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Understanding The Digital Lives Of Transnational Students: A Case Study

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UNDERSTANDING THE DIGITAL LIVES OF TRANSNATIONAL STUDENTS:

A CASE STUDY

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Dedication

I dedicate this to the Lord for being my direction, guidance, support and unfailing love in my life yesterday, today, tomorrow, and forever.

NA GOD!!

UNDERSTANDING THE DIGITAL LIVES OF TRANSNATIONAL STUDENTS: A CASE STUDY

by

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Abstract

The proliferation and the fast-paced evolution of digital information communication technologies (ICTs) in contemporary times have arguably raised concern for us to comprehend what we do with these technologies and what these technologies do for us. The experience of engaging these technologies may not necessarily be the same for everyone—especially students who come from around the world to attain post-graduate degrees in the United States. This research focused on understanding the digital lives, choices, and experiences of transnational students who navigate and negotiate geopolitical borders and boundaries (physical)– in their quest for education. Using a case study analysis and collecting data through a survey and a series of interviews, this interpretive empirical study made use of Actor-Network Theory (ANT). Specifically, I invoked Liza Pott's ANT mapping model, which she used as a way to further the interpretation and usage of the ANT model as a methodology and method of analyzing and understanding people's interaction and encounters with information communication technologies. Research Findings revealed that transnational students often used technologies that had a broad and far reach by users in both their countries of studies and their home countries. Also, transnational students preferred to use technologies that were user-centered design, and that did not have features and functions that distracted the users. The research emphasized that the design of technologies should place students, teachers, and academic professionals as primary users with interfaces, browsers, and other design features. Training, a core part in engaging technologies, should be implemented as a way to improve the use of technologies– It should be user-specific and based on an identified gap to improve the use and productivity. It is not solely the responsibility of either the industry or academy to ensure that transnational students integrate and navigate their new communities using

ICTs. It should be a joint and collaborative initiative to meet and match the needs of these groups of students with the use of technologies..

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Chapter 1: My ICT Story: An Unending Journey

This chapter sets–up the background of the study by addressing what motivated my interest in the research and what I intended to do in the study. Specifically, this chapter involves discussions and framing of the goal of the research study; the research design; the research setting; the purpose of the study; the research questions that guide the study; the conceptual framework of the study; the research methods and methodology; and as well as the significance of the study, assumptions, limitations, and delimitations of the study.

1.1 Where I am Coming From (Background)

During my secondary school days in Cameroon (from 1998–2004), we had a typewriting course that was required of all students. Although the typewriting classes were tedious, we only came to appreciate the value when computers came around–the keyboard layout of computers was significantly the same as the typewriting machines. I remember, vividly, that we had to take computer classes in Form Four (junior high school), but unfortunately, we actually used the computer about two semesters later; because of the fragile nature and prestigious value attached to computers, my school focused on ensuring that students had the necessary theoretical foundation even before powering on/off the computer set. The restriction of computer access only made my curiosity level grow as I kept pondering what that little "devil" can or cannot do. Watching TV ads about computers, the World Wide Web, and the Internet, I knew I had to go on a self–discovery adventure, rather than patiently wait for another two semesters. Fortunately, there were a few Internet Cybercafes that were set up in town, and my aunt (Quinta) was a worker at the store that

hosted a cafe. How can I ever forget the famous “Computer World” Cybercafe? I had to come up with reasons to visit her at the shop and to gaze at the computers and computer functioning.

I remember my aunt would always yell at me to stop touching the computer because any damage would mean a possible end to her job and even jail time if she could not afford to pay for a damaged computer. I often visited the Cybercafe after my school hours, and I learned a thing or two through self–discovery and adventures. Before I realized it, I was assisting the Cybercafe clients on using the Internet for communication and research purposes. I noticed that the practice of physically mailing pen pals had shifted to the electronic sector. I immediately created my first email address, Yahoo mail to be specific, and started communicating with random pen pals from different websites. The highest satisfaction I got out of that experience was that I could communicate with someone very far from my geographic location quickly–it was like magic. The next school semester was the period that I had to gain some practical computer experiences. I had an effortless time in class, and it was evident to my classmates and teacher that I was not new to the technology. I became like a second teacher and a point of reference in my practical computer classes. This was a massive motivation for me, and after graduating from high school, my love for world news pushed me toward my first professional career–a journalist.

It all started with listening to the BBC and watching world news on national television. I noticed that the news was mostly partially reported, or I could not grasp it by listening or watching once. So, I resorted to the Internet to get more details about the news. I became a news voice for my friends, family, and community–I was the middleman who brought the news to the people who, for one reason or the other, could not have direct access to the Internet. Soon, I was being called “Mr. Journalist.” I kept doing the research and dissemination of news and information by visiting the Cybercafes almost every day; it became my hobby. A few years later, the era of phones with

Internet access arrived, and I knew at the time that I had to change my plan of news hunting. The coming of the Internet did not change the basic design and functioning of phones; the phones were still operated using buttons, the colors were basic, and the Internet was slow (the realization of the smart era was still years ahead). Even so, it was pretty expensive to own a mobile phone with Internet access at the time. I volunteered with a radio station to work as a sports analyst and broadcaster. I think it was a smart move to keep up with the information age because, even though I still had access to the Cybercafes, the media station provided phones to its workers, and I was lucky to be part of the "breaking news" team. After working for a few years in the media and gaining capital to buy my mobile phone with Internet access, I decided to enroll in the university to read Journalism and Mass communication (In Cameroon, we would ask "What are you reading?" rather than "What are you studying?").

It was at the university that I discovered and experienced multiple forms of Information Communication Technologies (ICTs). Information Communication technologies include technologies that provide access to information through telecommunications. ICT is similar to Information Technology (IT) but different in that it primarily focuses on communication technologies (Christensson , 2010) . Some of the ICTs included paging, Internet texting and calling, faxing, printing, scanning, instant messengers, remote desktop access, and many others. In terms of research, whenever I had doubts about specific terms or concepts, Wikipedia was always a go–to place to double–check my concerns. While most Cameroonians, at the time, used the Cybercafe to access the World Wide Web and the Internet, some people, including myself, preferred to use a mobile phone to access the Internet rather than the computers at the Cybercafes. Part of the reason was that of slow Internet speed and connectivity at the Cybercafes. The Cybercafe's broadband was not strong enough to handle many people accessing the Internet at the

time, and they usually closed at about 9:00 pm. In Cameroon, the Internet is fastest after 10:00 pm, and thus, most people buy phone data to access the Internet using their phones at night when the speed was reasonably fast because they did not have to share the broadband with anyone. In fact, I used my smartphone to complete a significant portion of online application forms for graduate school in the United States. I also used it to send and receive an email from my future faculty members in the university in the USA. This became a significant medium of engaging ICT—both in formal and informal contexts—such as communication in school, with friends, and as well as with family.

In 2013, when I came to the USA, I bought a Windows laptop for graduate school because that was what I used back home. Also, I could afford it (it cost $300), and the software applications were easy to access, navigate, and manipulate. The Windows laptop was a familiar device, and I did not need any specialized training to operate it. Unlike the Windows laptop, I was not familiar with using a Mac laptop, and it was expensive and above my budget (at the time, it cost approximately $800). After a couple of years in graduate school and engaging with Mac laptops/ desktop, I found myself becoming comfortable with using Mac computers as my major form of engaging ICTs. This was mainly through the Mac computers in classrooms/libraries. I later switched from owning a windows laptop to owning a Mac laptop. One of the major reasons was because of the frustrations I had with the reliability and durability of the windows laptop (I bought 3 windows laptops within 2 years–machine breakdowns and system failures, while my Mac laptop has lasted for over 24 months and counting).

Before I left Cameroon, I communicated with my family and friends via phone calls and short message service (SMS) and sometimes using social media (friends only). When I came to the USA, I had to negotiate my use of different ICTs depending on cultural, economic, political,

and social factors. Cost and affordability play a significant role in my ICT choices. For example, my cultural background influences the forms and types of ICT choices I engage in communicating with my family, friends, and colleagues back home–I mostly use common, economical and easy to use apps like WhatsApp, IMO, Facebook Messenger because of accessibility and affordability. I can either send them instant messages or call them through the applications. I cannot remember the last time I made a regular phone call to my family or friends back home.

Furthermore, because I am in the USA, my family, friends, and colleagues have been "forced" to adapt and adjust to the ICTs that we use in communicating (the adaptation and adjustments are on both ends). This is not necessarily the case with family, friends, and colleagues residing in the USA. Because of their cultural background and technological exposure, I tend to use regular phone calls, emailing, or SMS because of the practices involved with communicating in these contexts. Besides economic conditions, socio–cultural factors also significantly influence our ICT choices.

Reliability, affordability, and usability are contextually based on our needs and cultural exposure–and although we can identify with particular cultures or cultural backgrounds in terms of our ICT choices, the final decision will heavily depend on individual decisions, needs, and experiences. My ICT choices were based on availability, affordability, and accessibility, which I coin as the 3As of ICTs. And, the decision about which ICT to engage with also varied with context, needs, and exigency of communication. My narrative, I believe, is essential because not everyone uses and experiences ICTs in the same way, and researchers may overlook essential factors that influence and inform our ICT choices and use. In other words, I argue that the decisions concerning our ICT choices are significantly informed by individual experiences and needs, and

the fluid cultural practices of a particular geographical location and a particular period. These cultural practices influence our daily interactions and negotiations of these ICTs.

1.2 Where I Intend To Go (Statement of Purpose)

The proliferation and the fast–paced evolution of digital information communication technologies (ICTs) in contemporary times have arguably raised concern for us to comprehend what we do with these technologies and what these technologies do for us. In other words, we need to understand the digital lives, choices, and experiences of people who engage these technologies, whether software and hardware, in one way or the other, or even multiple ways. I believe it is important to understand these different digital lives, choices, and experiences for the following reasons:

- It will help academic institutions and technology industries design and tailor technologies to match the different needs and wants of different user populations.
- It will help reduce, if not wholly eliminate, the essentialist views of technology being universal in terms of its accessibility, affordability, and application.
- Besides creating an enabling space/environment to match/meet the needs of different audiences, understanding the digital lives, choices, and experiences of users is critically important.
- We need to understand the lifeworlds of technology users in order to create a sense of morality in designing, developing, and production of different technologies. Even though capitalism is the economic system in place in the USA, I still think industry and institutions can design and develop and engage technologies that cater to the needs of the users and not just the money. Thus, that is why User Experience(UX) and

Usability studies are emerging. They have always been around like a sleeping giant, but they are now awakening.

- Also, it is important for the success and long–term growth/survival of the technology industry as well as institutions that engage these technologies.

I want to make clear that I am in no way implying that research on a particular group of users will inform the needs of anyone that identifies with that group, no. As research is a continuous process and things/people/environments change over time, so too are the needs/expectations of different users in different contexts. Thus, to make this even more explicit, I invoke Huatong Sun's position on culture and cultural localization. Sun (2012) constructed culture as "the meanings, behaviors, and practices that groups of people develop and share over time as well as the tangible manifestations of a way of life, such as artifacts, values, and states of consciousness" (Geertz, 1973) while cultural localization or local cultures "includes broad sociocultural factors from national/ethnic culture (e.g., collectivism vs. individualism, universalist vs. particularist orientations) and subgroup culture (e.g., age group, gender, and organizational affiliation), individual factors (e.g., personal background, values, and interests), ways of life, daily activities, and interpretations of these" (Sun, 2012, p. 5). I lean towards Sun's position as our culture and cultural practices influence and are influenced by our ICTs choices and experiences. In other words, the local cultures and cultural practices of transnational students, such as myself, can form important actants in the Actor Network Theory analysis I demonstrated in this dissertation.

My experiences as a transnational student, with engaging ICTs, inspired me to research this topic in Rhetoric and Composition studies. I employ a case study approach with three graduate students who met this study's definition of transnational students as they experience a double reality in the quest for education in another country: an imagined versus lived reality. I chose to

conduct a study WITH transnational graduate students because very little has been said or addressed on this particular population with regards to their ICT lives–transnational students constitute a significant part of graduate students in USA colleges, and it is inevitable to start understanding their digital lifeworlds, so to speak. Thus, the purpose of this study is to understand the digital lives, choices, and experiences of transnational students who navigate and negotiate geopolitical borders and boundaries (physical)– in their quest for education. The aim is not only to account for the transnational perspectives of the students themselves, and the complex processes of globalization, but also to understand the different types of digital technologies (hardware and software) they use or do not use, and the reasons for their choices in the bifocal worlds–in both their academic and non–academic lives. This project, I hope, will help researchers, scholars and even industry to understand the different ICT choices and digital practices of transnational students bifocal realities and also the rationale behind those choices in their digital literate lives.

1.3 Methodology and Methods

1.3.1 Theoretical and Methodological Framework

The research method used in any study lays the roadmap on how to go about finding, analyzing, and interpreting information–based on the research questions. The case study will involve three transnational students' use of information communication technologies (both in the academy and outside the academy) in their quest for education at a particular university in the USA. Using a case study analysis, this interpretive empirical study made use of Actor–Network Theory (ANT). Specifically, I invoked Liza Pott's model of ANT mapping, which she used as a way to further the interpretation and usage of the ANT model as a methodology and method of analyzing and understanding people's interaction and encounters with information communication technologies.

1.3.2 Actor–Network Theory

The theoretical and methodological concept/approach of Actor–Network Theory was developed by science and technology scholars (Bruno Latour,1996; John Law, 1992) and as well as a sociology scholar (Michel Callon, 1986). The theoretical and methodological application of ANT has evolved and has also been adapted to multiple situations over time. Arguably, we can almost always apply ANT to any context that involves both human and non–human technological agency. Let me backtrack to the etymological conceptualization of ANT as pioneered by Latour, Law, and Callon. With the hope of disrupting the current sociological theories of the time, Latour proposed, what Liza Potts (2008) considered as "radical," the idea that agency was equally distributed amongst humans and non–humans. In other words, there exists equal agency distribution between people and technology. Thus, Latour (2005) suggests that we examine human and non–human actors equally and should not give any of them priority. Technology and people should then be regarded as equal agents of action (Potts 2008). The actors are the participants in the network of relations and thus include the people and the technologies. Humans are considered the eminent actors who own and control their actions and environments more so than the technologies that surround them, but, as Latour argues, humans and non–humans possess the same degree of agency.

