-users believe there are no reasons for using the Internet, 32% of non-users feel Internet is stressful and not user friendly, 19% of non-adult users state financial challenges purchasing a computer or signing up for an Internet service, and 7% non-adult users lack access to a device for exposure to the Internet. Other reasons why people don't use the Internet or e-mail revolves around mobility limitations and worrying about Internet security. (Zickuhr, 2013)

Chicago Internet Use

Crain's Chicago Business, compiling data from the city of Chicago in 2013, found that broadband access varied widely. The neighborhood with the least amount of access

was Hermosa, located on the northwest side of the city; it reported 36% of usage. North side neighborhoods had the most access: North center had 94% access, followed by Wrigleyville, Lakeview, and Lincoln Park at 93%. A majority of the Westside and the Southeast side had about 50% access. A recent article by the Loyola Phoenix student newspaper stated that Mayor Rahm Emanuel announced that CPS would receive a $ 37.7 million federal grant to increase high-speed Internet access in its schools. With the funding, Emmanuel aims to speed up his plan for making computer science a key part of the CPS curriculum. An alternative use of the funds could be distributed amongst CPS schools that have the least access to technology (i.e. schools with large percentages of students receiving free and reduced lunch). Again, funds can be tailored toward school administration training and supports for technological learning. Furthermore, the Digital Divide impacts institutions and students differently. Institutions are faced with administrative, curriculum and implementation issues while minority and low-income students often face barriers academically and socially based on the type of school that they attended and their family's socio-economic status.

Internet use by income

According to the Pew research center, 87% of all adults in the U.S use the Internet. However, aggregating the data using income levels reveals that only 78% of adults making less than $30,000 per year use the Internet, while at the 50,000 level and up, more than 90% of adults are online. Furthermore, only 68% of adults who did not graduate from high school use the Internet in the U.S, but adults with a college diploma use the Internet at a rate of 97%. Internet

Percentage of U.S Households with Internet Access

Current census data (2001, 2003, 2007, 2009) and the American Community Survey (2013) reveals that in 2013, households with Internet access included: 74% where the race of the head of household consisted of white alone 77%, Black alone 61%, Asian alone 86%, Native American Alone 58%, Hispanic of any race 66%.

Theories Seeking to Explain the Digital Divide

There are several theories that can be used in an effort to understand why the Digital Divide persists. However, three main theories guide much of the empirical, theoretical, and practical literature on this topic. These theories include the social inclusion theory, the social cognition theory, and the constructivism theory.

The social inclusion theory as defined by the World Bank as the process of improving the ability, opportunity, and dignity of people, disadvantaged on the basis of their identity, to take part in society. The social inclusion theory, for example, would mean that in a school setting, everyone would have access to technology and the utilization of technology. Also, in a community setting, people would be able to engage in aspects of society that have integrated technology into processes (i.e. community information, city services, and health information). The absence of rights can exacerbate by the Digital Divide in a school setting where the administration has not implemented the necessary processes for staff training, professional development, or curriculum for students to be engaged in technology on a regular basis.

The Social Cognition theory, used in psychology, education, and communication, holds that portions of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and outside media

influences (Bandura, 1999). The Digital Divide within the social cognition theory context reflects the lack of technology exposure people have in their environment. This lack of exposure directly impacts what they learn. If people are not exposed to technology in school or in community settings, they are less likely to know about technology and how to use it if they do not have access.

According to Concept to Classroom online journal, the constructivism theory is based on observation and scientific study and it is about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. The Digital Divide in a school setting means students don't have adequate access to technology and have not been introduced to the various uses of technology in school curriculum in order to learn and create skills.

The social inclusion theory, social cognition theory, and constructivism theory in an education setting pertaining to the Digital Divide seeks to provide technology access to students in theory; however, if schools are not equipped with technology, students are not exposed to learning about technology. The Social Cognition theory is another indicator of how a lack of technology in a school setting directly impacts how students learn and who they learn from. The Constructivism theory seeks to provide an opportunity for students to learn based on what they are exposed to and to reflect upon that exposure. The Digital Divide in an education setting prohibits students from learning.

While these theories provide a variety of reasons for why the Digital Divide exists, and how we might proceed to address it, these theories also highlight just how complex the issue can be. Whether we have digital differences because of how different

people think, how people learn, or to what extent various sub-groups have equal access to technology resources, it is clear that there are a variety of factors that must be taken into consideration.

Section 2-Individual-level Factors Influencing the Digital Divide

A search of the literature on factors that influence digital differences and contribute to the Digital Divide reveal a variety of, mostly individual level, factors as the culprit. Factors that have been identified include differences across a number of factors: a lack of understanding how individual needs differ by race, gender, age, or SES, rural versus urban areas, and differences experienced across types of schools.

Women have individual level factors such as complications with technology and accessing social networks in rural settings. Women have more complications utilizing technology compared to males. An empirical study by Compos (2014) that sought to examine gender differences studied of 158 women and 104 men, found there were no gender differences in day-to-day technology use (e.g. hours per day on Facebook) and that women tend to be more challenged in use of technology than men. Lesson learned included: there were differences in the amount of anxiety women experienced with technology as opposed to men, for different reasons (Compos, 2014).

Women in rural areas have technology assistance; however, younger women in a higher class appear connected to social networks more than older female counterparts. An empirical study by Rebello (2014) seeking to understand digital inclusion of rural women in social networks main objective is to understand the social support perceived by these women within online social networks and its relation to digital inclusion. The study found 478 women from rural areas of Andalsia, Spain revealed a normal level of technology

assistance with compelling disparities identified in the social support observed by women based on their maturity, class, and work status. The study concluded that woman who are youthful, enrolled in classes, not a parent and who have access to Tuenti a Spanish Facebook and Facebook received an increased rate of social support in their social network. There was also a significant relation amongst the perceived social support and the digital involvement of women in social networks.

Seniors are less likely to use cellphones and Internet than adult counterparts. A study by Compos (2014) that sought to understand generational differences in technology highlighted the preferred types of technology and the importance of technology in participants' everyday lives. The study found that seniors found both cellphone and websites to be not as user-friendly as both middle-aged adults and young adults, senior adults indicated being less anxious than other groups if they discovered they had left their cell phone at home. Also, senior adults are not likely to indicate that technology has incomparably transformed how they communicate with others as opposed to both younger groups. As such, the Digital Divide in technology use exists amongst the oldest and the two younger groups. More technology use by seniors can be facilitated by providing personalized training in community sites.

Students with low socio economic status are least likely to have Internet access in their homes. An empirical study by Ritzhaupt (2013), sought to understand persons with Low Socio-Economic Status and low literacy experience with technology at home. It is important to note that the study revealed: 1. Persons with Low Socio-Economic Status (SES) revealed students with a low SES, with respect to Information Communication

Technology (ICT) literacy, and household members, are least likely to have technology in their household.

Teaching students from low socio economic backgrounds creates technology challenges that are not seen when teaching students at higher achieving schools. In a Pew survey (2016), instructors experience with using technology with low socio economic status students revealed students lack of access to technology caused problems with deploying assignments. The survey helps to understand how instructors of low-income students were more likely to state obstacles to using educational technology effectively than their colleagues in more prosperous schools. Furthermore, it revealed that: 1. 56% of instructors in low-income schools indicate student's inadequate access to technology is a huge barrier for employing technology as a teaching aid. 2. A second study by Pew Internet & American Life Project on the Digital Divide revealed students between the ages of 18-32 use the internet for social networking, communicating with friends, downloading music and other entertainment activities. 3. For students in low-income school districts, insufficient access to technology can deter them from learning the technology skills that are vital to achievement in today's society. Partnering with technology programs will reduce the technology disparities.

Collaborative efforts made between Connect2Compete provided Internet to low-income persons. According to a non-academic article from KQED newsroom Schwartz (2013) sought to highlight EveryoneOn program providing Internet access for all targeting low-income persons. Internet Access for All is a new program targeting low income students. The program "EveryoneOn is a campaign coordinated by Connect2Compete which brings together partners from both the public and private

sectors to address some of the most vexing aspects of the Digital Divide. Amongst its highlights: 1. The program offers low-cost devices and Internet service, as well as access to digital literacy training programs around the country. 2. Hoping to give access to the estimated 100 million Americans who have no broadband connection at home and another 62 million who don't use the Internet at all. 3. Kids living in homes without the Internet are increasingly at a disadvantage as coursework and workplace skills become more dependent on technology. 4. Families with K-12 students eligible for free or reduced lunch can get a free router and unlimited Internet service for less than 410 per month. And there's a deal for households with no kids too: half off the cost of the router and $ for 12 gigabits of Internet service per month. 5. If a family lives in a zip code with a median income of $35,000 or less it immediately qualifies (para, 2-3)

Parents in rural areas who are involved in their children's lives are least likely to experience the Digital Divide. Hsiang-Jen Ming (2013) conducted a study that sought to understand how parents in rural areas cultural capital influenced students experience with technology. The findings revealed that a closer look at cultural capital in rural areas suggests parents that are involved with their children's studies are least likely to be impacted by the Digital Divide.

Students that attend schools with high performance are more likely to use technology regularly compared to their counterparts at low performance schools. A study by Ehrlich, Sporte & Bender (2013) sought to examine the use of technology use in Chicago Public Schools. The study is helpful in understanding that the type of institution students are enrolled in can explain part of the variance in students' use of technology. The study revealed: 1. Students in elementary and high school institutions with high

levels of performance utilize technology at greater rates than students attending other types of elementary and high schools. 2. Considering the performance of students in the institution, students in selective enrollment high schools utilize technology at greater rates than other high school students. 3. Regardless of increased technology usage in students, a moderate amount of Chicago Public Schools use technology at least once or twice during the week for school. On the other hand, 20-30% at no time utilized it or no more than a few times in a given quarter. 4. There are CPS schools that use technology more frequently than others (Ehrlich, 2013)

Factors such as a lack of understanding how individual needs differ by: race, gender, age, or socio economic status and urban areas vs. rural, and differences experienced across types of school: neighborhood, charter, magnet play a considerate role in how one will utilize technology. It is important to understand that wherever a person goes, they are accompanied by individual level factors that can either be a benefit or hindrance to how they adopt technology in their everyday lives.

Technology & Empowerment

Technology has changed the way we communicate, learn, and work. An important behavior and skill people will need is that of technology, specifically the Internet, computers, and hand held device usage. In community psychology, Rappaport (1987) originally defined empowerment as "a process, a mechanism by which people, organizations, and communities gain mastery over their affairs." Rappaport and others adopted a more specific, community-oriented definition proposed by the Cornell Empowerment Group: an intentional, outgoing process centered in the local community, involving mutual respect, critical reflection, caring, and group participation, through

which people lacking an equal share of resources gain greater access to and control over those resources. Dalton, Elias, Wandersman (Chapter 12). Students entering college are faced with an academic environment that is saturated with technology requirements for all aspects of the college experience. First generation students, minorities, and low-income students have added challenges acclimating to college in comparison to white and higher income counterparts. The reasons for the added challenges are: lack of technology at home, limited technology usage in the schools, low-income household, lack of resources in the school, limited support from family about college process. An ideal college experience for students with added challenges encompasses individualized personal and professional supports for students. Colleges and universities are tasked with the responsibility of ensuring equal academic experience for all students regardless of added challenges students are equipped with upon entering college.

Section III: Technology Readiness

As mentioned in an earlier section, students are faced with many individual level factors that influence the Digital Divide at home, school, just to name a few settings due to students background and experiences. This section will first demonstrate case how technology is integrated into educational institutions where students are attending. Secondly, look at institutions processes, programs and workflows for positioning institutions to use technology into the curriculum.

Technology Integration for Institutions

There is a global movement toward integrating technology into schools in an effort to prepare future generations for the tech-based reality of the real world. Some

tools have been developed in an effort to evaluate how well technology is being integrated into everyday functions, and some programs seem to be doing better than others. Regardless of where these efforts are today, however, the literature on this issue helps to identify ways technology integration can be better supported and how research might be used as data to inform learning communities seeking to better the work of integrating technology into educational contexts.