These actors, as Latour (1987) posits, can come together to form temporary networks, can create assemblages of relations specific to an individual act or a broader event and can form a collective network (actant) of relationships in a social situation that is led by a spokesperson. Potts (2009) considers an actant as a network comprising any actors—cell phones, blogs, people, that *can* act and *do* act within the network. This means that all the factors in a social situation are then considered to be on the same level. There are no external factors beyond what and how the

participants, in a social network, interact at present. Echoing this position, ideas, objects, processes, and other factors that transact people and technologies are considered just as important in creating social situations as are humans. Thus, as social forces do not exist in themselves, they cannot be used to explain social phenomena, but, rather, ANT encourages us to engage in empirical analysis to describe a social activity. ANT seeks to understand the social relations between people and technologies through empirical research, where the researcher describes the experiences of the participants rather than explain the relationships. Just as I mentioned in a few paragraphs above, there have been scholars who have adapted ANT and used it in different contexts.

In her 2008 article, "Diagramming With Actor Network Theory: A Method Of Modeling Holistic Experience," Potts used the London bombings of 2005, as an example of how ANT can be used as a way to suggest what software designers and developers should consider in their design and development process by considering the holistic experience of the social context. According to the BBC news report, in the morning hours of July 7, 2005, suicide bombers attacked the London transport system killing over 52 and injuring more than 770 persons. As reported, many of the commuters used communication devices to record and document the event. These communication devices ranged from cell phones to laptops that they usually engaged within their regular business day (BBC News, 2005). Potts used the London bombings of 2005 as an example in mapping the connections and relations of humans and non–humans at different stages of describing the aftermath experiences.

Using the London bombing as a way to illustrate disaster communication, Potts postulates that "disaster communication provides an opportunity to rethink the design of software, given that it shows how people make do with the tools they are given– cell phones, blogs, media, sharing sites, wikis, news articles, etc." (Potts, 2008, p. 1). I add to this by invoking the same concept in

the case of transnational students. I believe that ANT diagramming can be used as a method to understand and rethink the design and enforcement of the different technologies that transnational students use or do not use in the form of hardware (cell phones, laptops, tablets, desktops, etc.) and software/applications (blogs, wikis, chats, texts, etc.). I intentionally used the word "enforcement" because some of the technologies are situated and located in spaces that call for an unequivocal acceptance to use by arguably many students. For example, a classroom equipped with Mac computers may "politely" request students to engage those technologies in their epistemological journey, simply by making them available in that classroom. In as much as we may argue that we give students options, I strongly think that students are left with little or no option in terms of engaging those technologies. Without deviating too much, let me return to the ANT diagramming method.

This method significantly helps us in opening the technological "black boxes" of transnational students, as well as understanding their experiences in engaging these technologies both inside the academy and outside the academy. To do this, I invoked Latour's position on understanding the social phenomenon as a model of understanding the experiences of these students in engaging different technologies in their bifocal lifeworlds. Latour (2005) posits that in order to explain a social phenomenon, we need to engage strict empirical analysis to "describe" rather than "explain" social activity. This, I believe, is productive when we implement the ANT principle of letting the users describe their experiences rather than researchers explaining and interpreting them.

Re–imagining ANT as Actor–Network Theory mapping, Potts used three stages of mapping to describe and make meaning in the relations between the humans (people) and non–humans (technologies, materials, objects). I engaged Pott's conceptualization of ANT mapping as

a method of diagramming and understanding the experiences of transnational students' use of technologies in the quest for higher education. The three stages of the ANT mapping included: identifying the actor networks, identifying the people, places, and things; and identifying the temporary relationships that exist with the actors.

a) Identifying The Actor Networks:

According to Potts, by taking into consideration all of the actors participating in a system, the researcher or designer–using mapping–will be better informed and able to create communication tools that can support holistic experiences across systems. In the figure below, Potts places Adam Stacey at the center of the Actor–Network diagram. Adam Stacey was at the location of the bombing, and he also took pictures of the bombing event while escaping the scene. Here, Stacey's image is at the center of the map because of the image he took of the people who were "trapped in the tube" in the bombings. The image circulated to/through different media and places using different technological devices/ medium–from personal bloggers to mainstream media. Without this image, the other actors in the network would not have engaged in any form of agency because they would not have been any central actant. Agency is equally shared in ANT, but there must be a central actant in the network. Thus, Stacey's uploaded image becomes the central actant that ignites the relations with the other human and non–human actors in the diagram

.

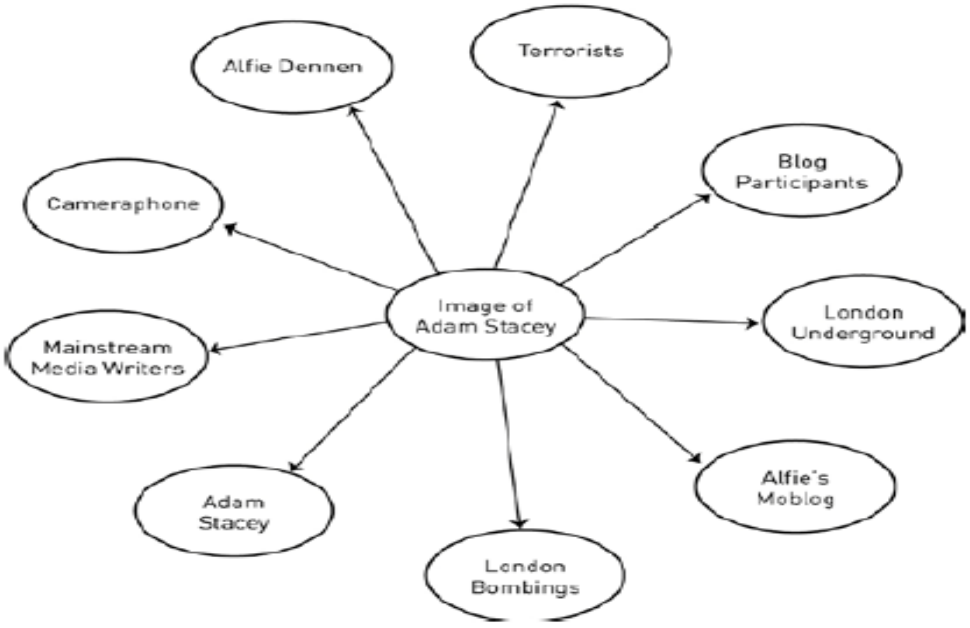

Figure 1.1: ANT diagram in relation to Adam Stacey's uploaded image of his escape from the bomb scene.

Potts uses the ANT diagram to map out the different human and non–human technological participants involved in coordinating the information of the London bombings. These participants ranged from news outlets, cameraphones, Adam Stacey, Alfie Dennen (the owner of the moblog that first posted this image), and terrorists to other actors who help in distributing/circulating the image to check on Stacey's wellbeing as well as other victims of the bombings. Potts (2008) argues that "these basic diagrams [as we see in figure 1] are illuminating in that they begin to map out the available people, places, and things that participants may encounter in a given system" (p. 3). This, I think, also applies to transnational students' experiences across systems of communication and technological networks. Using similar conceptualization, in this following chapter, I identify and map the transnational students' (research participants) experiences with the use of technologies, the places they engaged these technologies, and the different things that they encounter in their interaction with the different technological systems in the bifocal lives.

b) Identifying The People, Places, And Things:

To begin understanding the context in which participants use these communication systems, Potts (2008) stated that designers must first understand who and what is involved in these scenarios. Thus, the next step in this analysis is to identify the people, places, and things involved. Cataloging the people, places, and things that are active participants in this Actor–Network can help developers of these social software sites to begin to understand what sort of structures must be in place to allow for the mediation of information across these systems. In figure 1.2, Potts used this ANT diagram to catalog the different actors in the London bombings as a way to identify the different active actants in the network. With the use of different (but identifiable or coded) shapes, Potts put forward that this visualization is important because it creates a visual aid for different users and audiences to map the Actor–Network. Thus, we need to create different shapes for the human and non–human active actants. In the case of the London bombings, we can see different shapes to visually indicate the person, groups, place, system, technology, and event spreading out of the main actant–in this case, the object or the image of Stacey Adams.

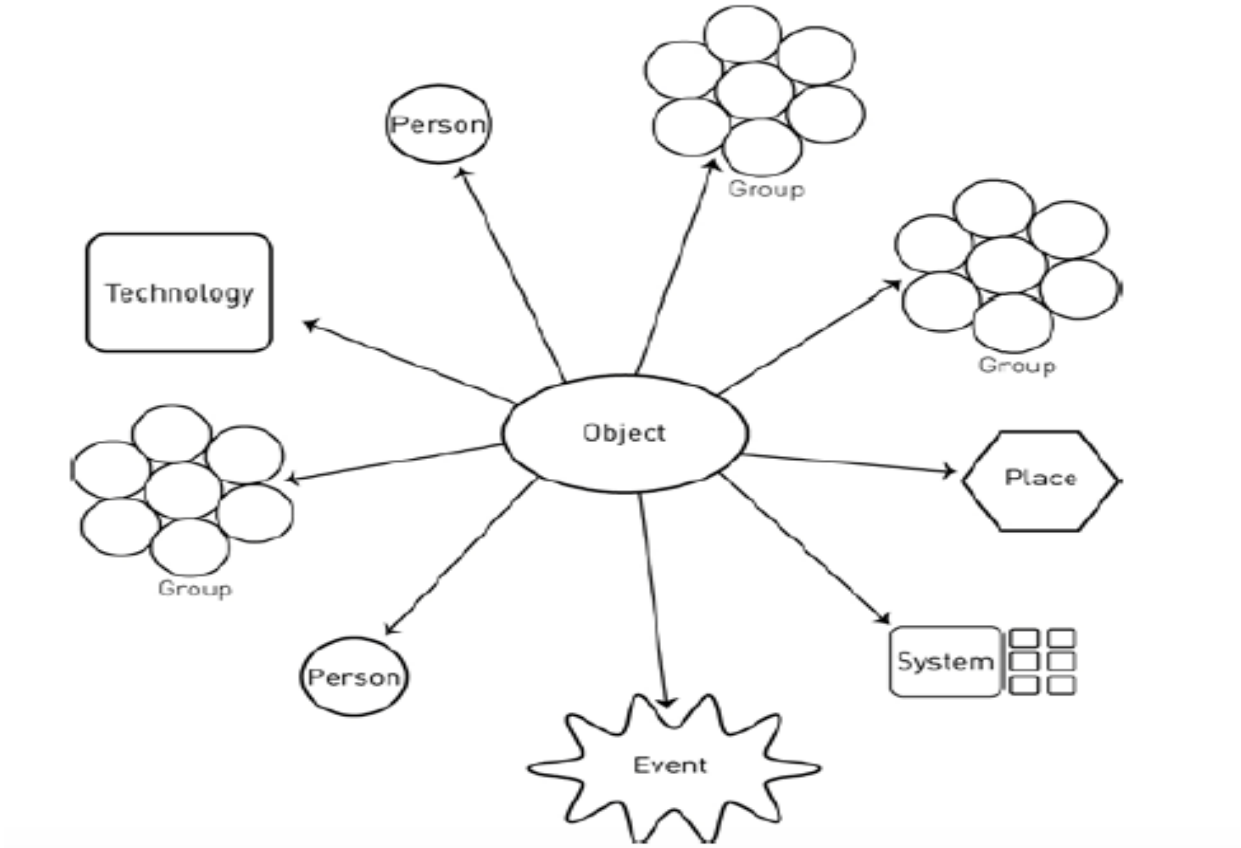

Figure 1.2: Adding relevant shapes to ANT diagrams.

Potts (2008) states, “creating a set of relevant objects for these nouns is a helpful visual cue, aiding developers and designers in building these diagrams” (p. 5). Thus, creating a set of relevant technological and environmental objects will help us understand the different experiences of transnational students with their use of technology both in the academy and outside the academy. The objects help us interpret and understand their different experiences with different objects or material things. Thus, through cataloging, both the academy and industry can understand the different structures that transnational students require or must be in place for the mediation of communication technology information across systems.

c) Identifying The Temporary Relationships That Exist With The Actors:

The concept of temporary relationships is the final key element in this diagramming methodology. According to Potts, the resulting diagram is based on the notion of tracing temporary connections and accepting how people join and leave communities as necessary to complete tasks; tracing these connections across wide ecosystems of people and technologies to understand all of the major variables affecting these events and people; and embedding designers within communities of practice so that they are participants who can then design for the scenarios in which they are involved (p. 5).

In figure 1.3, Potts illustrates the different temporal relationships that were created as a result of the initial posting of Stacey's image. There were established groups of people already existing before the bombings, but as a result of the circulation of the image, different temporal relationships were created, and different participants enter the network of relationships as a result. Looking closely at the different relationship lines (some bolded, dotted, and others thin and thick or a combination), we can see the different kinds of relationships that were created by the different human and non–human actants–with the image of Stacey Adam being the central actant.

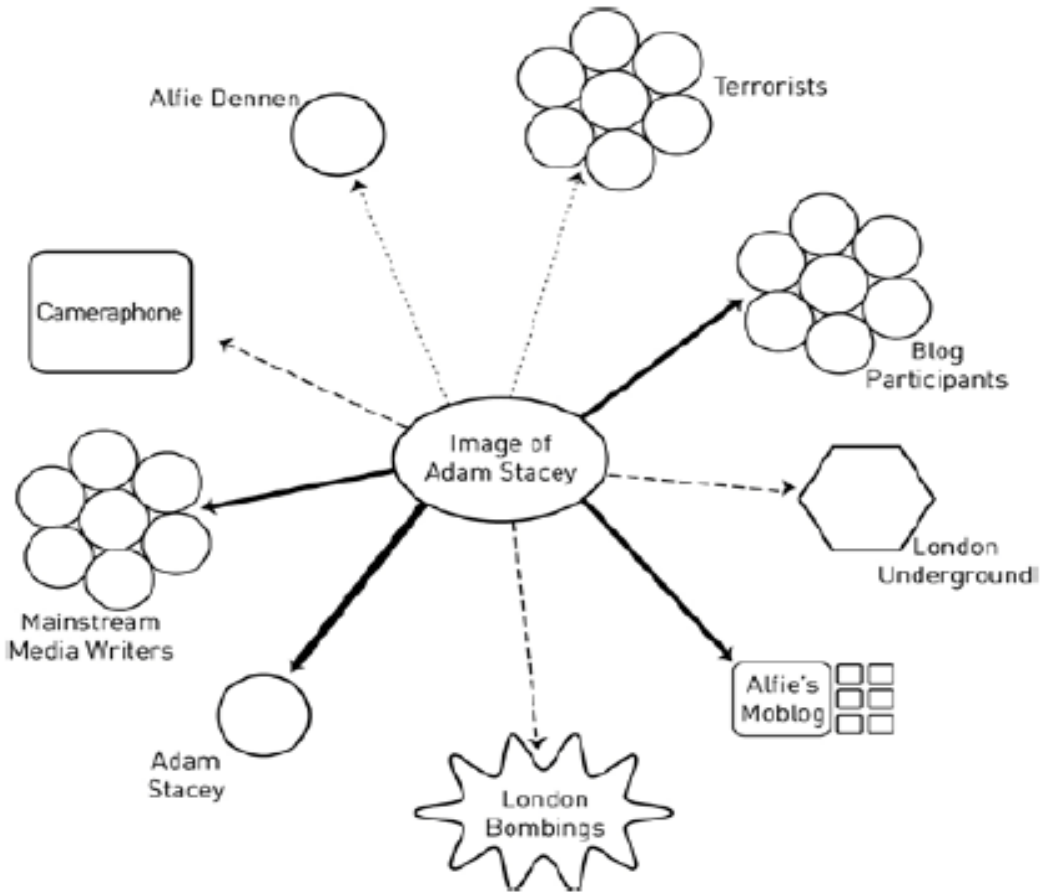

Figure 1.3: ANT Diagram of the actors' temporal relationships to Adam Stacey 's uploaded image of his escape from the bomb scene.

Potts postulates that "mapping out these nouns helps to create a common understanding of the available people, organizations, technologies, and locations in which people are active participants within these mediated systems" (p. 5). This was used in understanding the experiences of transnational students with mapping out the different technologies and technological objects/tools/materials they actively encounter in the academy and outside the academy. It indicated how transnational students' relationships (temporal) with technologies were formed by joining and leaving different technological communities through usage and non–usage**.**

As Potts posits that ANT can be used to engage developers by showing them a broader view of the entire network of actors involved in these experiences, ANT was used as a methodological tool in understanding the experiences of different persons, groups of persons or non–human actants, with the use of information communication technologies. Just as Potts stated in her conclusion of the study, the diagramming system can also be applied to the design of any system that needs to take into consideration the many technologies, people, and organizations involved in any workflow process. In this case, ANT was applied to transnational students' use of ICT in a USA college setting, in their pursuit of higher education.

1.4 Methods

1.4.1 Research Context

This empirical research was conducted at a public higher institution in the USA–specifically The University of Texas at El Paso. The Carnegie classified R1, or very high research activity, institution has a majority–minority student population and a significant representation of transnational students from around the world. A transnational person is any person or persons who negotiate, mediate, experience, move, relocate, and transcend national and international geopolitical boundaries and borders, either physically or physically and virtually, and whether willingly or unwillingly. The research for this dissertation specifically focused on transnational students. The aim was to understand the experiences of these transnational students' engagement with ICTs in both their academic and non–academic life and the different literacy practices they engaged in the quest for higher education. The research population was intentionally made up of transnational students who had similar academic interests in terms of their area of studies or degree option. They were all Ph.D. students in the Rhetoric and Writing program. The research described

and made meaning, using ANT mapping by Liza Potts, of the temporal relationships created by the students' interaction with different ICTs–hardware and software–people, places, and things in navigating their bifocal realities as graduate students and graduate teaching assistants at the university. As a way to unpack the relationships and understand these transnational students' experiences with ICTs, and with the unending proliferation of new communication technologies, the research aimed at addressing the following questions:

1. How and for what purposes do transnational students negotiate new ICT literacy or multiliteracies practices and events in their bifocal realities?
2. What influences the ICT choices of transnational students in their bifocal realities?
3. How can transnational students' digital literate practices impact the mainstream beliefs of ICT choices and uses in different contexts?
4. How can transnational students' literate practices and experiences influence the ways technology industries design and develop ICTs in a globalized society?

1.4.2 Research Design and Setting

This study intended to understand the ICT practices of transnational students in a particular higher institution in El Paso, Texas. As Beverly Moss (1992) emphasized in her ethnographic language study that we need to spend time with people to understand them, the idea is important here as we need to understand, deeply, how transnational students' ICT practices and values unfold in their bifocal realities. This study was influenced by *the transnational literate lives in digital times project*, conducted by Patrick Berry, Gail Hawisher, and Cynthia Selfe (2012). Just like their study, this study was grounded in oral–history and life history narratives and research (Bertaux, 1981; Bertaux & Thompson, 1993, 1997; Thompson, 1988; Lummis, 1987). The scope

of the narratives was significantly tailored towards understanding their ICT practices in their bifocal world. Anthony Giddens (1979, 1984), Michel de Certeau (1984), and Ernesto Laclau and Chantal Mouffe (1985), posit that human agents both shape and are shaped the forces they inhabit in different contexts such as cultural forces, educational forces, economic forces, and social forces.

1.4.3 Research Participants

Selection Criteria

The selection of the participants for this study was based on purposive random sampling (Miles & Huberman, 1994; Patton, 1990). According to Ashley Crossman (2018), a purposive sample is a non–probability sample that is selected based on the characteristics of a population and the objective of the study. Specifically, I used a typical case sampling approach to study the ICT practice phenomenon of transnational graduate students in a particular higher institution in the USA. Thus, the main criteria I used in selecting the participants were as follows: a) being a transnational student currently enrolled at the studied institution for one semester or more and b) being a graduate student who had spent at least one academic year at the institution.

Recruitment Procedure

The recruitment of the participants was done through a survey. In the survey, I clearly explained the study overview to the prospective participants. I also ensured that they knew that their acceptance to be part of the project was voluntary, and there was no penalty or punishment for refusing to be part of the study. After the survey was conducted, I selected three participants based on their responses and how it matched the population for the study. The final subjects for the study were recruited through direct contact (via email and phone calls/messages). I also

provided more details about the aim of the study, the goals of the study, the objectives of the study, what was involved in the study, the risks and discomforts involved in the study, and the benefits of being part of the study. The subjects then decided to be part of the study based on the above explanations and information provided. I also let them know that the recruitment was voluntary and that they had the right to withdraw, or I could withdraw them from the study at any time, and they were not going to be penalized or lose any benefit if a withdrawal happened during the research.

1.5 Data Collection

1.5.1 Survey

In research, surveys usually act as the first instrument used in recruiting and collecting preliminary information about research participants or future research participants. I used a survey in this research to collect preliminary background information about the research participants. The information shared by the participants included information such as their names, age range, country of origin, the languages[1] they use in navigating their academic and non–academic lives, different ICTs they used, the program of studies, and years they have spent at the institution–to list a few. The survey was designed using an online survey tool provided by the institution, and the participants could respond to the survey using any digital device that had access to the internet and applications that could run the survey program. I used the institution's Qualtrics survey instrument in conducting the research survey.

It should be noted that there was a consent form attached to the survey to enable the participants to provide consent to be part of the research and thus, fulfilling the ethical obligation

[1] Language diversity is tied to technology use but in this study, I focused only on identifying the different languages the participants used.

of recruiting and collecting information from research subjects. I placed the consent form at the beginning of the survey. There were 24 questions in the survey, including a question that requested the participants to provide contact information for follow up interviews–the contact information was their email addresses.

1.5.2 Interview

Using the criteria mentioned above, I reviewed the survey data and selected three interview participants. They agreed to be interviewed for the study. The data for this study was collected through a series of interviews with transnational students. I conducted five individual face–to–face and Skype oral interviews. I conducted five interviews with each interview section containing over five open ended questions. The interview was structured as a conversation style interview and I asked follow up questions based on the responses of the participants. The interview questions were the same for all the participants. The interview data recording involved the use of audio recordings using a cell phone and an iPad. Because this study involved recordings from human subjects, I ensured that I strictly adhered to keeping their identities confidential. I asked them if they wish to be identified or to remain anonymous in my analysis, presentation, and publication of the data I got from them during the study. Whatever option each participant decided to go with, I strictly respected that. Also, the data gathered through the interview was kept confidential, and I am the only person who has access and uses the data.

1.6 Coding

After collecting and transcribing data from a study, the next stages of the research process involved making sense of the data. The sense–making process has many stages, and the first often involves coding the data. Data coding does not happen in a vacuum as there must be a theory, method, or methodology that informs the process. Kathy Charmaz (2006) defines coding as a

means of categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data (p. 43). The codes show how we select, separate, and sort data to begin an analytic accounting of them. This is a qualitative research study, and thus, qualitative coding–defining what the data are about –was used in coding the data (Charmaz, 2006, p. 43).

In this study, I adopted the grounded theory method in coding the data. Charmaz considers grounded theory as a set of principles and practices and not as prescriptions or packages (p. 9). Thus, the grounded theory method can complement other approaches to qualitative data analysis rather than stand as opposed to them. Although the grounded theory is not the methodology that informed my study, I used it as a guiding principle in coding the data from the interviews. Charmaz (2006) posits that grounded theory coding generates the bones of analysis as it shapes the analytical frame from which you build your analysis (p. 45). There are different phases involved in shaping the analytical frame.

According to Charmaz (2006), there are two phases in grounded theory coding: 1) an initial phase involving naming each word, line, or segment of data followed by 2) a focused, selective phase that uses the most significant or frequent initial codes to sort, synthesize, integrate, and organize large amounts of data (p. 46). These two phases involve different strategies. In this study, I used three grounded theory strategies in coding the data. After coding the data, I identified different patterns of technology usage and the different technologies that the participants engaged in. It was from the data of these patterns and the different ICTs that I mapped the experiences of these participants using the ANT diagramming concept proposed by Liza Potts (2008). In other words, the coding was a foundation for me to visually represent the experiences of the participants on the diagrams. The strategies included line–by–line coding, focused coding, and in–vivo coding.

1.6.1 Line–By–Line Coding:

Charmaz (2006) states that grounded theorists often consider line–by–line coding as the first step in coding, and it forces the researcher to look at the data anew (p. 50–51). This involves naming each line in your data (Glacer, 1978). A benefit of using line–by–line coding is that it prompts the researcher to remain open to the data and to see nuances in it. Another benefit is that it also helps the researcher identify implicit concerns as well as explicit statements (Charmaz, 2006, p.50). Charmaz identified some flexible strategies that can help a researcher code using line–by–line coding. They include: breaking the data up into their parts or properties; defining the actions on which they rest; looking for tacit assumptions; explicating implicit actions and meanings; crystallizing the significance of the points; comparing data with data; and identifying gaps in the data (2006, p. 50). Charmaz provided some guiding questions involved in line–by–line coding that help you see actions and identify important processes in the data include:

- What process(es) is at issue here? How can I define it?
- How does this process develop?
- How does the research participant(s) act while involved in this process?
- What does the research participant(s) profess to think and feel while
- involved in this process? What might his or her observed behavior indicate?
- When, why, and how does the process change?
- What are the consequences of the process?

1.6.2 Focused Coding

The second major phase in grounded theory coding is focused coding. It means using the most significant and/or frequent earlier codes to sift through large amounts of data (Charmaz,

2006). In focused coding, the codes are more directed, selective, and conceptual than word–by–word, line–by–line, and incident–by–incident coding (Glaser, 1978). Focused coding helps the researcher synthesized and explain larger segments of data that have been established the line–by–line coding, and it requires decisions about which initial codes make the most analytic sense to categorize your data incisively and completely (Charmaz, 2006, p. 57).

1.6.3 In Vivo Coding

According to Charmaz (2006), in vivo coding involves coding special terms that are used by research participants during the data gathering process. It provides a useful analytic point of departure and helps the researcher preserve participants' meanings of their views and actions in the coding process. In vivo codes needs to be integrated into a theory to make it useful and three kinds of in vivo codes prove to be useful:

- Those general terms everyone “knows” that flag condensed but significant meanings
- A participant's innovative term that captures meanings or experience
- Insider shorthand terms specific to a particular group that reflect their perspective.

Thus, when using in vivo codes, we look for their implicit meanings and attend to how they construct and act upon these meanings (Charmaz, 2006, p. 55).

1.7 Categorization

1.7.1 ANT Mapping

Liza Potts (2008) put forward three stages to incorporate when engaging ANT mapping to describe and make meaning in the relations between humans and non–humans. The three stages include:

- Identifying the actor network
- Identifying people, places and things

- Identifying the temporary relationship

1. Identifying the actor network:

At this stage, the researcher, using mapping, takes into consideration all the actors participating in a system. As Potts (2008) argues, the diagrams are illuminating as they begin to map out the available people, places, and things that participants may encounter in a given system. In this study, after coding, I mapped out the actor–network theory by considering all the participants, the different places, and different ICTs they engaged in their bifocal realities in their pursuit of higher education in a USA college. The actor–network map represents all the actors of the three participants in the research. I used a single actor–network map in this context because all three participants engage these different ICTs with a common goal for higher education in the same institution and the same academic program.

Even though agency is equally shared in ANT, there must be a central actant that ignites the relations with other human and non–human actors. In this diagram, I used the "image of participant" because the participants are the central actants that ignite the relations with the different ICTs, people, and places in the system.