Institutions have begun integrating technology into curriculum. A report by Masego and Kenaetse (2014) examines the integration of technology in medical school settings. It found that the following was helpful: understanding technology integration that has occurred in a variety of contexts around the globe and in different formats and identifying challenges that come with maintaining the technology such as: technical challenges, financial and time costs around selection, procurement and installation. Also, the study found that a multi layered business-like method is important to the favorable organizing and integration of an e-learning programs. In addition, the study helps to illuminate that: 1. In order to provide solutions to the many hurdles involved in e-learning, institutions must realistically assess readiness, be willing to compromise, adjust and be purposeful about saturating healthy critical collaborations and partnerships to bring about invested ownership and resources for projects. 2. In another country, at The University of Botswana, the school of Medicine has developed an e-learning platform. The operation of University of Botswana e-learning program is in the beginning stages and in need of evaluation to determine performance by students and faculty and if it's fiscally feasible for institution. However, more work is needed to incorporate an e-learning platform that can be a useful tool for faculty and students. 3. Additionally, the e-

learning program needs evaluation to determine if it's fiscally positioned to be a tool for e-learning. The implementers also need to look at the long term use of the e-learning program to ensure students and faculty are getting full usage of program and not just the basics of what an e-learning platform can provide (i.e. accessing courses to complete as requirements).

Institutions have a responsibility to integrate technology into curriculum for students. In a non-academic/professional article by Adrian Mee (2014), she sought to discuss how schools need to be equipped with technology. She argues that schools should be equipped with expansive and equitable curriculum. Technology should be incorporated into the majority of aspects of a school's system—not doing so is doing a dis-service to the student and system. 2. Due to the curriculum reform process, more schools are electing to offer computer science and students are enrolling in the course, which can be interpreted as a positive outlook on specializing in technology. 3. A new trend is surfacing at schools: there's a small percentage of schools equipped with technology curriculum and there are schools that are not equipped with technology curriculum.

Teachers are reducing the Digital Divide by removing the need to access technology in the home. A project by Johnson (2014) sought to indicate modification in resources and assignments in order to close the Digital Divide. It revealed: 1. Another way to close the gap; increase access to technology at school so students have a prosperous, universal access during classroom time. 2. Assessing the resources in the community could identify potential resources for free Internet access, connecting parents with entities that provide low cost Internet via telecommunication providers whom make

connectivity affordable based on free and reduced lunch status. 3. Finally, school leadership and districts can go a step further by leasing Wi-Fi hot spots where students access from home.

Overall, deciding to integrate technology into educational settings is a complex decision with several factors to consider, including people, processes, securing and managing instructional and non-institutional resources, as well as learning from performance problems.

Tools for Assessing Technology Integration in Schools

The Technology Integration Matrix is a tool used to evaluate technology usage in classrooms. A web based assessment tool created to maneuver the complicated job of evaluating technology in the classroom. The (TIM) tool, funding stream is the Florida Department of Education. According to report by Allsopp (2007) that sought to understand the experience of 90 instructional Technology Specialists whom used the Technology Integration Matrix (TIM). The instrument was developed to help teachers, schools, and districts in evaluating the access of technology integration in school system and to give teachers, supervisors, and administrators replicas of ways technology can be blended into teaching in significant ways.

The paradigm for teaching has changed; technology is now embedded in a variety of ways to teach students; therefore, teachers have to evaluate technology integration in coursework. A correlational dissertation study by Barbour (2014), examined how today's pupils are being constantly wired to technology. The old pedagogy of lecturing to students may in fact be going out of style due to a multitude of platforms that are tailored toward the World Wide Web. This can lead to: 1. Technology implementation into

academia (courses) has been tied to enhancing student engagement. 2. The Technology Integration Matrix (TIM) has arrived on the educational scene and has garnered the title of a valid method for measuring technology integration in the teacher's classroom. 3. This study brings approval of (TIM) as a likely measure of both the level of technology in the classroom as well as a signal of student engagement. 4. Educators and Institutions using (TIM) to enhance the level of technology in the educator's classroom and potentially advance student engagement for the course. By educators using (TIM), they'll have increased opportunity to enhance student learning and engagement.

Action research is another tool used to evaluate integration of technology in schools. In an article by Dawson, Cannaugh, Ritzhaupt, (2009) revealed action research is a tool for assessing technology integration in schools by assessing learning and evaluating technology use in curriculum and classes. It is well-known that action research provides a number of benefits for teachers in addition to enhanced practice, heightened professionalism and activism for good educational change. Recent research has indicated that teacher inquiry can help teachers to systematically and intentionally study the ways that technology integration impacts student learning. This includes: Action research provides a lens through which teachers may experience conceptual change regarding their beliefs about technology integration practices. 2. Action Research for Technology Integration (ARTI) in an online tool designated to support the aggregation of action research results from many classrooms. 3. The work of teachers are seldom dispersed beyond the institutions or districts; however, this tool allows for this level of information sharing and exchange of lessons to be learned about how to best integrate technology into classrooms.

While we are only beginning to understand how to best integrate technology at multiple levels across institutions, there are overall lessons learned in the literature. A study by Mackinnon (2013) that sought to identify the resources and trainings institutions need in instructors integrating technology into the classroom. The study emphasized: 1. Having access to a projector in the school environment along with a laptop computer can aid in advancing ideal paths to technology. 2. Professional development operating from a constructivist's knowledge and teaching perspective, faculty member opportunity to think diversely about how technology may raise teaching objectives. 3. Having ample resources available can supply a one-on-one mentorship with an "academic computing specialists" ultimately aiding in closing the gap amongst teaching and the technological tools that are useful in the direction of learning best outcomes. 4. In equipped technology space, instructors resume to clash to use technology in influential and creative approaches to teaching. 5. Under developed countries have additional challenges i.e. lack of infrastructure very important to build technology form constructivist standpoint.

Infrastructure supporting the use of technology in various aspects of the school context can only enhance the opportunities for student engagement with technology in and outside the classroom. A dissertation by Bachenheiner (2011), identified an evaluation model for a Northern New Jersey School district's Digital Backpack program. He concludes that: 1. Staff we're helpful as limited volunteers, internal coordinators were helpful for professional development and support. 2. Flexibility and appropriate tools point to higher technology integration. 3. Professional development for teachers was most helpful when focused beyond learning technology tools but also provided teachers

the latitude, advocacy, and incentives to take pedagogical risks within their course curriculum and classrooms.

The current body of scholarship about institutional-level technology integration, reveals that schools are dealing with both a high learning curve, and an urgent need to become as tech savvy as possible, both for the benefit of their teachers and students. The evidence highly suggests that K-12 schools are the key to ensuring that students are technologically ready for tech-based higher education experiences, tech-based employment opportunities, and, at minimum, to be active citizens of our increasingly tech-based communities. Administrative support for teacher development and implementation of technology into the classroom is likely varied across school districts, leading to varying levels of teacher comfort with using technology in their classrooms.

In summary Students with individual level factors related to the Digital Divide (technology use) face a new environment upon entering higher education. Institutions of Higher Learning have integrated technology into curriculums and, therefore, students with different individual level experiences and backgrounds are attending these institutions and have to learn or be left behind in institutions that have expectations that some students are equipped or capable of adjusting to the new demands of higher education.

Teacher comfort with Technology

Individual level factors related to the Digital Divide impacts teacher comfort with technology in the following ways: how teachers teach, create curriculum, receive training, and disseminate information to students.

Instructors are experiencing difficulty incorporating digital learning in the classroom. An empirical study by Wendy Barber (2014) looked at Online learning and flipped class room models present pedagogical challenges to instructors in developing a sense of community within digital learning environments. She asserts that instructors battle to find contemporary teaching strategies to establish and maintain these flipped and blended digital communities.

Students want more assignments that are technology based, yet teachers struggle to incorporate technology into the curriculum. According to an empirical study by Michele Dornisch (2013), the wedge between student's satisfaction with utilizing technology for learning and teacher satisfaction in utilizing technology for teaching students highlight a need for more appealing technology based assignments and teachers point out a variety of reasons for their reluctance to utilize technology.

Teachers having access to technology doesn't ensure implementation into curriculum when teaching. An empirical study by Reinhart (Year), reveals that access to current technology doesn't guarantee teachers will integrate technology to create or advance to higher order thinking for students. In addition, having training and support from technology aids teachers with utilizing technology to promote higher order thinking, a local technology facilitator needed.

Key stakeholders within educational institutions need to understand how to utilize technology with low-income students. In a non-academic/non professional article, Ed Frankel (2013) that sought to look at the educational system is composed (composition) of school teachers who think outside the box and make knowledgeable choices. He emphasizes that technology has to be utilized especially by students of low socio-

economic status the sooner the technology is available the better. A guide is needed for training and school administrators need a version that encompasses well-trained teachers who are aware of the latest goals and rationale for technological investments.

New technology standards have added a digital designation to students. In a non-academic and non professional article Ribble (2008) references updates to the International Society for Technology in Education (ISTE) revised National Technology Standards (NETS) for teachers in order to understand the revision described by Promote and Model Digital Citizenship which is responsible for computer standards. Ribble draws out the following: Updates in the classroom are needed currently, especially since students are equipped with computer information. The teacher is behind and has to get caught up. Instructors have to become familiar with the tools that students are engaged in and collaborate with their technology faculty if they have any to create a plan for technology integration to produce digital citizenship in their schools.

In order for low-income students to be successful in utilizing technology, institutions will need to join efforts in supporting low-income students. In a project by Ian Quillen (2013), he sought to understand advocacy for low resourced communities. He found that in order for the project to be successful, low resourced communities without adequate access to technology will need advocacy from educators to highlight the betterment of the program. His research also showed that the educational perspective contends connectivity is the objective to guarantee students utilize the leading materials for learning and other federal initiatives within the Education Department should ignite more efficient adoption of “Connect to Compete” program by student’s parents, and educators.

Information Communication Technology tools are utilized in a variety of ways related to teaching evaluation. Balula, A (2014) examined the setting of teaching evaluations, the analysis of literature highlights how interaction occurs in educational context, and how several Information Communication Technology (ITC) are utilized. She discovered that in reality, the curriculum activities deliver the main purpose of promoting the students learning that may entail greater or lesser interaction within the teaching and learning process. Also, consideration is needed for the technology that will give support to the integration of these activities (e-learning platforms). Three dimensions of the evaluation object-e-learning activities-were defined namely the learning, the interaction and the Technology Dimensions.

The Technology Integration Matrix allows teachers to incorporate technology into curriculum for students and to evaluate the students' ability to utilize technology in curriculum. In a project/study by Kieran, Anderson (2014) found the problem delved into a way to boost teacher candidate's adoption of student-centered technology/applications in their lesson planning. Teacher candidates turned in two lesson plans for inspection. During turning both lessons in candidates received Technology Integration Matrix (TIM) to use as a formula to estimate the levels of student engagement inserted in their lessons. The researchers found a statistically significant difference in scores from the first to the second lesson for participating candidates. The candidates' biggest gain were collaborative and constructive technology applications from (TIM).

Teachers are faced with a number of challenges personally and professionally when attempting to integrate technology into the curriculum. The challenges teachers face are related to the Digital Divide factors that impact how students will learn. Other

factors include teacher's readiness for adopting and learning technology and ultimately integrating the technology into curriculum and evaluating the learning experience to determine if students are being successful.

Institutions Partnerships and Collaborations

Institutions have unique opportunities to partner and collaborate in order to remedy the individual level factors that influence the Digital Divide. Partnerships and collaborations provide resources for institutions in order to create and enhance skills for students' success.

A collaborative approach in integrating technology enhances classroom experience for students. A report titled Apple Classrooms of Tomorrow (1995)(ACOT) explored a partnership between public schools, universities, research agencies, and Apple Computer Inc. The classrooms of tomorrow are equipped with a variety of technologies such as: computers, video disc players, video cameras, scanners, CD-ROM drives, modems, and on-line communications services. Furthermore, students are provided with access to a host of software programs and tools, such as word processors, databases, spreadsheets, and graphics packages. Overall, the ACOT experience is embedded with technology serving as a primary tool for learning and exchange for thoughts, partnerships and networking. Lastly, the ACOT research highlights how bringing technology into the classroom provides a higher level of thinking, specifically when used to aid working together, data access and the reflection and identity of student's points and beliefs. Understanding the role of technology for all students' learning styles can lead to institutional change, merging technology, lesson plans with different approaches about learning, teaching, and plans of assessments.

A central location for research pertaining to information technology can serve as a valuable resource for educational settings. In a non-academic article, Cox Niederhauser, Castillo (2012) studies a way to amplify the knowledge and impact of researching information Technology (IT) in education in order to create longitudinal programmatic research that is supported through the establishment of e-learning observatories. These observatories can gather expertise beyond a range of disciplines. One concern in creating a transparent and comprehensible approach for researching (IT) in education is embedded in having a variety of stakeholders with opposite aims, goals, and objectives. Crucial to having relationships amongst practitioners and researchers is sharing information on a two-way continuum with an emphasis on advocacy and leadership from policy makers.