2. Identifying the people, places and things:

Potts states that we must identify who and what is involved in the ANT network in order to understand the context in which participants use a communication system. In this research, the people constitute the participants and other persons that each participant engaged in communication with–whether ate the institutional level, family level, job level, or friends level. The places involved the different physical and virtual environments that the communication took place and the things involved the objects–ICTs-– whether it being hardware or software used by

the participants in engaging communication in both their academic and non–academic life. I purposefully did not provide a map for this stage. However, I want to highlight the fact that I used commonly identifiable icons to represent the different people, places, and things. Although I consider these icons to be easy to identify, I still provided labels to ensure clarity and easy comprehension by the audience.

3. Identifying the temporary relationships that exist with the actors:

After identifying the actor network and the people, places, and things in that network, the final stage is to identify the temporary relationships that exist with the actors. This stage is crucial as it unpacks the temporary relationships- –through mapping– that exist between the different actors. In this research, in order to identify the temporary relationship that forms as a result the research participants engaging ICTS, I identified five categories and used them to unpack the different relationships. They include:

- ***ICT and academic use:*** involves the participants' experiences with engaging ICTs in an academic context.
- ***ICT and family:*** involves the participants' experiences with engaging ICTs in communicating with family.
- ***ICT and friends:*** involves the participants' experiences with engaging ICT in communicating with friends.
- ***ICT and job:*** involves the participants' experiences with engaging ICTs at their job site.
- ***ICT and other social interactions*:** involves the participants' experiences with engaging ICTs in their interactions in a social context other than friends, family and even a job site.

1.7.2 Mapping and Frequency Categorization

Latour (2005) argues that in order to explain a social phenomenon, we need to engage strict empirical analysis to "describe" rather than "explain" social activity. Implementing this ANT principle and using the maps to describe the experiences of the participants, I used the different frequency–of-–use categories (identified by different mapping lines) to describe participants' engagement of different ICTs. Even though the frequency categorization may be considered as "explaining" the experiences of the participants, I consider it a description as the participants wrote their chapters with me and verified and validated the accuracy of the text as it accurately represented the description of their experiences. Each participant had a chapter dedicated to their shared experiences via narratives. The different frequency categories and corresponding include:

- **Very frequently:** the participants engages ICTs and related actants very often
- **Frequently:** the participants engages ICTs and related actants often or regularly
- **Occasionally**: the participants engages ICTs and related actants irregularly or sometimes
- **Rarely**: the participants engages ICTs and related actants not very often
- **Very rarely:** the participants almost never engages ICTs and related actants
- **Never:** the participants do not engage ICTs and related actants.

1.7.3 Mapping Key and Lines

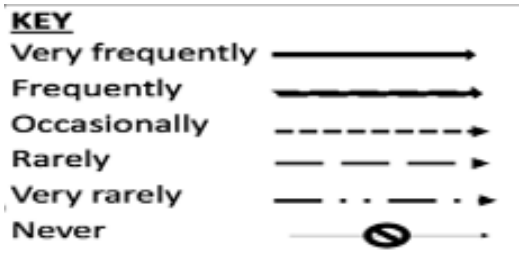

Figure 1.5: Mapping key

1.8 Data Analysis

The analyses of the data was conducted using qualitative interpretive methods such as textual analysis (to ensure a better and close understanding of the narratives), triangulation (to ensure that the narratives are rich, robust, comprehensive and well–developed), and thick descriptions (to ensure understanding of the practices and the contexts of such practices) of the oral and life history narratives shared by the participants via interviews. A core part of my data analysis and interpretation involved the use of visuals. Specifically, I used diagrammatic maps and other visual representations to identify, explore, interpret and understand different networks, connections, and relationships that exist between/with different transnational students and different ICTs in their quest for higher education.

1.8.1 Data Validity

The validity of the results was tested using the following strategies put forward by Cresswell & Miller (2000):

a) ***Member Checking:***

To determine the accuracy of the qualitative findings by taking the final report or specific descriptions or themes back to participants and determining whether these participants feel that their thoughts are accurately and fairly represented. With this, I researched and wrote with the participants and not just about them. In other words, I fully engaged the participants in the research process from data collection, data verification, data analysis, and even the writing of the findings from the analysis. At every stage of the research, I communicated with the participants and allowed them to review, edit, and add information that they believe conveys their experiences with using

ICTs. In as much as I was writing with participants, I had specific protocols to keep my authority as the principal researcher.

The participants could only review, edit, and revise information chapters or sections that pertained to their individual shared narratives. The participants were asked to track their changes so that I could review them before accepting anything they added or changed to the chapters shared with them. I also sent follow–up questions to clarify some of their positions in order not to misrepresent their ideas and thoughts. They were not involved in designing the theories, concepts, methods, or methodology that informed the research. Also, they had the opportunity to read the other chapters but not the privilege to review, edit, or revise them.

b) Thick Description:

To convey the findings, which may transport readers to the setting and give the discussion an element of shared experiences. With this, I looked beyond the data by placing the meaning–making and interpretations on the cultural framework and meanings of the actors, their codes of signification, providing an emic account grounded in the participants' cultural context (Clifford Geetz, 1973). Thus, I researched and wrote with the participants. This, I believed, cultural context is negotiated with a member of that space by entering into that space and not by analyzing from outside. Although I could never be an insider, I negotiated to understand what goes on in the space by researching with the participants.

Chapter 2: ICTs, Transnational Students and Transnational Literacies

In this chapter, I reviewed existing literature that addressed the key concepts and terms in the study, such as ICTs, transnational students, transnational literacies, and multiliteracies. Here, I aimed to engage the conversations around my topic by identifying, analyzing, and synthesizing the literature. Specifically, I identified what has been addressed, what is important to be addressed (gaps), and how this project addressed the conversations or addressed some of the gaps.

2.1 Review of Literature

The proliferation and development of new information communication technologies (ICTs) are often equated with development and improvements in the lives of users. This is not necessarily the case as users differ with context, culture, cultural practices/orientation, economic, and geopolitical factors. The affordances of these new ICTs provide users with a variety of options and usage possibilities, but, as Alladi Ventakesh (2006) argues, the users are more concerned with the integration of these new ICTs into their preexisting lifestyle and attendant habits and usages. Transnational students engage new ICTs in their new environments and experience a "new" reality that may either be similar or different from the experiences/practices in their home countries. The ICT choices and usage of these transnational students, arguably, will be as a result of their encounters with different ICT technologies and how they suit their individual needs and preferences (Carsten Sorenson 2002)– as well as the needs, preferences, and values of their environment in the USA–in communication and in navigating their bifocal realities. The identifier–*transnational student*–may have a different meaning in different contexts, but I will now situate what or who I consider as a transnational student in my research. I consider a transnational person as any person or persons who negotiate, mediate, experience, move, relocate, and transcend

national and international geopolitical boundaries and borders, either physically or physically and virtually, and whether willingly or unwillingly.

Arguably, research on ICTs and transnational students is still emerging, and it is also vital, given the significant increase of transnational students in USA colleges. [2]According to the Institute of International Education, "the number of international students studying in the United States rose by 3.4 percent, to 1.078 million students, during the 2016–17 school year." At this rate, one cannot overlook the importance of understanding transnational students' use and engagement of ICTs–a fundamental part of both their academic and non–academic stay in the USA. Some of the research is related to transnational students but does not directly address my specific research topic. For example, Patrick Berry, Gail Hawisher and Cynthia Selfe (2012) sought to "understand the digital literacy practices of a generation of students with transnational connections," while Lam and Warriner's (2012) study highlights the importance of exploring and addressing the evolution and advancement of communicative technologies (e.g., cheap telephone calls, satellite television, online media, ubiquitous print media, affordable modes of travel) in constructing the lifeworlds of transnationals. Also, in a related study, Habib, Johannsen, and Øgrim (2014) tried to understand international students and their use of technology in a Scandinavian institution of higher education. Meanwhile, Breen, Lindsay, Jenkins, and Smith (2001) investigated how undergraduates use and think about information and communication technologies (ICT) in the context of learning at university.

Berry, Hawisher, and Selfe (2012), in their study, *Transnational Literate Lives in Digital Times*, document how students within and outside the USA engage digital literacy practices and

[2] With Trump's immigration policies and the COVID–19 pandemic, we may experience a decrease in the number of transnational students in USA colleges.

how those practices fold and unfold daily in the lives. The study was conducted with a total of fourteen participants with varied geopolitical situations. Using a mix of images, audio, words, and even video clips to collect data, the authors stated that the goal of the project "is to understand the digital literacy practices of a generation of students with transnational connections." Understanding the importance of diversity, life histories, and digital literacies of transnational students, the authors call our attention to the importance of considering the local perspective and the complex process of globalization of this group of students. Transnational students take up and use digital ICTs to extend and maintain their communicative, social, familial, and cultural practices as they negotiate their bifocal lifeworlds. The study conducted by Berry, Hawisher, and Selfe is both similar and also significantly different from the study I conducted.

It is similar in that it sought to understand digital literacy practices of transnational students, but different in that the participants were all transnational graduate students who attended the same institution in USA. They, therefore, possessed characteristics different from those in the study conducted by Berry, Hawisher, and Selfe. Thus, the study aimed to understand the differences/similarities of transnational students ICT digital literacy practices or the multiliteracies involved in navigating–in and navigating–with a particular ideological space–academic and non–academic– in their quest for education in their bifocal lifeworld.

Transnational students' lifeworlds are experienced from a bifocal perspective as they need to negotiate and navigate many different experiences and events–the experiences and events which can be considered as the native (where that person can identify as home) and the adopted (where that person migrates or relocates to, whether physically or virtually). Lam and Warriner (2012), in *Transnationalism And Literacy: Investigating The Mobility Of People, Languages, Texts, And Practices In Contexts Of Migration*, position bifocality as involving the tendency of migrants to

compare life experiences and situations from different points of view of their home countries (or whatever they construct as home country)[3] and adopted societies (or whatever they construct as adopted country)–which signals the impact of transnational connections and activities on the cognitive, social, and cultural orientations of migrants (Lam & Warriner, 195). Transnational students maintain social relations across borders, navigate and position themselves in various social fields and participate in cultural, economic, or political activities within social networks that span borders and also integrally involved in the flow of economic resources, ideas, images, and contact with people far away (Warriner & Lam, 2012), relying heavily on ICTs.

Lam and Warriner highlight the importance of exploring and addressing the evolution and advancement of communicative technologies (e.g., cheap telephone calls, satellite television, online media, ubiquitous print media, affordable modes of travel) in constructing the lifeworlds of transnationals. (p. 193–4). Thus, Lam (2009) and Sánchez (2007) postulate that "working productively with the transnational habitus of students would require us to consider how the textual materials that students are exposed to may be derived from diverse communities and mediate their access to different kinds of knowledge across local and translocal spaces" (p. 195). These transnational students, therefore, engage in navigating their lifeworlds from different fronts, which include the cognitive, social, cultural forces. I expand on this by arguing that we also need to consider the political, economic and technological forces as they form an important part of a transnational student's lifeword.

Furthermore, following Warriner and Lam's call for the exploration of the relationship between communicative practices and multilayered relationship that migrants develop across

[3] A home or adopted country is flexible depending on individual choices. For example, a person may take–up new identity as a USA citizen even though he or she was not born in the USA. They could then construct the USA as their home country or new home country.

geographical borders (p. 192), this study investigated the ICTs that transnational students used in navigating and mediating these communicative practices in their bifocal lifeworlds. In particular, it explored transnational students' literacy practices within intersecting local and global contexts and in relation to changing technologies of communications. Specifically, part of my research described transnational students' flows (cf., Appadurai), particularly invoking what Forstorp, & Mellström coined eduscapes. Forstorp, & Mellström (2013) define eduscape "as the transnational flow of ideas and people in regard to research and higher education and where nodes of knowledge centers, peripheries, and positional dynamics shift over time but are connected through modern communication technologies and different epistemic, ethnic and learning communities" (p. 336). Just as Appadurai posits on scapes working in the imaginary, eduscapes works in the same light in understanding the imaginary and bifocal realities of the lifeworlds of transnational students. This understanding, Berry, Hawisher, and Selfe (2012) posit, can only happen when we are willing to cross borders." The bifocal lifeworlds of transnational students position them to experience different forms of digital literacies or multiliteracies.

The term *multiliteracies* invokes the idea of multiplicity in the ways we come to know, communicate, experience, and navigate the world daily. The term multiliteracies is credited to the New London Group (1996) who states that multiliteracies invite us to [re]consider and [re]think our traditional literacy approaches by taking into account the multiplicity of communication channels (new communication technologies or ICTs such as the Internet, multimedia and digital media), and the reality of an existing cultural and linguistic diversity due to transnational migration . Thus, as the New London Group argues, multiliteracies overcome the limitations of traditional approaches by "emphasizing how negotiating the multiple linguistic and cultural differences in our society is central to the pragmatics of the working, civic, and private lives of students" (p. 60),

often informed by the ICTs choices and uses by transnational students, in navigating their bifocal realities. In other words, there exist multiple forms of literacies or multiliteracies, and this is, in part, influenced mainly by the proliferation of new ICTs and the transnational migration–in the context of my study, transnational students as migrants.

Transnational students form a significant part of the migration population. Transnational students negotiate, engage, and navigate new communication technologies when they migrate to new locations, locations not familiar to them from a geopolitical perspective. The different ICT choices and uses by transnational students may be informed by several factors ranging from economic, culture, geopolitics, and others. These are things this study hopes to unpack. These transnational students bring along their linguistic diversity and also pick up new forms of linguistic structures and modes as they live and experience their new environments. Their bifocal lifeworlds become a hotspot in which they produce and experience different forms of multiliteracies. Adapting the position of the New London Group who states, " the changing technological and organizational shape of working life provides some with access to lifestyles of unprecedented affluence" (p. 61), we need to investigate (through research) and unpack how these new communication technologies or ICTs construct and reconstruct the lifestyles of transnational students in terms of technological choices and uses.

The ICT choices and uses made by transnational students enable them to become designers (New London Group, 1996) of their lifestyles, and designers of meaning (New London Group 1996) of their realities, and thus, designers of their social futures–workplace futures, public futures, community futures, (p. 65) as well as their academic futures. According to the New London Group (1996), "just as there are multiple layers to everyone's identity, there are multiple discourses of identity and multiple discourses of recognition to be negotiated–we have to be proficient as we

negotiate the many lifeworlds each of us inhabits, and the many lifeworlds we encounter in our everyday lives" (p. 71). Transnational students experience such negotiations in terms of the different ICT choices and use that creates multiple discourses of identity and the ICT lifeworlds they inhabit and the many ICT lifeworlds they encounter in their everyday lives. Transnational students encounter such experiences by engaging in different literacy practices and events and thus enact/experience different multiliteracies.

Meanwhile, in their study, *Experiences and Challenges of International Students in Technology–Rich Learning Environments,* Habib, Johannsen, and Øgrim (2014) point out the need to differentiate between different types of international students in a culturally diverse higher education system. Using Actor–Network Theory as a theoretical framework, the study was conducted to investigate and understand how international students use technologies in a virtual learning environment (VLE) in a Scandinavian institution of higher education. Using interviews to collect data from forty participants, the findings of the study reveal that "technology as a socio–material assemblage may encapsulate cultural codes that can be alienating for international students and that there is a need to "open the black boxes" of technology to cater for the needs of international students" (p. 196). These "black boxes," or what I consider as the mainstream beliefs of ICTs, differ with context and location–what may be considered a black box in Norway's educational system may not be the same in the US. Thus, we can only open the black boxes by first discovering them–something this research study also hopes to reveal in a specific US college setting.

It is becoming inevitable to understand the life histories and digital practices/literacies of transnational students in negotiating different ICTs both in their academic and non–academic bifocal lifeworlds. These students , consciously and unconsciously, compared their experiences in

their current environment (the US in this context) with the experiences in their home countries or country of birth. By crossing and negotiating borders, transnational students enter a space that invokes a wrestle between the imaginary and the bifocal realities (Appadurai, 1990) of their use and engagement of ICTs. This space permeates different digital multiliteracies to be produced as a result of the different linguistic and cultural differences that these transnational students engage. Without acknowledging, appreciating, and accepting the differences that transnational students bring to the ICTs world, we tend even to fasten the locks of the black boxes (Johannsen and Øgrim, 2014) that alienate them from being considered from the design development and production of different ICTs.

2.2 Preview of Chapters

In the following chapters, I engaged these conversations in my case study with three transnational students. Specifically, chapter three focused on the narratives of a transnational student from a southern continent or country that is located in what I will describe as South of the digital divide. Also, I addressed the ICTs literacy narratives, interpretations, and analysis of a transnational student from Africa. Chapter four addressed the narratives of a transnational student from North America who commutes the Southern U.S. border daily in quest of education. Specifically, it focused on the ICTs literacy narratives, interpretations, and analysis of a transnational student from Mexico.

Meanwhile, chapter five involved discussions on the narratives of a transnational student from an Asian country. I addressed what I meant by digital sun setting in the east. The main component of this chapter focused on the ICTs literacy narratives, interpretations, and analysis of a transnational student from Asia. Chapter six examined the findings of all the chapter and identified important insights from the narratives/experiences to suggests and recommend ways of

understanding the Information Communication Technologies (ICTs) and their relationship to transnational students literate lives. It provided suggestions and recommendations for industry–in relation to understanding the ICT practices of transnational students in order to design, produce and provide ICT technologies that incorporate the experiences and worlds of transnational students– and also to academy in regards to the assumptions and realities of these group of students in engaging ICTs in their quest for higher education.

Chapter 3: Negotiating the Digital Divide: Bridging North and South

This chapter focused on the narratives of a transnational student from a southern continent or country that is located in the South of the digital divide. Specifically, I focused on the ICTs literacy narratives, interpretations, and analysis of a transnational student from Africa.

3.1 Country Background: Ghana

Ghana is a country found in West Africa. According to a 2009 population census, the country has a population of approximately 23.83 million people. Being the first country in Sub–Saharan Africa to emerge from colonialism, Ghana's economy is substantially boosted by trades in gold mining, cocoa, pineapples, and timber. This is reflected in their average annual real GDP growth rate of 8.5%. Politically, Ghana is one of the few countries in Africa that runs a vibrant multi–party democracy similar to that in the USA. As a result of its growth and progress in both the African and world stage, Ghana has embraced the inevitable importance and incorporation of information communication technologies (ICTs) in all aspects of the country–from politics to economy, social, and education integration. Ghana is famous for being the first in many aspects of Africa. It was the first African country to liberalize its telecommunication sector. According to Kofi Mangesi (2007), the government of Ghana placed a strong emphasis of the role of ICT, and they even suggested the use of ICTs as a means of reaching out to the poor–as a strategy for the medium–term development plan in Ghana's poverty reduction agenda (p.4). This process was supported by the development of ICT policies by the country's government.

Mangesi states that the policies address 14 priority areas in Ghana's ICT vision. Some of the priority focus areas include: deploying and exploiting ICTs in education; deploying and spreading ICTs in the community; developing R&D, scientific, and industrial research capacity; accelerating human resource development, and; providing legal, regulatory, and institutional

frameworks (p.3–4). With regards to promoting ICTs in education, the strategies to achieve this included: ensure that students have ICT literacy skills before coming out of each level of education; provide guidelines for integrating ICT tools in all levels of education; give means on standardizing ICT resources for all schools; facilitate the training of teachers and students in ICT; Determine the type and level of ICT needed by schools for teaching and administration purposes; and promote ICT as a learning tool in the school curriculum at all levels (Mangesi, 2007, p.4).

Despite the massive investments in ICT infrastructure and ICT capacity building, Robert Ankomah (2004) highlighted some of the challenges and problems that the ICT sector in Ghana has to address. They include the lack of critical drive and strategies to harness the full potential of ICT for the socio–economic development of the country; the high cost of Internet usage; the brain drain syndrome of ICT for education, research, and development in the country; lack of a proper mechanism to address interconnection issues with particular reference to fix to mobile operations, development and delivery of fundamental economic problems for regulators, which includes competition policy, costs and pricing and finance for regulators and; the lack of enabling environment and the political will to do things (p.4).

3.2 Participant Background

Tee is from Ghana and currently a full–time 3rd year Ph.D. student in the Rhetoric and Writing program. His age range is between 31–40, and he speaks/writes using two languages: Twi (Asante)–a local Ghanaian language–and the English language. He uses mainly the English language for academic purposes and a mix of Twi, English, and Pidgin English to communicate with family and friends, and as well as to navigate his daily social life. He enjoys reading eBooks on his iPad, playing video games and watching TV. He occasionally collects classic novels from

thrift shops and reads them as part of his hobby. He teaches undergraduate Rhetoric and Writing courses.

3.3 ICT Background

Tee considers ICT as any technology used in enabling communication with people from far away. He adds that it often involves using data with new technology such as the internet, computers, and smartphones. Tee communicated with friends, family, and colleagues using a mix of old and new media. He preferred to use new media.

"…these days the new media is increasingly becoming predominant because it is very accessible, so, I normally use the new media. Now that I am in the USA, I normally use WhatsApp to communicate with my friends who have WhatsApp–enabled phones. That to me constitute about 90% of my communications."

Tee used WhatsApp as a primary communication tool with persons who had access to the internet. Alternatively, he bought online credit to communicate (by making regular phone calls) with those who did not use the app because they did not have access to the internet. Tee's preferred medium of communication is WhatsApp, but he also used Facebook Messenger to communicate with both previous colleagues in Ghana and current colleagues in the USA. He mostly engaged these technologies via text messages, voice messages, voice calls, and as well as video calls.

3.4 ICT: Ghana Versus USA

Tee explained that his experience with using technology in Ghana and the USA is somehow similar. A key factor with the differences in usage was with the cost of usage. For example, in Ghana, university graduates and other people who had access to WhatsApp preferred to use the app for texting and calling because it was relatively cheaper than using a standard text messaging and calling system. This was quite the opposite of his experience in the USA, as many people

preferred to text and call using regular phone networks rather than using WhatsApp or any other internet–supported app. Also, most people in the USA had the luxury of unlimited calls and texting, something that was not available in Ghana.

3.5 ICT Ownership and Usage

Tee considered himself a "modern" man because of his ownership and usage of a variety of technologies.

"…I think I have almost everything that will make me a modern man. I have a computer, first of all, MacBook pro… I also have an iPad pro… an iPhone… So, I think I am kind of very well rounded with regard to communication technology."

He owned a MacBook Pro laptop, a touch screen iPad pro with the pencil, an iPhone, and a Kindle book; he had access to Kindle book on any of the technology devices he owned. According to Tee, owning these technologies brought the convenience of usage in tasks, provided an advantage of multitasking because of their versatility, and got things done faster.

"…Some of them are better at certain tasks than the others. So, sometimes if you want convenience, you just have to own all of them so that any time you want to use this one or the other one, you just use it."

Also, these technologies served different purposes, and they were good at doing different tasks. For example, Tee stated that a laptop was more productive in typing with the use of a physical keyboard; the iPad was good with consuming media—watching videos and reading—and the phone was good with communicating with friends. Tee engaged these technologies in many areas of his academic and non–academic life. Some of the areas of engagement included the academy, family, friends, job, and social life.

3.6 ANT Mapping

I used maps to project the different technologies that he engaged in, the different areas of engagement, and the frequency of his engagement of these technologies in his life. The maps are based on the key below, which is described in Chapter 1.

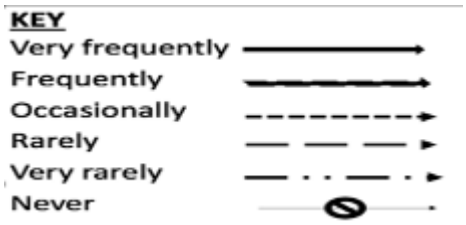

Figure 3.1: Mapping key

3.7 ICT and Academic Use

Tee used his MacBook Pro, iPad, smartphone, and Kindle book life for completing different tasks in his academic life.

"whether it's for typing, for video editing, if you are doing some search online and you want to flip through different databases at the same time, I think computer makes you more efficient… I think most academic databases are more friendly to computers and computer–based browsers than on mobile based browsers. So, I tend to use those ones for very serious or very rigorous academic work. That's the MacBook pro."

Tee used his phone as a backup device as it was the easiest and quickest to access information both as a teacher and student. Also, his phone could do almost everything that the other technologies did, but a setback with phone usage was the screen size– performing tasks became difficult due to the small screen size.

As a student, he used his iPad for reading, importing PDF documents using Google Drive/Doc using an app called Notability, as it made reading easy with the help of the annotation

function. Also, the use of the Apple Pencil to annotate readings on iPad as it made reading easy and iPad voice notes and snapshots aided in his studies.

As a teacher, Tee often used Airplay and Apple TV to teach his students because they made work easy by enabling screen sharing with a phone, iPad, and computer. Also, the Airplay had the benefit of making teaching easy as the wireless option enabled easy access to teaching, presentation, and sharing of materials with students. Tee added that Airplay had the advantage of easy classroom mobility without having to stand in front of the classroom to use a computer to teach. Tee did not own the Apple Tv but had plans to buy it soon because it was a technology he used a lot in his teachings. Also, he owned mostly Apple devices, and this is compatible with the technology.

Tee preferred to use his personal computer in teaching rather than the computers found in classrooms because his personal computer was customized according to his needs; it was more convenient and provided a sense of security with private information. Tee used different technologies in teaching, depending on his needs. He used an Airplay wireless connection to connect his computer to teaching aids such as a projector. Also, he used cloud computing in storing data used in teaching, with the help of accessing files via Google Drive and Microsoft drive. Blackboard is the primary learning management system (LMS) of the institution, and Tee used Blackboard as an integral part of his teaching. Sometimes, he used Google Docs and Microsoft One Drive as backups to teaching.

3.7.1 ANT Mapping: ICT and Academic Use

This ANT mapping represents Tee's engagement with ICTs in fulfilling his academic commitments. This map is based on Tee's narratives.

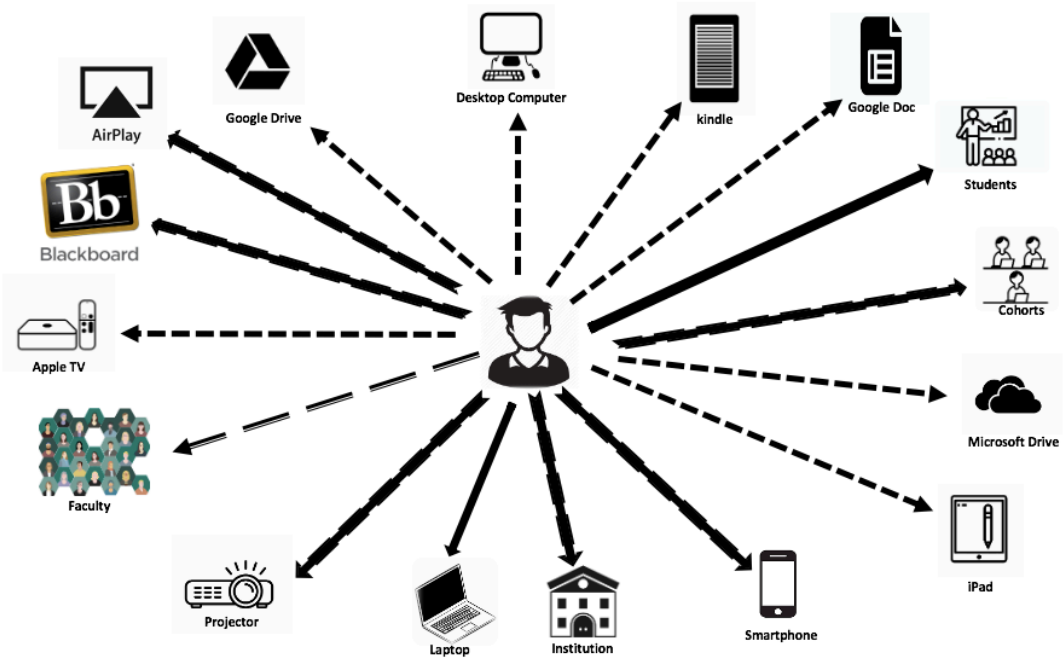

Figure 3.2: *Engaging different ICTs in academic setting*

3.7.2 Experience: Some Benefits and Challenges

Tee's describes his experience with the use of technology was great, eye–opening, and somehow challenging. Despite the challenges, Tee always kept a positive mindset and had devised a way to navigate the technologies productively.