Institutions that have opportunities to partner and collaborate create opportunities to improve learning and creation of skills for students. Partnerships and collaborations is one way to remedy the factors that influence the Digital Divide.

K-12 Students

Students in grades K-12 are exposed to a variety of technology skills when learning. Students who are exposed to technology at an early age have greater opportunities for success. As students progress through school, they have continued exposure to technology which is necessary for personal and professional development. Students who don't have exposure to technology have challenges progressing through school. There are a variety of programs, projects, and initiatives available to enhance students' skills; however, institutions, teachers, and parents play important role in getting students acclimated to technology.

Students are engaged in a number of activities that create skills for future use. A project by Meody Zoch (2014) identified the following activities that students are engaged in as it relates to creating digital authors: posting online, sticky notes, surfing for video clips, creating graphic organizers, and recording their voices. Furthermore, students have dialogue with peers, go through snippets of their writings to their table groups, lend technical assistance to one another, and maneuver back and forth between multiple programs and websites.

Librarians serve as a resource for learning yet they are becoming instinct. In a non-academic article Elizabeth Marcox (2014) argued that librarians are fading from institutions which presents a challenge as common core assessments and expectations are approaching rapidly; as such, this further perpetuates a digital divide.

Using technology properly entails adequate onboarding training. A case study titled Hatch Learning (2010), shows how the appropriate assimilation of any electronic component/computer is eminent to achievement in the classroom. Hatch incorporates computers in a preschool classroom in a universal/comprehensive approach/manner, layered with professional development, and support for both administrators and teachers. Results revealed that electronic component/computer contrived a statistically significant contribution to preparing at risk children with the literacy and math skills essential for school readiness for Pre-K.

Pre-school children face the same challenges as low income counterparts in terms of a lack of technology usage at home. In a paper by Joanna McPake, Lydia Plowman & Christine Stephen (2013) highlighted the lack of research on low-income pre-school children lack of technology use at home. There is minimal literature on pre-school

children's exposure to digital technologies at home and limited communication of the paths in which children grasp these technologies for their own development. The paper concludes that pre-school and early year specialists recognize and respond to the expertise children will have already developed by the time they enter formal education, given the increasing technology of communicative and creative activities, likely to continue over the life course of those born at the start of the 21st century.

Students that can perform a variety of technology skills are more likely to build skills as they progress through school. The earlier students have exposure to technology the more likely they are to improve technology skills, although more research is needed around the impact of early technology exposure to younger students.

College Students

College students who have individual level factors that influence the Digital Divide find themselves navigating through a variety of situations when starting college. A few situations first year college students face are: transitioning from high school to college (i.e.) using a variety of software and applications to complete assignments, selection of classes i.e. making the final decision about what classes to take, and administrative tasks i.e. enrolling in classes online, financial aid completing FAFSA online, time management i.e. balancing work study, course load, and family, and resources i.e. purchasing laptop or computer, just to name a few. Lastly, some institutions are rapidly moving toward integrating technology into a number of aspects of the college experience while other colleges are conducting research to determine the best ways to integrate technology into the college experience.

First year college students need to adapt to a world dominated by technology. First year students who are not technologically savvy, face challenges upon college arrival. A study by Joanna Goode (2010) sought to look at the impact of the Digital Divide on college students, the study was helpful for understanding high school experience with technology. The study focused on computer knowledge of 500 undergraduates students and how skills they brought from high school impacted their early college coursework. Findings include: 1. In the high schools, "some kids are being trained for using technology for academic purposes or they may be taught for low-level vocational uses that makes them good workers but not necessarily good scholars. 2. Even though there is no persuasive pre-requisite for knowing about technology, but once you walked onto campus, you can't enroll in classes, you can't get financial aid, you can't get onto blackboard (a widely used electronic education software suite), you can't answer emails. If you have no technology knowledge, you will not even survive the first week at most university campuses. 3. Many students begin college unprepared technologically but have no ready access for remedial workshops or help during orientation. They are left on their own. If they don't have that knowledge it's one more sense of "I don't belong, I'm not prepared. I'm out of here. This is especially hard on first-generation students who had little technology exposure at home or in high school. The high schools aren't telling them, the college counselors aren't telling them, and it's not until they get to campus that it is a reality. There's no time to go back and catch up on that knowledge. 4. University campuses have the resources, but even today it is only the technology savvy students who seek them out. The students who really need the help get no outreach programs to help them learn about campus technology programs such as workshops, resources and free

software. 5. High schools and colleges, have to start thinking about the Digital Divide from a multi complex perspective and provide learning experiences for students to build their skill set. so they have a chance to be successful in college across majors. (Goode, 2010).

Some students who enter college come from low resourced families and communities causing students not to be equipped with laptops, tablets, etc to work, therefore students need alternative options for accessing technology. A study by Domonell (2013) revealed how institutions are providing tablets and laptops to students who would normally not have access, primarily low-income and first generation students, 78 percent have regular access to a mobile device. And while that number has probably increased, approximately one in five college students who don't have that access. Lessons learned: 1. Students without access face a disservice academically, socially and financially i.e. applying to college and scholarships both online processes. 2. The institution provides two programs that allow students much needed access to books and devices such as laptops, iPads, digital cameras, camcorders, pocket projectors, clickers, scientific calculators and more. The second program loans laptops and tablets to needy students. 3. There are challenges involved in loan program such as setting up the online store for students to shop resulting from limited funding from government. The future of both programs consists of exposure to high school students in conjunction with college application process. (para. 1,8,15, 18,19)

First generation college students in possession or who own a laptop are equipped to stay connected to the Internet and ultimately complete assignments and tasks pertaining to college experience. A professional article by Gordon (2014) sought to look

at how first generation college students have access to technology resources throughout the day by having a transportable computer. The article found the following was helpful for understanding first generation students carrying transportable computer and charger around carryout tasks such as preparing for class and responding to e-mails. Some first generation students do not have access to transportable computers and have to find alternative ways to access technology, not having access creates neglect and literacy difficulties. Furthermore: 1. Students that are connected and mobile have a direct link to homework assignments, internships, friends and their families. 2. The Digital Divide expands more for first generation college students, especially students of color and low-income families. 3. Analysis reveals 24% of students, or 4.5 million, enrolled in postsecondary institutions today are both first generation and low-income students. 4. Resources provided to assist first generation students include a website titled “I’m First” virtual system with information encompassing college searches and the strategy process along with a mobile application providing backing, advocacy and training through college. Supporting first generation students will foster much needed support by providing and fueling leadership potential, creation of jobs, and enhance economic growth for the entire country.

Teachers have observed the differences between well off school districts and districts that are not well off. The districts that are not well of are falling behind in getting acclimated to technology whereas students that have learned about technology are creating skills that will be transferable in college and professional setting. A study by Pew (2013) provided 3 tips for bridging the Digital Divide. 84% of instructors surveyed stated they concurred present day technologies are resulting in increased disparities

between well-off schools and low resourced school districts. The Digital Divide impacts colleges in terms of having inequalities in students skill level related to technology. Students with technology experience are bringing transferrable skills related to smartphone, applications and social media whereas students who don't have transferrable technology skills end up needing more assistance and training with using technology to get caught up to their counterparts and adjusting to college curriculum. Colleges can aid in closing the Digital Divide by ensuring that students are prepared to use technology prior to graduating college leading to greater professional opportunities. Colleges can consider the following options to bridge the Digital Divide for students 1. Assess technology literacy and provide students specific recommendations based on results, 2. Offer courses and training resources for the common technological resources used on campus, and those likely to be of use in future jobs, 3. Provide training to professors to help them recognize, and better respond to, students that may need some additional instruction on using the technological tools deployed in their classrooms. 4. Technology can enhance learning process through college years, however students must first get a firm grasp on the operation side of technology. 5. Students expending extra energy on learning the technology to complete a lesson, rather than the lesson itself are likely to fall behind their peers"(http://www.pbs.org/mediashift/2013/technology-in-schools-still-subject-to-digital-income-divide060.html).

A report by Robert Fairlie (2006) sought to look at immigrant youth and the Digital Divide; it found the following was helpful for understanding immigrant youth and their experience with the Digital Divide. Lessons Learned: for those workers with a

college degree, 85% of employees used a computer at work with 74% utilizing the Internet.

Students from low resourced communities have challenges when in higher education such as college success. In a study by Venegas (2007) that sought to understand challenges for Low-Income high school students from underprivileged schools and their involvements with college access. Lesson Learned: 1. Being empathetic to the impact of digital inclusion on college access motivates voice to the marginalized persons and communities who cannot currently take advantage of information and communication technologies.

The Digital Divide is a complex issue effecting people differently based on age, culture, etc. A study by Cotton (2008). Sought to look at individuals in situations where all have access to the Internet (e.g., a racial Digital Divide exists among college students in the odds of their using the Internet and the different levels and types of usage. Data are from a random sample of fulltime, residential college freshman. Internet experience and gender affect particular types of Internet usage, suggesting that the Digital Divide is multilayered. 2. A policy implication from this study is that bringing individuals into structured environments with assured access may help to decrease aspects of the Digital Divide. Findings indicate that forms of a Digital Divide occur related to individuals use of the Internet more specifically what they use the technology for i.e. coursework, research, e-mail etc. When individuals become acclimated to Internet use, minimal racial differences exist

Students with the least amount of technology access face greater challenges in utilizing technology. A magazine article by Farkas (2016) sought to understand the new

Digital Divide pertaining to students with the least and most challenging access and what it consists of. Article found the following was helpful for understanding smartphone use, for approximately one in five Americans, their mobile device is their primary computing tool. Libraries that loan out laptops provide an even greater service in allowing mobile-only patrons to complete the computer-intensive work they need to do from anywhere, at one particular college, some students structure their completion of school work-and thus their lives-around the library's hours, so being able to check out a laptop and work on a paper anyplace, anytime is a tremendous boon. The ways that patrons are using available technologies continue to change rapidly, but focusing first on serving those with the least and most challenging access may help libraries design a better online user experience for all their patrons. Students need to be equipped to complete personal and professional tasks utilizing a computer because performing such tasks on mobile device is not an option due to functionality. (Para. 2, 9, 10)

College students are utilizing technology for self-directed learning. A study by Caravello, Jimenez, Kahl, Brachio and Morote (2015) sought to compare a sample of approximately 44 first year college students in 2005 and 2015 on Long Island, New York, in their technology preparedness and self-directed instruction. The researchers used a survey instrument including demographic information focused upon students' preparation for classroom technology in high school and college. The first study sought to compare the extent to which students use self-directed instruction relative to proficiency in technology in 2005-2015. Second, the study examined the technology preparedness in high schools and colleges. Third, the study compared the difference in technology preparedness in high school and college between students in 2005 and 2015. This study

asks the following research question: To what extent do first-year college students use self-directed instruction relative to proficiency in technology in 2005 and 2015? The researchers used frequency analysis. Lessons Learned: Results of the study indicate 1. A significant amount of students utilize self-directed instruction to obtain proficiency in the use of technology.

Black and Latino males are least likely to take classes online. A study by Wladis, Hachey and Conway (2014) comprised data from more than 2,000 community college science, technology, engineering, and mathematics (STEM) majors in the National Postsecondary Student Aid Study, this research investigated how ethnicity, gender, non-traditional student risk factors, academic preparation, socio-economic status, and English-as-second-language/citizenship status relate to online course enrollment patterns. Lessons Learned: Even after controlling for other factors, Blacks and Latinos (Black and Latino men, in particular) were significantly underrepresented in online courses 2. Women were significantly overrepresented, and students with non-traditional student risk factors (delayed enrollment, no high school diploma, part-time enrollment, financially independent, have dependents, single-parent status, and working full-time) were significantly more likely to enroll online. 3. Although ethnicity, gender, and non-traditional factors were all important predicators for both 2-and 4-year STEM majors, at community colleges, ethnicity and gender were more important predicators of online enrollment than non-traditional characteristics, which is the opposite pattern observed at 4-year colleges.

Community colleges are adding degrees tailored toward technology. An article by Pagani (2002) sought to look at an associate degree program in computer security,

significant expansion of adult education course offerings, greater emphasis in service to others, concern about ethics in corporate America and writing skills; they found that the following was helpful for understanding part of its business office technology's mission to prepare students for positions requiring extensive business computing knowledge or highly focused specialty training. Lessons Learned: Norfolk Community College (NCC) announced that its new computer security degree program has been approved by the board of governors of the Department of Higher Education, making NCC one of the first colleges in the United States to offer an undergraduate degree in computer security according to the college's Website. The degree is designed to prepare graduates for security careers in the field of information technology equipping them with marketable skills in desktop hardware, software, networks and servers, and a broad understanding of computer and information security" (para. 1-2).