"I don't see technology as a challenge. I think an interface is created by a human being so I try to… I was talking to someone and the person said it supposed to be called digital phronesis where you are able to apply wisdom; you are able to think like the designer of the technology and you are able to navigate the interface based on the wisdom you have from other you have used.… So, any time I encounter a problem, I try to think like whoever designed it and I try to if it was me who designed this technology, how would I do it. So, I try to think like the person and I'm able to surmount most of the challenges that I have. So, so far it has really been good for me."

With such a mindset of self–belief and thinking like the designer, Tee is still on the learning journey as he acknowledged that he did not know everything about the usage of many technologies he engaged.

"I go to the Technical Support Center at UTEP library and they are able to guide me on how to use the technologies. So, I am open to learning and I am still learning."

Tee believed he was well prepared to use technology in his graduate studies in the USA as he was familiar with most of the technologies and considered himself a champion in using technology as a teacher back in Ghana.

In terms of the challenges, Tee identified poor internet or lack of, and power outage as a challenge in using technologies in teaching in Ghana. However, he stated that it was not the case in the USA as there was a constant power supply, internet availability, strong internet network as a positive experience in the USA. A challenge he faced with technology in the USA was the use of new software. Tee resorted to using online tutorials and the institution's leaner support center as a guide to help in using these new technologies.

3.7.3 ICT and Design

Tee was concerned with the design of certain computer interfaces as he believed they did not consider the students, and this became a challenge for students as most of them did not have the necessary literacy skills to navigate the technologies easily.

"…interfaces of computers are designed not necessarily…I am talking to you as somebody who has critiqued interfaces before and they are made for purposes. More often than not, they are not really made with the student as the primary user or something. When that becomes the case, you have to adapt it to your own purposes…. Basically, most interfaces are sort of adaptable to suit us… If the icons have to be at certain places, you have to reorganize things to sort of meet your

own usage. Unfortunately, it's not every student who is able to do that. Some students find it hard to really understand how to customize technologies to suit themselves."

Technologies designed without certain users in mind makes it difficult for those users to usurp the full potential and capabilities of those technologies. The students need more than just computer literacy skills to maximize the use of computers. They also need computer user interface customization skills in order to tailor the computers to meet their needs.

3.8 ICT and Family

Tee's nuclear family is in the USA while his extended family is in Ghana. He communicated daily with his family using his phone via regular phone calls or WhatsApp calling and messaging apps. He communicated with family using other calling/messaging apps such as Viber and IMO but had to stick with WhatsApp because it uses low data and guarantees good connectivity. Tee's mother used to communicate with him using paid airtime at call centers, but he recently bought her a smartphone, and he now communicates with her using the WhatsApp. He taught his mum how to conserve battery power and to save phone data. Tee requested that his mum save battery power and data with the following advice:

- He told his mum to switch off data to save the battery life, especially on a small to medium range quality smartphone.
- Indicated that there was a regular power outage, and switching off the data will help to conserve battery power. Adding that the power outage can deter communication because of the inability to recharge the phone when you run out of battery.
- Stated that data was expensive and switching it off will help save data for more communication.

Saving battery life and data did not guarantee excellent communication, as the location and position of the caller were also critical. As such, Tee always advised his mum to search for an excellent location in order to have good data service reception for good call experiences.

Tee mostly communicated with his mum using audio messages and pictures as she was not versed in text messaging.

"...she is able to send me pictures from home; she is able to send me voicemails, voice messages because unfortunately, she doesn't know how to text. So, I told her that she should send me voicemails, messages or audio messages on WhatsApp and she does that sometimes."

3.8.1 ANT Mapping: ICT and Family

This ANT mapping represents Tee's engagement with ICTs in communicating with his family. This map is based on Tee's narratives.

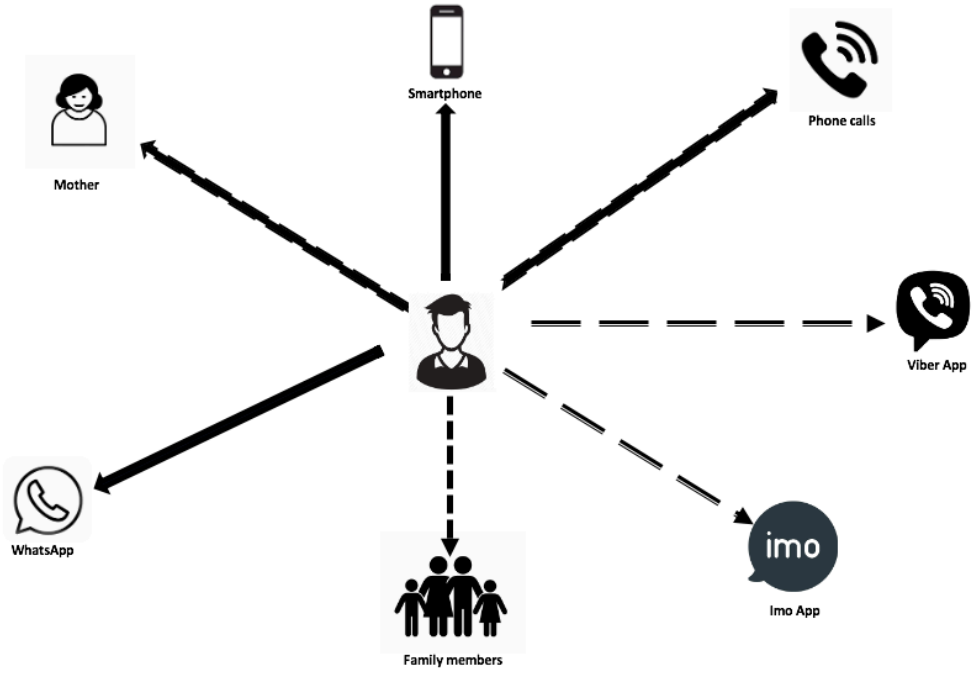

Figure 3.3: *ICTs and interaction with family*

3.8.2 Experience: Some Benefits and Challenges

For Tee, owning a phone is very important as it was essential for communicating with family. Also, there were varieties of phones that he could choose from–so cost was not a factor that could affect ownership.

"...phones are not for free and in Africa phones are also very affordable. There are phones for everybody. There are phones that cost some few dollars, so, everybody manages to get their own phone."

By using WhatsApp to communicate with family, Tee was satisfied as he considered the app to be convenient with communicating and also affordable, as all you required was access to a smartphone with an internet connection.

Also, Tee indicated that the WhatsApp user interface makes it easy to use and easy to teach others to use it productively. Despite these benefits, communicating with WhatsApp was not all that smooth, and Tee faced some challenges with using WhatsApp to communicate with family. The biggest challenge being poor quality communication due to poor data connection services or service interruptions and his family members being able to locate right spots that have excellent data receptions/connection services. Fortunately, he and his family had been able to pin down spots that had excellent quality network reception services.

3.9 ICT and Friends

Tee has many friends around the world who are mostly tech–savvy. He used his computer, phone, and tablet to communicate daily with his friends, either via WhatsApp, Skype, Facebook, Instagram, or Twitter. Communication on WhatsApp was mostly done through group chats as they could exchange over tens to hundreds of messages in a day. On social media–Facebook, Instagram,

and Twitter, Tee communicated with his friends via status comments and sometimes direct messages.

"...on Facebook, we communicate through the regular status update. We also communicate on the comments, on the updates. You know, maybe you post a picture on Facebook and somebody will, instead of saying, "This picture is nice," say "Hey, TEE, how are you doing?" So, you end up creating a thread on normal conversation, talking about something different other than the picture.

3.9.1 ANT Mapping: ICT and Friends

This ANT mapping represents Tee's engagement with ICTs in communicating with his friends. This map is based on Tee's narratives.

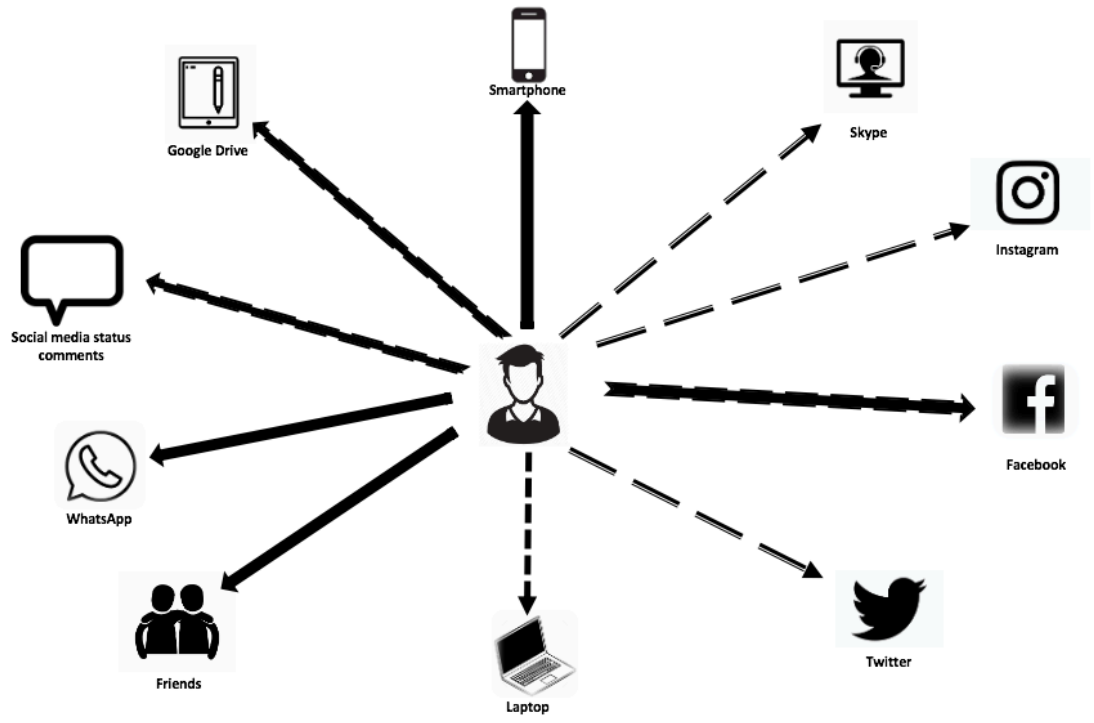

Figure 3.4: *Engaging ICTs with friends*

3.9.2 Experience: Some Benefits and Challenges

Using these technologies in communicating with friends had been very beneficial as it helped him to stay connected with friends. However, Tee acknowledged that it also brought some challenges. One of the challenges was the ability to control the online and offline status as he ended up engaging in unplanned conversations. Although he could manage the unplanned conversations, he would have preferred that his offline status stayed as offline rather than misinform his friends that he was online.

3.9.3 ICT and Design

According to Tee, WhatsApp is a versatile platform that enables synchronous and asynchronous communication, flexible message sharing, online status function, status sharing function that include text, images, and videos. The status sharing function helped triggered conversation and enabled his friends stay in touch. He also identified the fact that WhatsApp was a leader in innovative technology as other messaging services like Instagram and Snapchat were mimicking/copying their status sharing service from WhatsApp. It should be noted that Facebook owns Instagram and Snapchat and thus a reason for similar interfaces used in the technology platforms. In general, he was satisfied with communicating using WhatsApp but at the same time pondered on what the future held.

"…*they serve the purpose that we want them to serve. Sometimes, it's very hard to fathom how it's going to be in future because at the moment I think they serve the purpose and they are able to help us stay in touch with each other."*

3.10 ICT and Job

Tee did not have any job outside teaching, and the technologies he used in his teachings included his laptop computer, smartphone, iPad, projector, and Google Docs and as well as the learning management system of the institution–Blackboard. He usually uploaded course syllabi, created class plans on Blackboard, and also used Google Docs and outlook.com to facilitate his teachings.

3.10.1 ANT Mapping: ICT and Job

This ANT mapping represents Tee's engagement with ICTs at his workplace. This map is based on Tee's narratives.

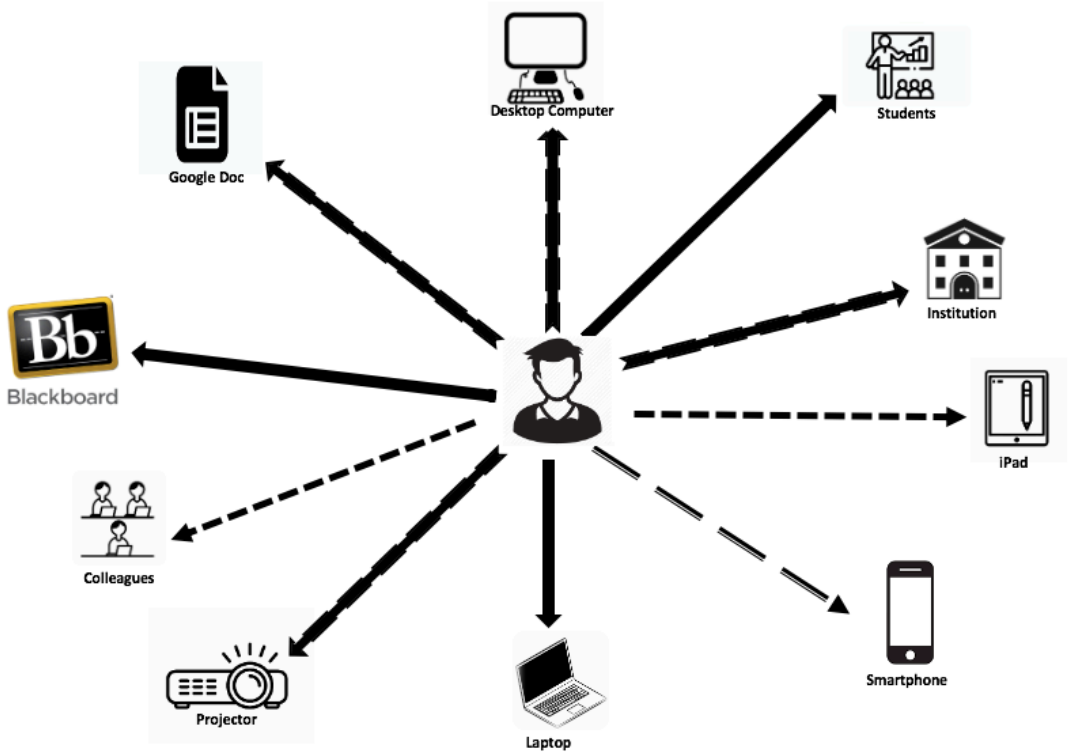

Figure 3.5: *Engaging different ICTs at job*

3.10.2 Experience: Some Benefits and Challenges

Teaching with these technologies were very beneficial to Tee. They aided in his teaching by getting the task done faster, made him a productive teacher, made his teaching easier and effective, and also efficient as he did more within a short time. Aside from these benefits, Tee had also experienced some challenges.

A major challenge he faced were the difficulties involved in adapting with using these technologies. Tee identified that another challenge with using these technologies in teaching was the fact that most of the technologies were not designed with teachers/students in mind, and this made teaching/learning a difficult task for both the teacher and the students.

"...some of them are not designed for the school system. So, they need to be customized/tailored to suit our needs. For instance, the computer interface as I mentioned some time ago is not meant for students; it's not programmed with students or teachers in mind and so we have to be able to learn how to tweak or to change it to suit our purposes".

This made the tasks of the students and teachers in using the technologies harder as they had, first, to adopt the technologies to meet their needs–through customization– and then, go through a training/learning process in order to be able to use these technologies, productively, in teaching or studying.

3.11 ICT and Other Social Interactions

Technology was integral in Tee's daily life–from communicating with family, friends, colleagues, to getting information on the weather or a travel destination route. Aside from using technology to communicate with friends in a social context, he also engaged technologies in other social contexts such as weather, transportation, entertainment etc. For example, he depended on technology for guidance and directions, such as finding bus stops using GPS, checking the weather

to determine the suitable dressing, and using Google Maps to move around. This saved him the stress of asking for help from people.

Tee used different ride–sharing apps to move around the city. His choice of ride–sharing app was dependent on the best rates and the best geographic location identifier.

"…If I want to get a car, I use Uber app or Lyft… what I do is I check the one which has the best rate… I key my destination onto either apps and the one which gives me the best rate is the one I use all the time… One of them does not allow you to share your location and so whoever is coming to pick you up, the driver will have to figure out where you are…"

3.11.1 ANT Mapping: ICT and Other Social Interactions

This ANT mapping represents Tee's engagement with ICTs in different social contexts other than communicating with family and friends. This map is based on Tee's narratives.

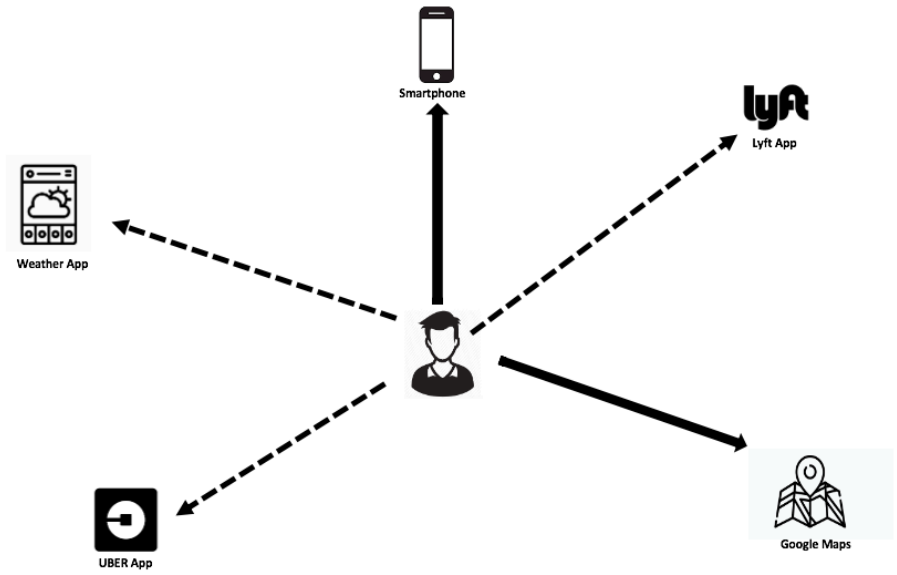

Figure 3.6:*Using ICTs in other social contexts*

3.11.2 Experience: Benefits and Challenges

Tee acknowledged that technology had been beneficial, functional, convenient, and made his social life more comfortable to navigate. He considered technology very good as they aided in our living. Although technology was sometimes complicated, it simplified life when you knew how to use it. He is very independent, and technology helped him significantly with this trait in navigating his academic and social life in the USA.

"…I use technology every day in my life and now I wonder how I am going to live without a form of technology/ICT in my life. When I came to the US at first, I was pretty much very independent person. I didn't know many people around and so, I depended on technology to move from point A to point B."

3.12 Conclusion

Coming from Ghana, Tee had significant exposure to technologies and even considered himself prepared to use technology in his graduate studies in the USA. This usage intensified when he moved to the USA, and it became an inevitable part of his bifocal reality. Tee constructed himself as a "modern" man with regards to owning and using a variety of technologies. WhatsApp formed a significant part of his communication with his family. Meanwhile, Facebook and WhatsApp constituted a significant communication medium with friends. His laptop was his go–to device for educational use while for executing his job duties, Blackboard (using his laptop) was the most frequently used technology. His use of Google maps on his smartphone was the technology he mostly engaged in navigating other social contexts. Using technologies comes with challenges as well as benefits.

Tee bemoaned the fact that poor communication connection services–due to poor data connection services– and also the fact that some of the technologies were not designed with particular users in mind. In general, he considered technologies to be very good as they aid in our living and are essential for communication.

Chapter 4: Digital Literacies and Commuting Borders

This chapter focuses on the narratives of a transnational student from North America who commutes across the Southern U.S. border daily in quest of education. Specifically, it focused on the ICTs literacy narratives, interpretations, and analysis of a transnational student from Mexico.

4.1 Country Background: Mexico

Mexico, officially considered as the United Mexican States, is a country found in the Southern region of North America. With an estimated population of over 123 million people, the country has a GDP growth rate of 2.0% (World Bank). Often identified as an emerging global power, Mexico's economy is boosted by investments in food and beverages, tobacco, chemicals, iron and steel, petroleum, clothing, motor vehicles, consumer durables, and tourism. Its economy also benefits significantly from the export of vegetables, coffee, silver, fruits, cotton, oil, and oil products. Due to its economic relations with the world, the importance of ICT in creating and maintaining these economic networks cannot be overemphasized.

The importance of ICT implementation by the government has significantly supported Mexico through constitutional reforms and sector laws. According to Alexia Fanfalone (2015), in June 2013, the Mexican government approved a constitutional reform and a new sector law, which came to effect in August 2013, to tackle the main issues surrounding the telecommunications sector. This, Fanfalone argues, will play a role in increasing Internet access to the population (p.3). She reveals that more than 85% of Mexicans have access to mobile phones, and about 31% of households have Internet access in 2013 (p.3).

Although there have been constitutional reforms and policies to support the growth, development, and implementation of ICTs in Mexico, and the tremendous increase in broadband

availability around the world, the country still faces some challenges in the ICT sector. Some of the challenges include slow Internet connections–more than 2.5 times slower than the connections in the United States and the lack of ICT infrastructure (Fanfalone, 2015, p. 8). As a way to remedy some of these challenges, the government, through constitutional reforms, proposed regulatory strategies to help improve the ICT access and development in the countries. Some of the plans include lowering the cost of network, deployment of efficient spectrum management, and lowering the cost of telecommunications services by fostering competition through mobile market regulation (Fanfalone, 2015, p.12–13).

4.2 Participant Background

A is a third–year doctoral student in the Rhetoric and Writing program. He is from Mexico and uses two languages to navigate his academic and non–academic life. The two languages include English and Spanish. He uses English for academic purposes and a mix of English and Spanish to communicate with family and friends and as well as to navigate his daily social life. He is between 41–50 years old. He is a first–generation college student and a computer aficionado committed to the *pask'op*–liberation through rhetorical sovereignty–of digital technologies. He teaches Rhetoric and Writing studies at the university where he is a student.

4.3 ICT Background

A considers ICT as everything that makes use of computers and the internet. Growing up as a kid, A had just basic knowledge about the use of computers because of a lack of access. He mostly got exposed and started using computers significantly during his undergraduate education.

However, his use of computers at this level mainly was for basic computer programs and involved minimal use of the internet.

"…so, when I was doing my undergrad, for example, I would use computers. Actually, I wouldn't use the internet. I would only use computers to work with Word processors and I had had some courses on Office back in my undergrad and that's the only knowledge that I had when I started doing my undergrad. So I had some basic skills of computing but I didn't use internet a lot."

Computers and the internet provide a space for people to share information, and this information could be in the form of education or entertainment. A used the computer to conduct library research with electronic books and as well as a form of entertainment by watching videos. As he advanced his studies through to the master's level, A engaged ICTs mostly for research and this ICT research literacy made him standout from his colleagues.

"…But when I got my master's degree, the thing completely changed because all of my research was…I think most of my research, a lot of the sources I used to do my thesis were electronic; actually, I don't remember using a physical hardcopy. Everything was done in the web and so I believe, you know, that I had, unlike some of my cohort–colleagues, a lot of experience in using information technologies to do academic research."

A had obtained a form of ICT academic research capital that, he believed, would help him in engaging ICT in his doctoral studies in the USA. He credited his experience and knowledge in using computers to his brother and his previous jobs working in a computer assembly line, and at an IT department in a supermarket in Mexico.

"my brother was computer enthusiast. And, he knows a lot about computers. He would never buy computers already put together, but he would buy the parts of the computer and put the computers

together. So, I learned that and that's what I do. I put my computers together. I don't buy them at retailers …I feel that I have a very very good grasp on ICT, communication technologies and information technologies."

A's experience from learning from his brother and working at jobs that made significant use of ICTs help him build a certain level of competence in engaging ICT in the academy and outside the academy. One cannot replace the level of confidence and competence gained by customizing and assembling your own computers.

4.4 ICT: Mexico Versus USA

When it came to communicating using ICT, A predominantly used WhatsApp and Facebook to communicate with family, friends, and colleagues. He was not a fan of video communication and would avoid it whenever possible. According to A, video communication made him experience anxiety issues, created a slow response experience, it seemed artificial, and the abrupt connectivity issues made it even harder to have a good communication experience.

A's experience with the use of ICTs in Mexico, and the USA were similar and different in specific domains. For example, in the academy, A's use of ICT in Mexico was different from his use of ICT in the USA.

"… registering and all that, I used to go to the department's office and do everything in there. You know, get the course numbers down on a piece of paper. So, when I got here, I had to learn a lot of things especially registering for classes. I feel like, for example, this is a culture that is heavy on the use of email so, everything has to be done via email or skyping."

Even though we could argue that technology makes certain aspects of academy easier, on the other hand, technology becomes a challenge to others and even invokes situations beyond their control.

A often became anxious with the use of certain technologies, for example phone calls, and considers the experiences of using technology in a USA college setting overwhelming–at least compared to his use of technology in Mexico. After two years of using these ICTs, A became comfortable with the use of the ICTs.

A's experience with using ICT in USA and Mexico was similar in academic research. However, Blackboard was one technology he had used in Mexico but the areas of usage in the USA institution were somehow different from his areas of usage in Mexico. With Blackboard being the learning management system at the USA institution, A expressed surprise with its use in the daily life of a teacher. Even though he was exposed to Blackboard in Mexico, it was mainly for training and meetings for faculty and not for teaching or for students to use it to learn. Using Blackboard in this respect was a completely new experience for A.

4.5 ICT Ownership and Usage

A owned a couple of ICTs and some of which include iPhone, laptop, Kindle reader, and desktop computer. The laptop was not his favorite technology, but he owned it because it was less expensive, and ease of transportation when commuting between Mexico and USA for studies. After he got his customized desktop computer, he had to put away his laptop and mainly used his desktop computer. His customized desktop computer was his favorite, and he used it for almost all of his computer–related work–academic and entertainment. He sometimes used his phone for academic and non–academic purposes. He got to own his first smartphone in his first year in graduate school in the USA, and he continued to learn how to use the applications on the phone.

While on campus, A made use of some technologies that he did not own either because they were costly or he did not have access to his open–source versions at his home desktop

computer. A used a lot of open–source versions of software technologies and programs because they were free. Since he could not always have access to the network on campus, he became limited to specific programs that were available when connected to the University internet network such as Microsoft Office and Adobe acrobat reader.

4.6 ANT Mapping

I used maps to project the different technologies that he engaged, the different areas of engagement and the frequency of his engagement of these technologies in his life. The maps are based on the key below.

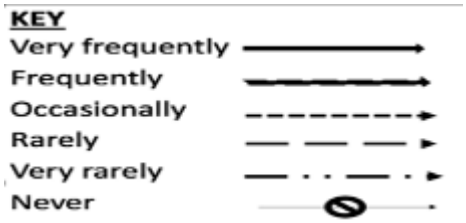

Figure 4.1: Mapping key

4.7 ICT and Academic Use

A used different technologies in his academic life as a student and an assistant instructor. He mostly made use of technologies such as a smartphone, desktop computer, projector, printer, and Kindle. Due to his dislike for laptop–as they did not provide enough opportunities for customization (hardware specifically),–A transformed his smartphone into a mini–laptop as he took notes in class, at conferences, and even did presentations using his smartphone–in fact, he had a keyboard that connected to his smartphone which made it easier to do his projects. Just like his smart phone, A used his home desktop to do class assignments, plan his teaching lessons by uploading teaching materials and in also grading students' papers using Blackboard. Arguably,

students can easily retain and recall information that is presented virtually, and A often used projectors, connected to the classroom computers, to teach his students.