Minorities and low-income persons are least likely to graduate from college due to being unprepared. A report by Swail, Redd and Perna (2003) sought to look at higher education completion rates. African American, Hispanic, and Native American students have always lagged behind white and Asian students, as have those for low-income students and students with disabilities. Although postsecondary enrollment rates for student of color are at levels similar to white and Asian students, access to four-year colleges, especially our nation's most selective institutions, remains inequitable. Beyond access, students of color have not earned degrees at the same rates as other students Lessons Learned: 1. About half of students with dreams and aspirations based on their future receipt of an earned certificate or degree leave with that dream either stalled or ended. 2. Research shows that between 30 and 40 percent of all entering freshman are

unprepared for college-level reading and writing and approximately 44 percent of all college students who complete a two-or-four-year degree had enrolled in at least one remedial or developmental course in math, writing, or reading. Need to have a better understanding of how students have been prepared academically and technologically prior to entering college i.e. comfort with writing, software, applications, navigating between windows and tabs, access to technology and support for technology use. More research needed to understand the academic and technology experience of high school students.

Institutions are responsible for assessing non-traditional students' readiness for technology use and online learning. In a paper by Jesnek (2012) sought to discover challenges that non-traditional students face upon entering college setting, Non-traditional student enrollment, especially at community colleges, has markedly risen in the last ten years due to national unemployment rates, the current economic climate, and employer demand for computer-literate employees. While university instructors struggle to constantly adapt their course materials to incorporate updates in software modules, various online learning systems, and consumer gadgets, they must also troubleshoot the obstacles inherent in their changing class rosters. Non-traditional students are defined as students over the age of 25 who are often first generation college enrollees, displaced from their previous careers due to unforeseen layoffs, or desperate to update their resumes by earning an advanced certification or degree in order to ensure job security. Lessons Learned: Identified requiring an introductory computer skills course as a pre-requisite to general studies courses (and thus upper level courses). Pending the results of a computer competency placement exam prior to enrollment, is a necessity. It is the

responsibility of higher education institutions to adequately gage and appropriately account for different levels of student preparedness upon initial enrollment. Therefore, in addition to math, writing, and reading placement tests, community colleges need to require that all incoming students take a basic computer skills placement test as well. Such a placement test would either exempt the student from taking the introductory computer skills course (thus fulfilling her degree credit requirement) or place her into the introductory course in which she will have the opportunity to learn the essential computer skills needed to function successfully in other courses alongside her peers. Of course, many community colleges already offer developmental computer classes as well, which would allow students who need even more preliminary instruction at a slower pace feel more comfortable upon entering the standard introductory computer course. (Jesnek, 2012).

Low-income students in college enrolled in remedial courses face added challenges when technology is incorporated into curriculum. In an empirical study by Relles and Tierney (2013) that sought to analyze the digital skills of 91 low-income students enrolled in writing remediation and suggest that technological demands widen the equity dimensions of the college preparation gap by aggravating the academic challenges remedial writers already face. Suggestions to support the compound literacy needs of 21st century students are made. Lessons Learned: The data suggest students who are underprepared according to traditional writing criteria face additional barriers to academic success because of low computer skills. The implications are twofold. First, under preparedness may be systemic across discourses. Second, today's remedial writers may be challenged by a kind of literacy double jeopardy that is unique to the 21st century.

Weak composition and computer skills may conspire to obstruct academic achievement. Why Visualization Matters**,** Seventy-two percent of the cohort did not demonstrate visualization proficiency. While posting a profile picture may seem academically trivial, the skill it invokes is critical to online functioning because the Internet is a visual medium. A student who has difficulty with visual lexicons, for example, will have trouble interpreting directional icons and traversing e-menus. Weak visualization stifles the efficiency with which students navigate the Internet and hinders access to its academic resources. Students whose visualization skills are underdeveloped are therefore at a technical disadvantage. The data suggest knowledge gaps. The most effective demonstrations of visualization are the profile pictures that were digitally altered to increase argumentative value. Students who did not know how to operate image-editing software (or even know that such software exists) did not have access to this resource. The principle enforced here is that digital ability is contingent upon understanding what computers can do (and how they do it). If students do not possess a basic awareness of what is technologically possible, they will not be able to use technology to perform elemental functions for academic purposes. Why Appropriation Matters? Of the 43 students who appropriated media, 77 percent did not demonstrate proficiency. As a gauge of technological skill, appropriation signifies the ability to construct online information searches. Because information retrieval is inescapably linked to technology use, online search behaviors impact writers regardless of medium. If students are not agile Internet searchers, their capacity either to appropriate media for online writing situations or to find credible sources that support traditional composition is constrained. Information discernment is also captured by appropriation. College writers must be able to sift

through electronic clutter to choose information that fulfills an argumentative purpose. Understanding basic Boolean techniques that filter information, for example, improves search accuracy and supports online and offline writing quality. Notably, the majority of students abstained from appropriation altogether. Given otherwise full participation in all other skill categories, this finding signals what researchers call "computer avoidance," a behavior associated with digital inexperience. For the 48 students who did not appropriate any media, the implication is that they have limited if not questionable Internet search practices. Why Performance Matters-Unlike paper-based writing, digital writing is not confined to two dimensions. In cyberspace, literacy is a multi-dimensional proposition where the rules of knowledge creation and consumption reflect hypertext. For one thing, users are not expected to write (or read) sentences in a linear order. Embedding (or clicking on) links formally known as hypertext involves zigzagging across sundry textual and visual domains. Performance reflects the circuitous literacy patterns endemic online and signals acclimation to cyberspace norms. 79 percent of the cohort did not demonstrate competency in this category. Low levels of performance imply not only an unfamiliarity with the unique rhetoric's of interactive communication but also a disinclination to access links. Findings suggest minimal levels of Internet experience and an underdeveloped capacity to benefit from hypertext resources. Addressing Digital Literacy Concerns, there are explicit parallels between three discourse conventions associated with college-level writing and three new media literacies identified by digital scholars as core competencies. The findings demonstrate not only the snare of disadvantages associated with weak digital skills but also the constraints on college writing implied by online inefficiencies. The viewpoint that college writing is a dual

discourse enterprise represents an ideological disconnect with academic tradition. Only a generation ago, one did not need to consider new media literacies because writers largely wrote as they had for centuries. The technologies has progressed from quill to typewriter to word processor but the mode of meaning representation remained two-dimensional text. Online technologies, however, have expanded the spatial and modal possibilities of literacy. As a result, engagement with technology fundamentally alters how students construct their identities as writers. The data suggest a cautionary tale in which digital under preparedness poses a hidden threat to students whose degree prospects are already severely reduced by underprepared composition skills. (Relles and Tierney 2013). The learning paradigm has shifted due to the introduction of technology into the educational system.

Minority males attend college assistance sessions; yet, they are least likely to graduate from college. A report by Mangan (2014) sought to understand more than 453,000 community-college students both their primary and secondary educational goals between 2010 and 2012 was helpful for understanding aspirations and outcomes. Minority men are more engaged than their white classmates in tutoring, study-skills sessions, and orientation sessions but report the least success. Lessons learned: 1. Black and Latino men have higher aspirations regarding community college than do white males, but they are less likely to attain their goals of earning a certificate, associate degree and transferring to a four-year institution. 2. One contributing factor to the pattern Minority students tend to enter college with weaker academic skills. For instance, only 14% of black students and 30 percent of Latinos meet ACT college-readiness standards in mathematics, while 53 percent of white students do. For reading, the corresponding

percentages are 16, 29, and 54. The issue is not that these students are not capable of doing college-level work, it is that too many of them have not, for myriad reasons, had the kinds of educational experiences that would effectively maximize those capabilities.

In the pursuit of obtaining a college education, minority and low-income students face a variety of challenges pertaining to technology usage, taking online courses, remedial course and graduating. All of the above impact whether or not students will complete college due to lack of adequate preparation.

Summary of Literature Review

The Digital Divide is a multilayered issue impacting people based upon socio economic status, differences in usability and empowerment, the ability for people to know how to use technology in order to improve or enhance their personal and professional experiences. There are individual level factors that impact people daily such as women having complications accessing social networks and having more complications utilizing technology compared to males. Seniors are least likely to use cellphones and Internet than adult counterparts, students with low socio economic status are least likely to have Internet access in their homes, teaching students from low socio-economic backgrounds creates technology challenges that are not seen when teaching students at higher achieving schools, Collaborative efforts are aiding in low income students access to internet. Further more, parents in rural areas that are involved in their children lives are least likely to experience Digital Divide. However students that attend high performance schools are more likely to use technology regularly compared to their counterparts at low performance schools. The next level of education for K-12 students is Higher Education and although institutions have made the adjustments to invest in

technology and create curriculum which reflect new pedagogy there are a number of challenges that exists from determining the impact of technology for student and faculty and assessing the success of such expensive and innovative technologies. Low income students still face a considerable amount of challenges when entering college. In thinking about the experiences of students

Purpose of the Study

Overall, the purpose of this study is to identify the factors that contribute to technology readiness in preparation for higher education. There are two main areas of inquiry: 1) understand what factors influence student preparedness for engaging in college-level technology-based curriculum, and 2) understand what factors influence student preparedness for engaging in college-level technology-based curriculum. Research questions include: 1) What are the experiences of college students with technology-based curriculum? 2) What factors influence student preparedness for engaging in college-level technology-based curriculum?

METHOD

To attend to the multifaceted nature of the research questions of this study, a sequential mixed-methods approach was used (Creswell, 1994). This section will explain the overall research design, provide a thorough description of the program students are participating in, an in-depth description of the quantitative measures, as well as the qualitative measures, and protocols used. A final description of data trustworthiness is explained in an effort to increase the validity, credibility of data analysis, and interpretation of findings.

Research Design

To best answer the research questions, the study used an exploratory mixed methods design where the researcher bases the inquiry on the assumption that collecting diverse types of data best provides an understanding of a research problem. The study begins with a broad survey in order to generalize results to a population and then focuses, in a second phase, or detailed qualitative, open-ended interviews to collect detailed views from participants Creswell (2003). Allowing for validation of information in phase 1. Phase 1 used a survey to identify the factors that contribute to technology readiness in preparation for higher education. (Grit, Tech Readiness, Study Skills, Social Support). Phase 2 involved follow-up interviews from phase 1 to understand the factors that influence the experience of NLU undergraduate students in the HP3 program.

The HP3 Program at National Louis University

NLU is traditionally a commuter school that caters to the needs of professional working adults. However, NLU also provides opportunities for more traditionally college-age students who are looking for a more traditional daytime college experience.

The university is also designated as a Minority Serving Institution (MSI) that seeks to attend to the more culturally-specific needs of minority populations. The NLU Harrison Profession Pathway Program (HP3) is one such more traditional daytime program that provides economical tuition for students who would not traditionally attend a four-year college or university due to academic or socio economic challenges.

The program affords students the opportunity to complete prerequisites for three college degrees offered at the university. The curriculum is structured so students attend classes in person, complete courses online, and attend lab sessions where students can ask more in-depth questions about coursework and technical issues. The first two years are based on a general education curriculum designed to develop knowledge and skills critical for life as well as professional success. Students choose between three curricular paths for their first two years-general studies, education or business. These paths will enable students to proceed in earning their bachelor's degree in any of NLU's undergraduate programs. Classes offered at NLU's Chicago and Wheeling, IL campuses in a blended model (the right balance of online content and classroom activity). Unique support model ensures that each student is provided with the individualized guidance they need to succeed throughout the program. In addition to unique student-centered curriculum design, the HP3 provides each student with a Student Success Coach so they have support such as coaching and advocacy throughout academic experience. Moreover, this program connects students to other general university supports available for traditional college students such as writing resources in the library and online tutorials for challenges associated with technology use.

Phase 1 - Participants

The primary investigator sought students who are enrolled in the HP3 to understand how they were prepared for technology-based curriculum at the college level and evaluate their current college experience.

Phase 1 - Data Collection Procedures

A letter of support from the director of the program was obtained (see appendix A). The researcher coordinated a date and time with the Student Success Coach and student lab sessions. Students were invited to a computer lab to participate in a research study and instructions were provided on how to access the online survey. After the survey was completed, students were given the option to partake in free food provided in a separate room. The study was introduced to the participants, they were informed of the nature of research, assured they would be anonymous, and given the opportunity to decline participation without penalty. The informed consent form was the first part of the online survey (Appendix B), including the Technology Readiness, Grit, and demographic questionnaires. The online survey was administered to students during their class lab time (Appendix C). The participants were informed that results of the study would be provided to HP3 Staff.

Phase 1 - Quantitative Surveys

The primary investigator recruited students from the 3 separate HP3 Student Success Seminar Labs located at National Louis University in Chicago, Illinois. These Labs were held every Wednesday 1-4pm. This sample included approximately 28 men and women aged 18-21. Researcher accessed 28 students from the first year HP3 program. The first phase of this study involved an online survey where 28 participants

from the HP3 Undergraduate program at NLU completed the online survey using the Surveymonkey format.

Phase 1 - Survey Measures

One combined survey included 32 questions to assess 1) Grit Skills, 2) Technology Skills 3) Study Skills 4) Social Support (See Appendix C).A description of each measure is provided below.

Technology Readiness. Technology readiness is defined as having a basic set of skills in computer functionality, prior education and work experience. This measure includes 2 sub-domains assessed on a likert scale of 1-5 (Strongly Agree to Strongly Disagree): 1) Technical Skills (using e-mail) 2) Study Skills (completing homework). Grit Skills separate measure (overcoming a challenge) Social Support separate measure. (Knowing where to get help). To assess Tech Readiness, a total score is calculated ranging from 0-100. Higher scores mean: 100-90 a person is ready to learn Online. 80-89 a person is ready to learn Online but may need to improve in an area or two. 70-79 a person may be ready to learn online but will need to improve in two or more areas. Lower score mean: 60-69 a person is not ready to learn online but with some improvements person can learn online. 0-59: a person is not suited for online learning and a face-to-face class may be a better fit. However, if a person is determined to improve in several areas, this could change.

Grit. Grit is defined as having determination to succeed despite obstacles and setbacks. This measure includes 4 sub-domains (I created these sub-domains) assessed on a likert scale of 1-5 (Strongly Agree to Strongly Disagree): 1) Challenges 2)

Accomplishments 3) Interests 4) Work Ethic. To Assess Grit, a total score is calculated ranging from 1-5, scoring for questions 1, 4, 6, 9, 10 and 12 assign the following points: 5- Very much like me, 4= Mostly like me, 3=Somewhat like me, 2= Not much like me, 1= Not like me at all. Scoring for questions 2, 3, 5, 7, 8, and 11 assign the following points: 1= Very much like me, 2= Mostly like me, 3= somewhat like me, 4=Not much like me, 5=Not like me at all. For a total score of grit you need to add up all points and divide by 12. The maximum score on this scale is 5. A higher grit score means the student has overcome lot of challenges in their lives. Lower scores mean a person has less grit, meaning they have not personally succeeded past many challenges.

Phase 1 - Data Analysis Procedures

Online data was imported into SPSS for further analysis. The analysis consisted of running frequencies, correlations and regressions. The data analysis procedures included the following steps 1: Ran frequencies on demographics and descriptives on variables. Step 2: Create new variables for final variables as used in analysis. Step 3: Calculate scores for new variables. Step 4: Analyze data to obtain Cronbach's Alpha to assess reliability and validity. Step 5. Ran frequencies on new variables created (Fin Grit, Fin Tech Skills, Fin Study Skills, Fin Social Support). Step 6: Ran regression analysis on all variables Fin Grit, Fin Tech Skills, Fin Study Skills, Fin Social Support.

Phase 2: Follow-Up Qualitative Interviews

Phase 2 of the study is designed to understand the patterns and themes associated with Phase 1 of this study. More specifically, it is hoped that a more in-depth qualitative assessment of the students' life context would help to further interpret the levels of tech readiness and experiences of the HP3 program. This phase of the study includes

conducting follow-up interviews with a sub-sample of those students who completed the online survey from Phase 1.

Qualitative Approach

This study used a narrative approach for analyzing interviews in order to understand the lived stories of the students prior to and during their time at NLU. Narrative approach is defined by Michelle Crossley (2006) "the Narrative as an 'Organizing Principle' for Human Life but it is not just the fact that people tell stories in making sense of themselves and others. A narrative psychological approach goes far deeper than that. For example, central to this approach, is the development of a phenomenological understanding of the unique order of meaning constitutive of human consciousness. One of the main features of this order of meaning is the experience of time and temporality. An understanding of temporality associated with the human realm of meaning is entirely different to that encountered in the natural sciences. This is because the human realm of meaning it is not related to a "thing" or a "substance" but to an activity. Everything experienced by human beings is made meaningful, understood and interpreted in relation to the primary dimension of activity which incorporates both time and sequence. In order to define and interpret what exactly has happened on any particular occasion, the sequence of events is important" (Crossley, 2006).

Phase 2 - Data Collection Procedures

The primary investigator assigned ID numbers to all participants in Phase 1 and then pulled a random sub-sample of students from the original 29 surveyed participants. In order to choose the random sample, the primary investigator placed all ID numbers on a sheet of paper, crumbled the paper, placed them in a hat, tossed around and selected 12

numbers. Participants identified from the random selection process received a phone call to see if they were interested in being interviewed. The primary investigator conducted four interviews based on the participants' availability. Secondly, the primary investigator conducted a second round of calls to 8 participants who did not respond to first round of phone calls. Thirdly, primary investigator attempted a third time to contact 8 participants who did not schedule interview or respond to text messages. The primary investigator attempted a fourth time to schedule 8 participants needing to complete interview by calling, texting and sending e-mails to schedule an appointment. (Appendix D). The interview took approximately 30-45 minutes. Each participant received the same interview with no variations in the questions or the number of questions. The interviews were completed off campus in a designated space. The interviews were tape recorded and transcribed.

Primary investigator sent interview questions to Student Success Coach (Appendix E). The interviews were completed via e-mail. The interview responses were read and transcribed. The primary investigator conducted a focus group with HP3 staff to present preliminary results and ask questions to better understand the results.

Phase 2 - Interview Protocol

The main interview protocol for HP3 students contains 17 main questions focused on the following categories: 1) Story of how they decided to attend NLU's Harrison Professional Pathways (P3) program, 2) Knowledge about technology, 3) Previous experience with technology supports, and 4) University Support (See Appendix D for a copy of the full protocol). An interview protocol was also constructed for staff to triangulate findings. The questions for the Student Success Coach included three

questions to assess the benefits and challenges of the HP3 program (See Appendix E). Once it was concluded there was not enough interview data to draw clear conclusions, a focus group was designed for HP3 faculty using a set of ten questions (See Appendix F).

Assessing Measurement Reliability

Prior to analyzing the quantitative data, the measures were tested for internal consistency. The primary investigator has created a 54-question questionnaire to measure students' preparedness for college based on the following variables: Grit, Technology Skills, Study Skills and Social Support to understand what predicts student success (GPA). Each question was a 5-point Likert item from "strongly disagree" to "strongly agree". In order to understand whether the questions for each variable are all measuring what we hope they are measuring, a reliability test was conducted. To assess whether the data form the four variables formed reliable scales, Cronbach's alpha was computed. The alpha for the four measures were: Grit (.717), Technology Skills (.807), Study Skills (.757), Social Support(.867) which indicates that the items forming each scale has reasonable internal reliability. Items deleted for Study Skills, SK43_I could identify Internet safety scams and SK46_In the past I was usually getting help with school. There were a total of 30 items for Technology, 7 items for Study Skills, 12 items for Grit and 5 items for Social Support.

Phase 2 - Data Analysis Procedures

The data analysis procedures used an inductive analysis approach to, (a) condense raw textual data into a brief, summary format; (b) establish clear links between the evolution or research objectives and the summary findings derived from the raw data; and (c) develop a framework of the underlying structure of experiences or processes that are

evident in the raw data. The general inductive approach provides an easily used and systematic set of procedures for analyzing qualitative data that can produce reliable and valid findings. Although the general inductive approach is not as strong as some other analytic strategies for theory or model development, it does provide a simple, straightforward approach for deriving findings in the context of focused evaluation questions (Thomas, 2006). The focus of the following analysis was to look for similarities, differences and themes within the data to understand students experience with technology in preparation for higher education. Step 1: All 29 participants were contacted individually given the opportunity to interview for the study. Step 2: Rapid evaluation method to get data down on paper. Step 3: Started logic model for quantitative data. Step 4: Within case analysis to understand participants as unique case. Step 5: Cross Cass Analysis to identify all the data that answered the 2 main research questions in 2 separate categories. Step 6: Open code. Step 7: Merge quantitative with qualitative data to tell one comprehensive story through conceptual model. Step 9: Schedule meeting with HP3 faculty. Step 9: Analyze data from member checking/focus group. Step 10. Open Code. Step 11. Move data to one of two categories: factors influencing preparedness or experiences of the program now. Step: Incorporate member check and focus group into conceptual model to tell one comprehensive story. The interview responses were read and transcribed.

Data Trustworthiness

Data trustworthiness refers to the process of inquiry and analysis used to ensure the most accurate interpretation of results. Member checking is a technique used in research that helps to enhance a study's credibility, validity, accuracy, or transferability

(Creswell, 1994). This technique involves comparing the investigator's account of the data with those of the research participants, or those associated closely with the research participants' experience (e.g., program staff). Comparing data sources in this way helps to reconcile any gaps or under examined aspects of the data. In some cases, study participants' reactions to the analyses are incorporated into the study findings. This level of analysis is often viewed as the strongest possible check on the credibility of a study's findings (Mays and Pope 2000). In an effort to address the low interview response rate by students in this study, the primary investigator held a focus group with three of the HP3 program staff to help fill in any gaps in understanding students' experiences. While holding a focus group with other students would have been a better approach to filling this gap in understanding, the issue was that all students in the program were inundated with too much data collection and were harder to reach for follow-up. Therefore, staff perspectives were used instead. The focus group conversation was an in-person conversation where the primary investigator presented preliminary study results and asked staff questions that might fill in or explain those findings. Notes were taken by the primary investigator's research chair during the conversation and those notes have been included in the analysis of the data.

Personal Biases

The Digital Divide is a topic of importance to me because I am a woman of color and I was raised in a low-income community in the Chicagoland area. The Digital Divide primarily affects people of color, low-income communities, seniors, disabled persons, and low literacy persons. I had one computer class in high school, several corporate internships, college excel program for High School students and two computer classes in

college. I didn't have a computer in my home until my 1999. I learned about the importance of technology by exposure to corporations and accelerated programs that were not offered to all of my high school counterparts. The teachers that utilized technology for assignments prepared students for higher education. Throughout my college and graduate school years, being employed was mandatory in order for me to support myself. Working full time exposed me to the ever-changing world of technology integrated into many aspects of the work force. It has been 16 years since I graduated from high school and I can say because of my high school community, family and corporate internship experience, I'm technology savvy; however, the Digital Divide is continuing to grow due to socio economic status, low literacy and lack of empowerment.

Results

Overall the purpose of this study is to expand upon an understanding of the Digital Divide as it relates to understanding how students are being prepared for college by identifying the factors that contribute to technology readiness in preparation for higher education. There are two main areas of inquiry: 1) understanding students' current experiences with technology-based curriculum in a college program, and 2) understanding what factors influence students' preparedness for engaging in college-level technology-based curriculum. The following sections of results are presented in an order that makes logical sense for answering these research questions, beginning first with a description of the sample by demographics and an assessment of quantitative measure reliability and validity.

Description of the Sample (n=27)

The study sample consisted of a total of 27 participants (n=27). Of this total, 10% (2/27) of the participants lived and attended high school on the North side. 51% (14/27) of the participants live on the Southside yet 20% (6/27) attend High school on the South side. 17% (4/27) of the participants live on the Westside and 44% (12/27) attend High school on the Westside. 13% (3/27) of the participants live in the suburbs and 20% (6/27) attended High school in the suburbs. None of the participants lived downtown; however, 3% (1/27) of overall participants attended High school downtown

Demographics

Participants range in ages from 18-27. The majority of participants are Black or African American (62%, 18/27) with a small Latino's population (37%, 11/27). The majority of participants didn't feel comfortable answering questions about having children (17%, 5/27) while a small percentage have children (6.9%, 2/27). The majority of participants are single (82%, 24/27), some are in relationships and married (3.4%, 1/27). The majority of participants are employed (65%, 19/27) while some are looking for part-time work (20%, 6/27) and a small percentage are self-employed (3%, 1/27) and looking for full time work (3%, 1/27). Half of participants parents have high school diploma (48%, 14/27) while small percentage have some college (17%, 5/27) and graduate school (6%, 2/27). Some participants did not provide all demographic data therefore information is missing.

Table 1: *Demographics of a Random Sample of College Participants*

	Random sample	
Characteristics	N	%
Gender		
Female	19	70
Male	8	29
Age		
18	8	27
19	7	24
20	5	17
21	1	3
26	1	3
Ethnicity		
Black or African American	18	62
Hispanic or Latino	11	37
Employment Status		
Employed for Wages	19	65
Self Employed	1	3
Looking for Part-time work	6	20
Looking for Full-time work	1	3

Research Question 1: What were students' experiences with technology and technology readiness experiences prior to attending college?

To answer this research question, several of the survey items within the measures are described by percentages to give an more in-depth understanding of experiences participants had prior to HP3 using some basic quantitative data. In an effort to bring more depth to our understanding of participants experiences with technology prior to HP3, the interview data that explicitly answers what their experiences were before college are also provided where relevant. Again, the 4 main areas where participants had the ability to provide data included: 1) Technology Experience, 2) Study Skills Experience, 3) Social Support Experience, and 4) Grit Experience.

Descriptive Analysis

The total number of participants was 27. The mean GPA for participants was 2.7. The TechFinal Rev variable (Technology Experience) has a mean of 3.8. The GritFinalRev variable (Grit Experiences) has a mean of 3.2; participants agree to have overcome obstacles to achieve a goal. The StudyFinalRev variable (Study Skills Experience) has a mean of 3.9; participants agree to have experienced practicing study habits. The SocialSupportREV variable (Social Support Experience) has a mean of 4.2; participants agree regarding the extent to which they have received Social Support when needing technology assistance. Table 2 summarizes the descriptive statistics.

Table 2: Descriptive Statistics

	Mean	Std. Deviation	N
G65_What is your Current GPA	2.7170	.92733	27
Technology	3.8777	.50334	27
Grit	3.2048	.49860	27
Study	3.9810	1.03876	27
Social Support	4.2296	.66264	27

Technology Experience Prior to the HP3 Program

Overall, participants had prior access to computers and internet. navigation. In fact, 78% had consistent and convenient access to computer and Internet. More students than not felt fairly comfortable with technology. For example: 95% of participants felt comfortable logging in and out of e-mail account, as well as sending and receiving e-mails; 86% of participants felt comfortable attaching files; 85% of participants had access to Internet; and one participant mentioned how much he felt competent in using the internet: *"It was very high, if you ask me to look up my grades or GPA in high school, I would've went to it with my eyes closed. (106). In addition,* 2 out of 3 participants tended to use the computer/Internet a few times during the week:

> *"2 days a week. One class online, researching, not actual course but conducting research on computer for the majority of time (125)*
>
> *"At least 3-4 times a week, used computer and laptop in class" (126)*

In an assessment of comfort using Microsoft Word and working with attachments, 82% of participants felt comfortable expressing questions in writing, typing, and word processing; 79% of participants felt comfortable downloading files; and 78% of

participants felt comfortable navigating multiple tabs, Facebook, saving files, and printing documents. In prior grades, 2 out 3 participants took computer classes that likely lead to their comfort levels with technology:

> *"I did take a computer class when I was in high school. It was very interesting, and I loved the teacher. His name was Mr. Martin, the smartest old guy I know. For our final in his class, we had to know at least 30 computer parts." (106)*

> *It wasn't in high school but middle school…class was basic…how to do the basics with Microsoft office suite, etc. it wasn't coding or anything like that…(126)*

75% of participants felt comfortable expressing ideas in writing, working with files. 72% had a computer. 68% of participants felt comfortable jumping between multiple screens and tabs, researching topics online.

> *1 out of 4 received information about the Universal College Application/Common Application from High School Counselor (126)*

Study Skills Experience

Study skills experience refers to the experiences participants had in practicing time management, organization, research, and computer functionality. 68% of participants was able to read and understand college-level reading materials prior to entering HP3 program. 44% of participants prioritized studying in high school. 68% of participants had a place at home that was free from distractions and could be claimed as "mine" for extended periods of study and communication time.

Social Support Experience

Social Support experience refers to past experiences participants have had looking to others for companionship, assistance, or other types of support when attempting to use technology. Overall, it seems participants knew where to get help within the community.

For instance: 81% had someone to turn to show how to fix a problem with computers, software or Internet; 78% had Someone to help them if unable to use computer, someone who understands challenges with computers**,** someone to show them how to fix a problem with computer, and someone who felt confident searching the Internet to fix a problem when challenged. In addition, among the interviews, 3 out of 3 referred to having basic to high level of technology awareness in the community/knew where to go in community for access/identified locations in the community to frequent:

> *"Basic. Mostly, the library. Majority of time went to library. One time went to Starbucks or McDonalds because of Wi-Fi. (125)*
>
> *"There was a library near house, there was a youth center, went there everyday after school and they would walk me thorough how to use technology. Had to use excel graph…had no idea how to do it, but lady help me out because she knew how to do it. (126)*

Grit Experiences

Grit experience refers to the experiences participants have with perseverance and passion for attaining long-term goals. Overall, the Grit experienced by participants was fairly high: 87% of the participants have overcome setbacks to conquer a challenge; 78% think they will graduate; 71% achieved a goal that took years of work to complete; 78% of participants' family were supportive of decision to enter HP3; 70% from the West and South sides of Chicago's low-income areas. From the interviews it was mentioned by 2 out of the 3 participants had challenges that required Grit just prior to transitioning to HP3.

> *"Lack of Finances, scared to go back to school. Primary provider for my mother because we lived together. Afraid to take out loans due to repayment" (125)*
>
> *"Had family health challenges prior to entering college (106)*

It was anticipated that the various measures explored in this study would play a role in the level of student GPA. Therefore, a multiple regression analysis was conducted to examine the relationship between Grit, Technology, Study, Social Support, and GPA.

In order to determine whether there was a relationship between multiple variables Grit, Tech, Study, and Social Support, a one-tailed Pearson correlation analysis was run within a broader regression analysis. The analysis revealed a strong correlation for Grit (p[.494], Technology (p[.673], and Study (p[.538], and Social Support (p[.561]. Table 3 display Correlations

Table 3: Correlations

		What is your current GPA (n=27)	Technology (n=27)	Grit (n=27)	Study (n=27)	Social Support (n=27)
Pearson Correlation	G65_What is Your current GPA	1.000				
	Technology	-2.38	1.000			
	Grit	.494**	-.108	1.000		
	Study	-0.55	.673**	-.111	1.000	
	Social Support	-0.89	.561**	-.001	538**	1.000

**Correlation is significant at the 0.01 level (1-tailed)

Multiple Regression Analysis:

A multiple regression is used when we want to predict the value of a variable taking into consideration the value of two or more other variables within a full model. The variable we want to predict is the dependent variable (outcome variable). In this case GPA is the outcome variable and all the other 4 variables are the possible predictors (Grit, Social Support Skills, Study Skills, and Technology Skills). The adjusted R2 from the table below indicates that the model accounts for 18% (.181) of the variance in the model, and the significance level for this model is .078 indicating that the overall model is not significant. This means that all the predictor variables together do not predict GPA See table 4 and 5 below for details.

Table 4: Model Summary from Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.554[a]	.307	.181	.83943

a. Predictors: (Constant), Social Support, Grit, Study, Technology

Table 5: ANOVA Output from Regression Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	6.856	4	1.714	2.433	.078[b]
	Residual	15.502	22	.705		
	Total	22.359	26			

a. Dependent Variable: G65_What is your current GPA

b. Predictors: (Constant), Social Support, Grit Final, Study, Technology

The multiple regression analysis revealed that Grit was a highly significant predictor of the dependent variable GPA (student success) (β=.485), p=.013. This means that participants with higher Grit scores are likely to have higher GPAs. See table 6 for Regression.

Table 6: Multiple Regression Analysis Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1.509	1.816		.831	.415
	Technology	-.598	.468	-.325	-1.279	.214
	Grit	.902	.334	.485	2.701	.013
	Study	.209	.223	.235	.941	.357
	Social Support	-.046	.312	-.033	-.148	.883

a. Dependent Variable: G65_What is your current GPA

Research Question 2: What are the current experiences of students within the HP3 program?

The focus of the following analysis was to look for similarities, differences, and themes within the data to understand the current experience of participants in the HP3 program. Overall, the story of students experiences of the HP3 program highlight that students utilize technology for a variety of personal and professional reasons, experienced challenges with curriculum technology platform. The following themes: supports offered by staff, university support resources and student feedback to faculty on ways to improve program tell the story of student experiences, supports, and ways we might be better able to support their success within the HP3 program.

I. Students Experienced in Using Technology for Personal Reasons

Although the HP3 program emphasizes use of technology for education purposes, such as completing assignments within specific software programs, 3 out of 3 tended to have experience using technology for different personal reasons such as: playing games, planning travel, editing film, and looking up sports information:

> *"Travel, etc" (125)*
>
> *"I used technology for Final Cut Pro, when I edit film, going on NBA/NFL website, and a lot more stuff. (106)*
>
> *"Use for gaming…Wi-Fi, social networking, keeping up with friends from high school (126)*

In some cases, participants discussed using the internet for applying for jobs and searching for templates to assist others with technology. Two out of 3 would use a template when advising someone to get help with technology:

> *"If helping someone with resume I'd print out resources after conducting Internet search print out resume template (type "Internet template) or whatever they need help with. Help them navigate through process, starting from scratch creating resume first, create a list of skills and what they have done so far than start resume. (125)*
>
> *"When I did my resume, I used Microsoft template and it was helpful knowing what goes on resume…here is the layout and you should follow these guidelines…using template is a good way to start if they haven't created a resume before. (126)*

One participant mentioned that they would use the internet to help others depending on what they needed:

> *"It all depends what they need help with" (106)*

II. Student Challenges with Technology

When asked what aspects of technology participants were uncomfortable using, participants stated they were uncomfortable using D2L tools and online curriculum specifically tied to the work required within the courses of the HP3 program. More specifically, 44% were uncomfortable using Acrobat, 47% were uncomfortable using Dashboard, 41% were uncomfortable Posting for class assignments, 47% were uncomfortable using NLU E-mail, 47% were uncomfortable downloading materials from the sites, and 58% were uncomfortable using discussion boards needed for class assignments.

> *Decent amount have technology access and some don't have access-(Focus Group with staff?*

III. Significant Support Provided by Program Staff

The focus of this analysis identifies the kind of support participants received just as they were transition to the NLU HP3 program and during the HP3 college experience. For example, 2 out of 3 participants transitioned into HP3 program due to support received by program staff:

> *"Teacher support, mentoring, helped me get through process and completing paper work" (125)*

> *"It was the amount of support from teachers, in a small setting and one-on-one support you feel you get 1:1 with teachers" (126)*

Plenty of Technology Support and Other Supports as Needed

Student participants referred to the many ways that HP3 staff supported their learning experience both with the technology and other needs throughout their experience of the program. Three out of 3 mentioned that they had many types of support when needed, such as libraries, stores, friends, and teachers:

> *"Yes, adequate. The library or connection to store where I purchased items…electronic store…target, best buy…if someone purchased something they can get help at store and had questions I would accompany them to store and inquire about areas I had questions about. (125)*

> *"Always. I never really used the support though because I always wanted to see did my friends know. So if they didn't we could go together. (106)*

> *"There's lot of support, all you had to do was ask, they wanted us to ask, math teacher was more than willing to help me. (126)*

One student mentioned receiving assistance with certain assignments, such as writing and editing papers:

> *"Typing papers, editing" (125)*

Another student mentioned how quickly they were able to received assistance from staff:

> *"Other students were waiting, I waited 5-10 minutes to get help." (126)*

Among the focus group data, program staff discussed the many ways they adjusted the program to meet the needs of the students throughout their experience:

> *Program staff adjusted online curriculum when participants demonstrated difficulty in coursework (Focus Group)*

> *Program staff extended online training from 10 weeks to 12 weeks to allow more time for students to adjust to coursework and technology (Focus Group)*

> *Participants not shy about issues with neighborhood. Female Participants have struggles in neighborhood similar to male counterparts…safety, etc. Personal struggles and family struggles less fourth coming. Staff aware of challenges, this one participant matches experiences of several participants-use essays & poems in writing class to learn more about individual participants. (Focus Group)*

IV. How HP3 Staff Could Improve Supports

While the HP3 program staff were noted to be very supportive of student's technology and other task needs, there were some suggestions students made to improve these support services, such as: using a steps approach to teaching technology and providing written materials, and providing opportunities for individual time with professors:

> *Going through information more slower and going through in steps instead of expecting person to understand and get the information right then-and-there instead expectation to work fast through materials. (125)*
>
> *"Receiving materials" (125)*
>
> *"Scheduling help outside of class would be beneficial and having my own time with professor" (126)*

1 out of 3 wanted information explained more/detailed:

> *"It's expected for us to learn when we are in program…maybe they could have explained some parts of it (don't delve into whole thing)…the parts where we answer questions and how we would do it and when we would download certain things. They described things well once we got in there. (125)*

Some more specific ways the program could support students include:

> *"Mentoring – both faculty and peer"*
> *"A more in-depth sense of social belonging as a college student"*
> *"Access to community resources and connections to those resources to promote follow-through"*
> *"Networking – career readiness preparation and access to internships"*

V. Summer Preparation Support

Aside from the various ways the HP3 program support student learning throughout the program, it was suggested that they also provide summer supports. Two out of 3 wanted a summer program:

> *"A summer program would have been helpful. I asked a lot of questions and got through it, not everyone is the same, an optional program would have been helpful for those who wanted to attend. (125)*

> *"Summer program would have been nice instead of just working. School is a good distraction for me, nice to have something to do…i.e. summer classes, sessions to help retain information learned so it won't be lost. (126)*

Discussion

Research indicates the Digital Divide exists on three levels: socio-economic status, differences in usability, and lack of empowerment. The various levels of the Digital Divide is reflected in the results of this study with the following: Finding #1 Gritty Minority Low-Income Students High in Technology Readiness. Finding #2 Differences in usability: Technology and Study experience. Finding #3 Systemic and Social Support Connection to Empowerment. The HP3 program provides an opportunity for participants to improve their socio-economic status, enhance and develop technology skills, and empower themselves by utilizing technology in personal and professional pursuits.

Finding 1-Gritty Minority Low-Income Students High in Technology Readiness

As would be expected our understanding of those most affected by the Digital Divide, and consistent with the literature, this study confirms that low-income and first generation minority college students experience more challenges, such as accessing technology, navigating an academic institution's technology system, utilizing academic resources, and navigating community safety issues in pursuit of their goals. This study confirms attending college is a big step for most students, particularly first generation and low-income college students. These students face additional challenges personally and professionally acclimating to college. The current experience of HP3 participants

highlights some of the experiences first generation and low-income participants grapple with during first year of college in a pilot program utilizing technology for a large percentage of the curriculum. Some of the challenges participants face consists of: living in unsafe communities, attending high schools that are low resourced, living in low resourced communities, and not being comfortable with university online software, etc as described by faculty of HP3 program. These challenges are consistent with an article by Gordon (2014) that indicates the type of tasks first year students have to carry out regarding completing registration, financial aid, and e-mail however students are least likely to utilize university resources to accomplish these tasks due to needing to work to support themselves and family members. First year students are expected to complete a number of tasks related to registration and coursework utilizing technology however most are unable to take advantage of the resources available for completing tasks due to personal obligations preventing students from getting help during regular schools.

We know from the literature that the populations of people impacted by the Digital Divide are low-income persons, persons of color, seniors and disabled persons. Low-income persons often don't have adequate access at home, live in low resourced neighborhoods, and are unable to access university resources during normal business hours due to the need to work. Low-income students also tend to attend schools not adequately resourced to incorporate technology into the curriculum and staff not always properly trained to incorporate technology into the curriculum due to school leadership. Related to the literature regarding the Digital Divide, the participants in this study sample mirror similar demographics. For example, 70% percent of participants are low income, Black and Latino, as well as residing on the West and South sides of Chicago, indicating

that these students would be expected to experience challenges in accessing technology and internet. However, most of these participants reported having access to technology, understanding basic computer/Internet functionality, and know where to seek assistance with technology within the communities in which they reside. These participants reported experiencing a high level of Grit indicating that they tend to overcome challenges in pursuit of their goals. This could therefore be a unique set of participants who have decided to attend a college program with technology curriculum to better themselves and families.

Finding 2- Differences in Usability: Technology and Study Experience

An important aspect of the Digital Divide is usability. More specifically, we know from the literature that persons with higher income are more likely to use the Internet and persons with lower income are less likely to use Internet. Similarly to income level is differences in internet usability among differing race/ethnicities. This is evident when observing percentages of internet use broken out by race/ethnicity: 86% among Asians, 77% among Whites, 61% among Blacks, 66% among Latinos, and 58% among Native Americans according to the American Community Survey (2013). Given that study participants are of minority race/ethnicity status and are mostly from low-income family backgrounds, we would expect this sample to demonstrate similar usage and even a lack of technology knowledge. The majority of participants in the HP3 program are Black and Latino indicating that we might expect participants to experience less Internet or technology usability. However, this is not the case. Most of the students from this study were fairly familiar with how to use technology and the Internet for personal use. These students were less familiar with the online platform they needed to use in order to

complete coursework, but they also knew how to get the technology supports they needed from the HP3 program staff as needed; and technology support was readily available to them when needed. These HP3 students simply just needed to ask for assistance. Therefore, if a student struggled and sought to succeed in this academic program, they would likely be able to do so, they just need to seek out program staff. Data collected from a discussion with HP3 staff confirmed that participants without home Internet access will not be successful in program however the students without home Internet access that figure a way to utilize school resources are better off in the program. The participants struggled with the online platform. Critique of Technology readiness instrument would be that the measure is limiting in that it only shows us their ability to use technology. May need to add a sub-scale to the survey that assesses the acrobat/blackboard.

The Social Cognition Theory, often used in psychology, education, and communication, holds that portions of an individual knowledge acquisition can be directly related to observing others within the contest of social experiences, and outside media influences. Students not exposed to technology in school are at a deficit for learning. Seventy percent of participants in HP3 program have consistent access to Internet and computer, however there are participants that are still in need of Internet access, computer and resources.

This study confirms the reasons adults have complications using the Internet, feeling the Internet is stressful and not user friendly according to a Pew Study. 47% of participants in HP3 program are uncomfortable with D2L platform and Acrobat online curriculum. The study also confirms low income students need to be introduced to

technology as soon as possible, institutions consider partnering with technology entities, and requiring less coursework involving technology at home, an article from Meody Zoch (2014) confirms this position. Allowing the following to occur could improve technology experience for first generation students: collaborative learning, assessments of students' capabilities, and adjusting time when traditional college resources are available to allow students to utilize resources. Lastly, instructors need resources and training when utilizing technology for low-income students. Participants in HP3 have environmental challenges in the community that prevent them from attending class.

The study also indicates students' lack of Internet access at home as a disadvantage. The HP3 Student Success Coach stated that participants without Internet access at home are least likely to be successful. Furthermore, there are participants without Internet access at home, yet they find a way to utilize resources on campus. The majority of HP3 participants face challenges attending school due to unsafe neighborhoods. Middle school students revealed a clear Digital Divide relative to sex, race, and socio-economic status of students. Lastly, instructors have challenges utilizing educational technology with low economic status students according to a Pew survey (2016). Forty Seven percent uncomfortable with D2L and Acrobat. Faculty made adjustments to curriculum yet participants still experienced challenges.

Finding 3- Systemic and Social Support

The Social Inclusion Theory gets at a process of rights to all people, cultures and ethnicities in society. The absence of rights can exacerbate the Digital Divide in a school and community setting. In a school setting, the administration has to properly implement a process for staff to be trained, incorporate technology into curriculum therefore,

students will be engaged a Pew Survey (2016) revealed teachers have challenges utilizing technology with low income students unlike counterparts at schools where students that have higher incomes. This study did not take into account specific questions about students experience with instructors and how curriculum developed in HP3 program. Participants with grit do well in the program.

HP3 Faculty member commented that it is a basic right to have access to Internet and computer in 2016. This study confirms 70% of participants are low-income and attended high schools that provided free and reduced lunch to all students. The participants are resilient based on Grit. The participants low-income status requires more research lack of adequate access to technology in high school is a right missing from schools that are low resourced. The HP3 program are taking steps to provide additional resources for participants by applying to grants and discussing options with companies to connect participants with Wi-Fi services at home, creates tools for students to be successful. Students will have resources that allow them to complete curriculum at home or throughout the city which will position them for success. The study also indicates that schools should be equipped with expansive and equitable curriculum an article by Adrian Mee (2014) confirms institutions need to be equipped with curriculum and devices. The HP3 program is a positioning itself by offering online curriculum. The students are teaching themselves and utilizing resources to empower themselves and remove barriers to technology.

Limitations

The primary investigator had a difficult time reaching participants after several attempts. The following are the reasons the primary investigator was unable to schedule interviews: incorrect telephone numbers provided, voice mails not accepting messages, full voice mails on phones, unavailable due to work schedule and failing out the semester. The primary investigator's lack of rapport with participants may have made it more challenging to access participants. Participants were least likely to respond to an interview request even though the primary investigator mentioned the possibility they would be contacted for follow-up interviews during phase I of the survey collection. The limited number of participants for both stages of this study create limitations in our ability to make generalizations about the study to broader populations and even to fully understanding the true experiences of the participants in the HP3 program. Another limitation the technology readiness scale did not capture comfort level with Acrobat online platform.

Implications for Research and Advocacy

This study has important implications for a multilevel approach to providing solutions to the Digital Divide in higher education. The study identified the personal experiences of participants prior to entering college, the different ways participants are utilizing technology, and the systemic and social supports available. As such, a resolution for the Digital Divide is grounded in resources for low-income students, various approaches for students to utilize technology, and a path for students to transfer skills learned into personal and professional lives empowering them to be successful users of technology.

Future policy efforts for Black and Latino students require a public benefit program for purchase and utilization of technology. A public benefit will provide a set dollar amount for student to receive in order to purchase and acclimate to technology. Black and Latino students have a myriad of challenges requiring a multilevel approach that HP3 program faculty may be able to assess however unable to handle due to challenges beyond university purview. Low-income students require a public benefit program similar to the National Student Lunch program or even Medicaid providing a set dollar amount to assist students and families with the purchase and utilization of technology.

Future research implications should consider measuring empowerment by students accessing and utilizing technology, exploring what type of technology experiences students had in high school. A thorough examination of the technology deficits found in low resourced schools located in low-income communities.

Within the academic system, Black and Latino students have different experiences with technology and often demonstrate difficulty with online learning and how curriculum information distributed by instructors. A customized approach for onboarding Black and Latino students into online learning will aid in reducing the digital divide. The HP3 program are making efforts to improve participants experience by applying to grants tailored toward access to technology, Wi-Fi and creating shared learning spaces for faculty and participants. A culturally sensitive approach to technology use will aid in reducing the digital divide. Lastly, within the research endeavor more information needed to understand the level of academic performance at type of school

students attend in low income communities and how often students use technology for schools that serve 100% free and reduced lunch.

Black and Latino students pursuing higher education in the HP3 program are not assessed on technology readiness and they don't always share issues and thoughts about what they are going through in college related to coursework, anxiety, safety in community, and the cost of college. All of the challenges Black and Latino students face are opportunities to improve upon certain aspects of their lives, specifically by providing them with adequate resources and social supports such as a university's collaboration with technology entities and businesses specializing in technology. This will strengthen the level of assistance provided to students at the university. Upon Black and Latino students receiving the aforementioned assistance, relationships can be built and tools can be used that empower students, families, and their communities to become better digital citizens.

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Appendix A-Informed Consent

Documentation of Informed Consent-Participant
Digitally Segregated: Black and Latino Technology Readiness in Preparation of Higher Education

Thank you for agreeing to participate in this local study on identifying factors contributing to technology readiness in preparation for higher education. This form outlines the purposes of the study and provides a description of your involvement and rights as a participant.

I consent to participate in a research project conducted by Gloria Mullons, a doctoral student at National-Louis University located in Chicago, Illinois.

Purpose of the Study You are being asked to participate in a research study. The study is titled Digitally Segregated: Black and Latino Technology Readiness in Preparation of Higher Education. I understand that this study is entitled Identifying factors that contribute to technology readiness in preparation for higher education. The purpose of the study is to (1) understand student experiences with technology-based curriculum in a college program; and (2) understand what factors influences student preparedness for engaging in college-level technology-based curriculum.

The Interview Process with your consent, you will participate in survey lasting approximately 20 minutes in duration with a possible second, follow-up interview lasting no more than 30-45 minutes. For your records you will be provided a copy of your signed consent for completing survey. I understand that my participation is voluntary and can be discontinued at any time without prejudice.

Use of Participant Data I understand that the results of this study may be published or otherwise reported to scientific bodies, but my identity will in no way be revealed.

Protection of Data & Ensuring Confidentiality I understand that only the researcher, Gloria Mullons, will have access to secured files, transcripts, taped recording and field notes from the interview. All individual interview information will be deleted and ID number used to relate interview data to participant data.

Potential Risks & Benefits-Participating in this study is anticipated to have low-minimal risk.

I understand that in the event I have questions or require additional information I may contact the researcher: Gloria Mullons, 122 S. Michigan Ave, Chicago, Illinois 60603, (312) 719-9834.

If you have any concerns or questions before or during participation that you feel have not been addressed by me, you may contact the following: my Primary Advisor: Dr. Tiffeny Jimenez, National-Louis University, 122 South Michigan Avenue, Chicago, Illinois, 60603, 312; 261-3582 Email address: tiffeny.jimenez@nl.edu. Shaunti Knauth, Chair, Director of Engaged Research, National Louis University shaunti.knauth@nl.edu; 122 South Michigan Avenue, Chicago, Illinois, 60606 312-261-3526.

Appendix B-Technology Readiness Questionnaire

Research Questions:

1) What are the experiences of college students with technology-based curriculum?

2) What factors influence student preparedness for engaging in college-level technology-based curriculum?

Demographics

1. What is your age?

2. Please specify your ethnicity.
    a. Asian/Pacific Islander
    b. Black or African American
    c. Hispanic or Latino
    d. Native American or American Indian
    e. White
    f. Other (please explain_____

3. Martial Status.
    a. Single, never married
    b. Married or domestic partnership
    c. Separated
    d. Divorced
    e. Widowed

4. Do you have children? If so, how many?
    a. 0
    b. 1
    c. 2
    d. 3
    e. 4
    f. 5+
    g. Not comfortable answering

5. Employment Status.
    a. Employed for wages
    b. A homemaker
    c. Self-employed
    d. Looking for part time work
    e. Looking for full time work

f. A homemaker
g. Military
h. Unable to work
i. Combination of a-h. Please indicate which combinations

6. If you live in the greater Chicagoland area, please check one of the following below.
    a. North
    b. South
    c. West
    d. Downtown
    e. Suburbs

7. What is your Zip code?_____

8. Write the name of High School (s) attended_____

9. What is the highest degree or level of school your parents have completed?

    a. No schooling
    b. Nursery school
    c. 9^{th}, 10^{th}, 11^{th} grade
    d. 12^{th} grade, no diploma
    e. High School graduate-high school diploma or the equivalent (for example: GED)
    f. Some college credit, but less than 1 year
    g. Associate degree
    h. Bachelor's degree

Technical Skills Section

Think back to when you started Harrison Professional Pathways Program/NLU, how comfortable were you with your technical skills on the following questions.

1. I was comfortable logging in and out of e-mail account.

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

2. I was comfortable sending and receiving mail.

    5-Strongly Agree

4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

3. I was comfortable attaching files.

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

4. I was comfortable downloading files.

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

5. I had consistent access to a computer prior to entering Harrison Professional Pathways Program/NLU.

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

10. I had consistent access to internet prior to entering Harrison Professional Pathways Program/NLU.

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

11. I had convenient access to a computer prior to entering Harrison Professional Pathways Program/NLU.

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree

1-Strongly Disagree

12. I had convenient access to internet prior to entering Harrison Professional Pathways Program/NLU.
    5- Strongly Agree
    4- Agree
    3- Neutral
    2- Disagree
    1- Strongly Disagree

13. I feel comfortable expressing my ideas in writing:
    5- Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

14. I felt comfortable expressing my questions in writing, typing, and word processing.

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

15. I felt comfortable using Microsoft:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

16. I feel comfortable using Facebook:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

D2L Section

Think back to when you started Harrison Professional Pathways/NLU, how comfortable were you with D2L on the following questions?

17. There are tools in D2L I was uncomfortable using.

Drop box:

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

Acrobat:

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

Dashboard:

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

Posting:

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

E-mail:

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree
Downloading:

5-Strongly Agree
4-Agree
3-Neutral
2-Disagree
1-Strongly Disagree

Technical Skills Section

Think back to when you started Harrison Professional Pathways Program/NLU, how comfortable were you with your technical skills on the following questions?

18. I felt comfortable using discussion boards:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

19. I felt comfortable using chat rooms:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

20. I have successfully used chat rooms:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

21. I had a computer prior to entering Harrison Professional Pathways Program/NLU.

    ___Yes ___No ___Don't Know___Not comfortable answering

22. I felt comfortable working with files:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

23. I felt comfortable creating files:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

24. I felt comfortable saving files:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

25. I felt comfortable printing documents:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

26. I felt comfortable navigating multiple windows:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

27. I felt comfortable navigating multiple windows:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

28. I felt comfortable jumping between multiple screens and tabs prior to entering Harrison Professional Pathways Program/NLU:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree

1-Strongly Disagree

29. I felt comfortable researching topics online:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

30. I felt comfortable installing new browser software:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

Study Skills Section

Before you started Harrison Professional Pathways Program/NLU, how were regarding the following Study Skills

31. I could identify internet safety scams:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

32. I was able to read and understand college-level reading materials prior to entering Harrison Professional Pathways Program/NLU:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

33. Was able to prioritize studying in high school:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

34. How many hours per week did you study prior to entering Harrison Professional Pathways Program/NLU program_____

35. In the past I was usually getting help with school:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

36. I had a place at home that is free from distractions and can be claimed as "mine" for extended periods of study and communication time.
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

37. My friends and family are supportive of my decision to enter Harrison Professional Pathways Program/NLU:
    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

38. I had people and/or resources nearby which can assist me with any technical problems I might have with my software applications as well as my computer hardware prior to entering Harrison Professional Pathways Program/NLU:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

39. I could often complete difficult tasks on my own, even if others do not provide support and encouragement:

    5-Strongly Agree
    4-Agree
    3-Neutral
    2-Disagree
    1-Strongly Disagree

Section II Personal Grit

Before you started Harrison Professional Pathways Program/NLU how were you regarding the following Personal questions?

40. I had overcome setbacks to conquer an important challenge.
    5-Very much like me
    4-Mostly like me
    3-Somewhat like me
    2-Not much like me
    1-Not like me at all

41. New ideas and projects sometimes distracted me from previous ones.
    5-Very much like me
    4-Mostly like me
    3-Somewhat like me
    2-Not much like me
    1-Not like me at all

42. My interests change from year to year.
    5-Very much like me
    4-Mostly like me
    3-Somewhat like me
    2-Not much like me
    1-Not like me at all

43. Setbacks did not discourage me.
    5-Very much like me
    4-Mostly like me
    3-Somewhat like me
    2-Not much like me
    1-Not like me at all

44. I had been obsessed with a certain idea or project for a short time but later lost interest.

    5-Very much like me
    4-Mostly like me
    3-Somewhat like me
    2-Not much like me
    1-Not like me at all

45. I was a hard worker.

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

46. I use to set goals but later choose to pursue a different one.

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

47. I use to have difficulty maintaining my focus on projects that take more than a few months to complete.

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

48. I finished whatever I began.

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

49. I have achieved a goal that took years of work to complete.

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

50. I become interested in new pursuits every few months

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me

1-Not like me at all

51. I am diligent (careful and persistent work or effort)

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

52. How likely did you think you were to graduate

5-Very much like me
4-Mostly like me
3-Somewhat like me
2-Not much like me
1-Not like me at all

OPEN-ENDED

53. What's your GPA.

Appendix C-Interview Protocol Participants

1. Now that you are attending NLU/ Harrison Professional program, tell me the story of how you got here, including how you found out about these programs at NLU.
    a. Could you tell me more about that? What stands out in your mind about that?

2. How did National Louis help you transition to NLU/Harrison Professional Pathways program?

    a. What was one thing that stood out?

3. Tell me about what influenced your decision to go to college, and how you feel about it? If others were involved with making this decision tell me how?
    a. So what I hear you saying is…

4. Prior to entering NLU/Harrison Professional Pathways program did you take a computer class in high school? If so, was it in a classroom?
    a. Could you tell me more about that?

5. Have you took an online course i.e. Khan academy or digital component? If so, what was it?
    a. So what I hear you saying is…

6. How often was computer/internet used for assignments in school? Every day? Once a week? Once a month?
    a. What was one thing that stood out about using computer/internet?

7. Were you fearful of technology?
    a. If so, why?
    b. If not, why not?

8. Prior to entering NLU/ Harrison Professional Pathways program what was your level of awareness about using technology for school in your community?
    a. Can you give me example of using technology for school in your community?

9. What are some of the different places people can go to use technology and get assistance within your community?

    a. And what are some of the advantages and disadvantages of each?

10. If you were advising someone to get help using technology give me an example of how you would guide them toward different sorts of help
    a. What makes you feel that way?

11. Prior to entering NLU/Harrison Professional program describe your own personal experience with technology?
    a. What did you use technology for?

12. Did you have support services when needed?
    a. Were the services adequate on those occasions used?

13. Describe the support services you received?
    a. Can you give me an example of one support service?
    b. How would you improve those services?
    c. What would ideal services for you look like?

14. Did you feel comfortable discussing your situation during the time that led you to get help?
    a. If so, why?
    b. If not, why not

15. What could National Louis University have done prior to you entering NLU/Harrison Professional Pathway program to help you?
    a. What makes you feel this way?

16. What challenges did you overcome prior to entering college?

17. Did your H.S counselor provide you with information about the Universal College Application? Or the Common Application? (both allow you to create a centralized college application) if so, did you use both or ether one? If so, which one?

Appendix D-Interview Protocol Student Success Coach

I am going to ask you a series of questions about your role as Student Success Coach and ideas about your experience with Harrison Professional Pathway program. I want to remind you that this is for research purposes and the information you disclose is anonymous and confidential so please give us full and honest answers.

1. Can you tell me what is working well about Harrison Professional Pathways program?

2. Are students facing any challenges? If so, what are they related to? i.e. technology-based learning, etc.

3. What supports and or experiences do students need in the Harrison Professional Pathways program?

4. What supports and or experience do student success coach need in P3 program?

Appendix E-HP3 Director Approval

From: Stephanie Poczos
Sent: Thursday, March 17, 2016 7:09 AM
To: Tiffeny Jimenez
Subject: Re: Dissertation Project

Hi Tiffeny,

Sounds like Gloria is lucky to have you. Yes, she may collect data for IRRB. The term just ended and the next term starts April 4th. Does she need to secure a lunch hour for assessment like Karen did? If so, she could come in on that Tuesday. Can you set up the room and food? Food will be key! It seems to always get students to come!

Anything you need-I am here!
Steph

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Appendix F-Dean Approval

From: Judah Viola
Sent: Tuesday, March 15, 2016 10:13 AM
To: Tiffeny Jimenez
Subject: Re: Gloria Mullons - Dissertation Data Collection

I approve of her collecting data from undergraduates in CPSA as long as it is a voluntary process and signed consent forms are collected.

Good luck,
Judah

Appendix G-Operational Definitions used in the study

In order to have an understanding of the topic, it's important to define the terms showcased throughout the study by defining vocabulary and acronyms associated with the digital differences sector:

Definition 1. Technology Readiness-Having a basic set of skills in computer functionality, prior education, and work experience.

Definition 2. Grit- is defined as having determination to succeed despite obstacles and setbacks.

Definition 3. Demographics-Background information about the participants.

Definition 4. Interview Protocol for Participants-Phase II set of questions to understand student experiences with technology

Definition 5. Interview Protocol for Student Success Coach-Set of questions to understand how HP3 program is doing.

Definition 6. Digital Differences-While increased Internet adoption and the rise of mobile connectivity have reduced many gaps in technology access over the past decade, d=for some groups digital disparities still remain.

Definition 7. National School Lunch Program (NSLP)-Is a United States federal law that created the National School Lunch Program to provide low-cost or free school lunch meals to qualified students through subsidies to schools. The program was established as a way to prop up food prices by absorbing farm surpluses, while at the same time providing food to school age children.

Definition 8: Income Poverty-is when a family's income fails to meet a federally established threshold that differs across countries. Typically it is measured with respect to families and not the individual, and is adjusted for the number of persons in a family.

Definition 9: The **knowledge divide** is the gap in standards of living between those who can find, create, manage, process, and disseminate information or knowledge, and those who are impaired in this process.