The computers in the classroom have a sound system, and he used relaxing music to engage students by making them feel comfortable in class. Almost all the classrooms have computers, printers, speakers, and projectors installed in them. A used all these technologies to teach his students but rarely used the printer as he was a supporter of the green cause and encouraged students to conserve paper when possible.

Besides using these classroom technologies to teach students, there were other technologies that A used for his personal use as a student. Kindle was his favorite. A had come a long way with using Kindle in his academic life as he used Kindle back in Mexico during his graduate studies and even bought five copies of Kindle and shared them with family and friends. Upon starting his graduate studies in the USA, Kindle was the first new technology that A bought for his doctoral studies. He owned the device and its related software and applications such as E–book creator. He made heavy use of Kindle in his studies, especially with reading class–related materials.

"…I used to own a Kindle a long time ago when I was doing my master's degree so I could read everything on it. All the materials that we used for the class, I read them in there… So, I am a huge fan of Kindle."

Also, he uses a Kindle reader because he has issues with his sight and considers himself a huge Kindle fan.

Another technology he owned and often used in his academic life is his desktop computer. He used the computer to convert materials/documents into formats that were compatible with Kindle, but for those study materials that were not compatible with the Kindle format, he used the

desktop computer to access/read the materials. Thus, the desktop acted as an alternative to the Kindle reader.

Even though he used open source software technologies at home to do related academic work, he always double–check the compatible in terms of formatting by accessing the documents using the campus computers and software, such as Microsoft Office, before submitting the documents–whether it is his assignments as a graduate student or as a teaching material.

As a graduate instructor, he used PowerPoint slides and Google Docs to facilitate his teachings. He frequently used PowerPoint slides as a visual aid because he believed it helped in gaining students' attention and thus encourage in–class participation through reflections and discussions. Blackboard is the official learning management system of the institution, but A made less use of Blackboard and more use of Google Docs as students, he argued, were more familiar with using Google Docs than Blackboard.

4.7.1 ANT Mapping: ICT and Academic Use

This ANT mapping represents A's engagement with ICTs in fulfilling his academic commitments. This map is based on A's narratives.

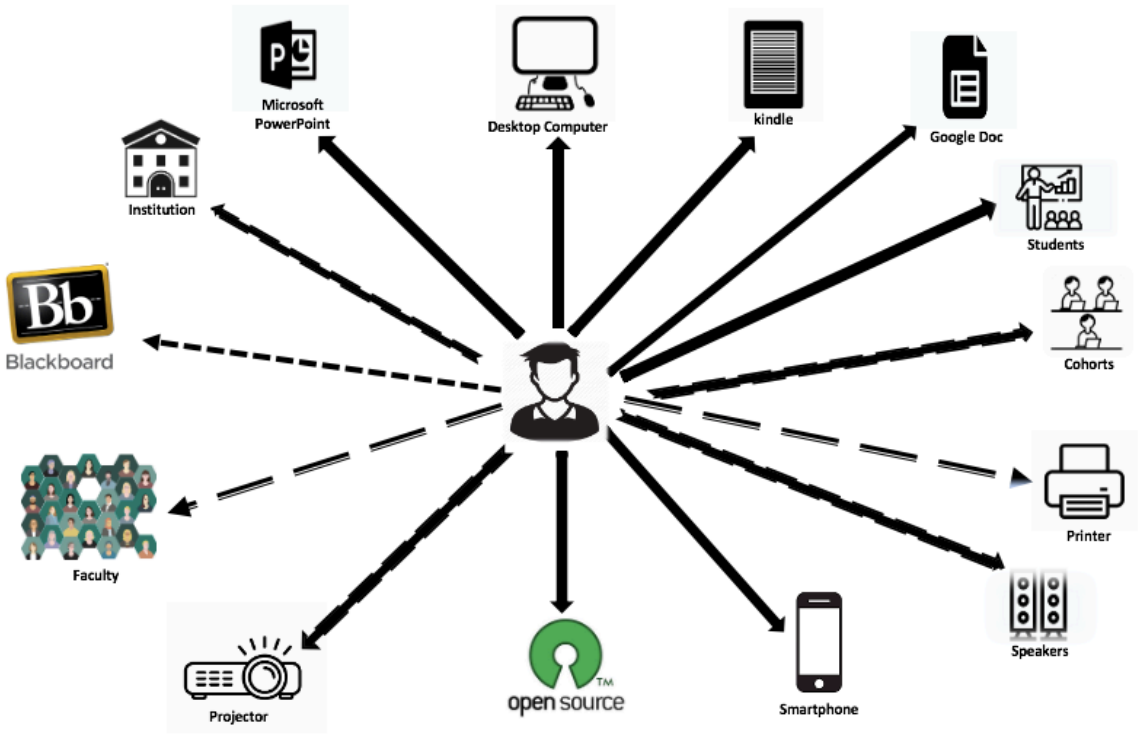

Figure 4.2: *Engaging different ICTs in academic setting*

4.7.2 Experience: Some Benefits and Challenges

An essential aspect of facilitating teaching is the issue of time management. A declared that Blackboard was very time consuming and somewhat confusing but considered Google Docs to be more interactive, intuitive, and easier to navigate than Blackboard.

"..I don't use Blackboard a lot because it is difficult to navigate and it's not intuitive, I think. Most of the things that I wanna do on Blackboard, I always have to do some research and that's so time consuming. For example, things as simple as adding a calendar which I think is very useful is not

that intuitive. At least not for me and I consider myself as a sort of tech savvy in terms of software so Blackboard has been confusing and not intuitive. That's probably one of the reasons that I ended up using other alternatives like for example Google Docs."

A thinks the reason he experienced these challenges with using Blackboard in teaching was because of the lack of preparations to use the technology. Thus, Blackboard technology was not very useful in his teachings. For example, teachers graded papers using Blackboard but A graded students' paper outside Blackboard, using Excel, before transferring the grades into Blackboard. Despite the challenges, A acknowledged that the benefit of using Blackboard was that it made available course teaching materials and links for both students and instructors to access.

4.7.3 ICT and Design

Identifying WhatsApp as one of the technologies he used in his studies, A indicated that he used this technology to arrange meetings and conduct all other study–related communications. He preferred this technology because of its extensive usage, popularity, use of phone contacts, and the use of voice and text messaging in communication. A preferred voice and text messages over video messaging or calls because video calling/messaging made him anxious. He also indicated his dislike of video callings because the delays and pauses in video calls created a sense of artificial interaction

"...I get pretty anxious when I do those calls and the fact the communication delays, I don't think it helps a lot. Because you have to make these long pauses until the other person ends/finishes listening to what you said. You know, the interaction is more artificial when you use video call so I prefer voice messages or text messages over communication technologies."

Design plays a crucial role in influencing users' decisions in their choice of technologies to use. A's decision to use WhatsApp was primarily influenced by its design as it is tied to actual phone numbers.

Even though A used WhatsApp to conduct most of his communications and meetings, he still used a landline phone to call his family as it is more effective and avoided delays often experienced when calling using internet enabled applications.

"...I don't know about, for example, when I need to call my parents, I never use these technologies because of the delay. It's so annoying. So, I actually use landline. I don't even use cell phones. I use landlines because I think it is more effective..."

This was because other forms of communication did not meet his expectations. A communicated with family either once, twice a week, or every two weeks. Besides using WhatsApp and his mobile phone to communicate, A made use and also explored other forms of communication technologies that were not very popular. An example included his use of Trillian and Pidgin, and the exploration of Trello communication technologies.

4.8 ICT and Family

A's entire family is based in Guadalajara, Mexico, a western city known for tequila and mariachi music. A communicated with family using mostly Facebook, on either his mobile phone or desktop computer, and he used it to schedule calling plans. He sometimes used WhatsApp to communicate with his family. He owned the phone and desktop technologies. According to A, it was easier to communicate with family using these two platforms. He was not able to communicate with some family members using Facebook either because they did not have access, did not use it, rarely use it or hated technologies in general.

"…my siblings don't have Facebook. I mean, my brother doesn't have Facebook; my sister does but she doesn't use it that much. And I only communicate with my parents…I mean my father, he hates technologies, so I only communicate with my mother basically."

Since his father hated technologies, A communicated to him using his mother as a channel. He communicated with his mother mostly twice a week using Facebook messenger, and the content of communication mostly involves sending regards–greetings and checking on her wellbeing, his father's wellbeing, and the wellbeing of other family members.

4.8.1 ANT Mapping: ICT And Family

This ANT mapping represents A's engagement with ICTs in communicating with his family. This map is based on A's narratives.

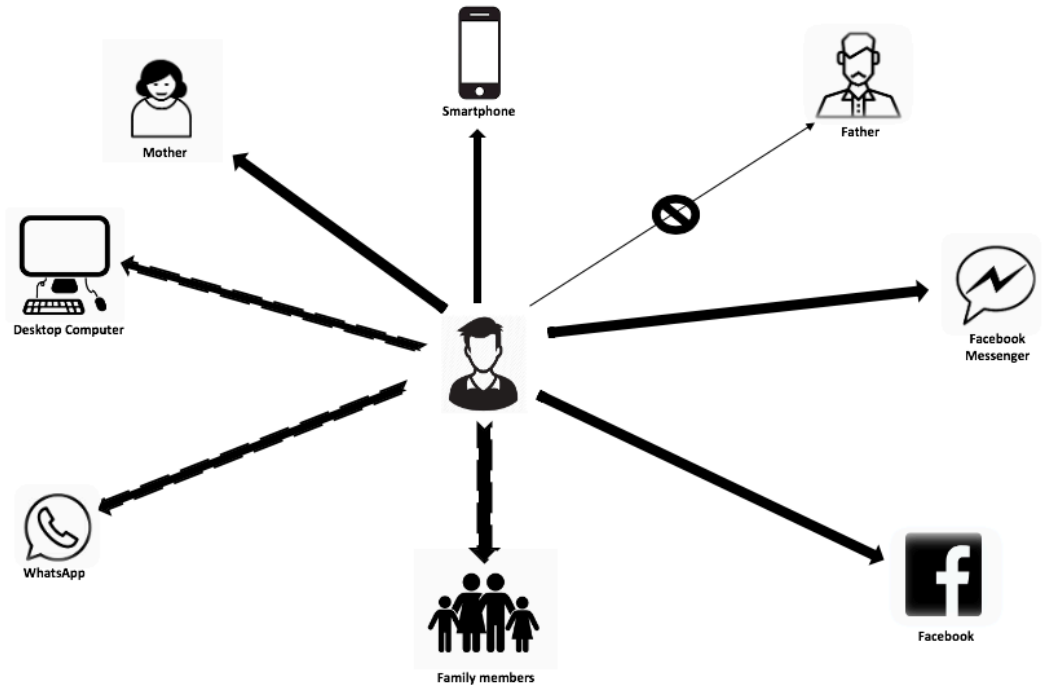

Figure 4.3: *ICTs and interaction with family*

4.8.2 Experience: Some Benefits and Challenges

A's use of social media to communicate with the family created stronger family bonds, connections, and ties.

"…so, I think these technologies have made me feel really really closer to my parents cause I have been out of town since I have been doing my undergrad and back then, we would only use text messages over a cell phone and phone calls and now we these technologies like social media specifically. Even my mom has said that she feels closer than before. I don't know if it is because you can send pictures and you can share pictures over social media but she has actually expressed that she feels more closer."

Social media was of great benefit to A and his family as it brought them closer. However, this was not without some challenges. On his part, A struggled and often got frustrated with not being able to respond to messages on time, and still struggled with a strategy to set notifications on his smartphone in order to help him quickly respond to messages. Meanwhile, on the part of his family, his mother to be specific, was not familiar with the technology as she was new to Facebook and did not have much agency with the application's usage as it was A who created the account for her and she merely used the technology based on A's guidance. His mother faced many challenges in solving simple daily problems like password confirmation and software updates but she sometimes chose not to tell him for concern of bothering him.

"…Oh yeah! My mom. She is new to this technology and she has been it for a year now. At the beginning it was challenging in the sense that, for example, something happened to her phone and she didn't know how to fix it. For example, things that have to do with updating the software of the phone. One time, she couldn't use Facebook because she needed to put the password again into her account. Actually, all the accounts that she has I created them for her. So, she doesn't

have that much agency on this software so she depends on me. Sometimes, she doesn't want to bother me so she doesn't tell me anything until I visit her. That's when I notice that she had an issue with the software."

With Facebook and WhatsApp being the two technology platforms that A used to communicate with family, he valued the simplicity of the Facebook messenger interface design and the minimalistic design interface of WhatsApp.

On the flip side, A disliked Facebook's frequent suggestions for a status update as it was annoying. Also, A disliked WhatsApp's background because of the multiple background images created distractions.

"… I don't like being nagged about uploading photos and updating my status. I don't know what you call all that uploading like a video and all that. I hate it…. WhatsApp could offer you some themes; ones that are more simple. I don't like the background of WhatsApp. You know, all of these images that it has. Something that's distracting a little bit."

4.9 ICT and Friends

A's friends live in El Paso, Guadalajara, and Chihuahua. He communicated with them using only Facebook technology, on his smartphone and desktop computer. Nevertheless, with his friends in Juarez, he mostly made use of face–to–face communication. He communicated more with family than with friends. He communication with friends on Facebook was initiated via liking and commenting on each other's' posts on Facebook. This communication was often initiated by a common interest in taste and likes–of events, news, subjects–with friends.

4.9.1 ANT Mapping: ICT and Friends

This ANT mapping represents A's engagement with ICTs in communicating with his friends. This map is based on Tee's narratives.

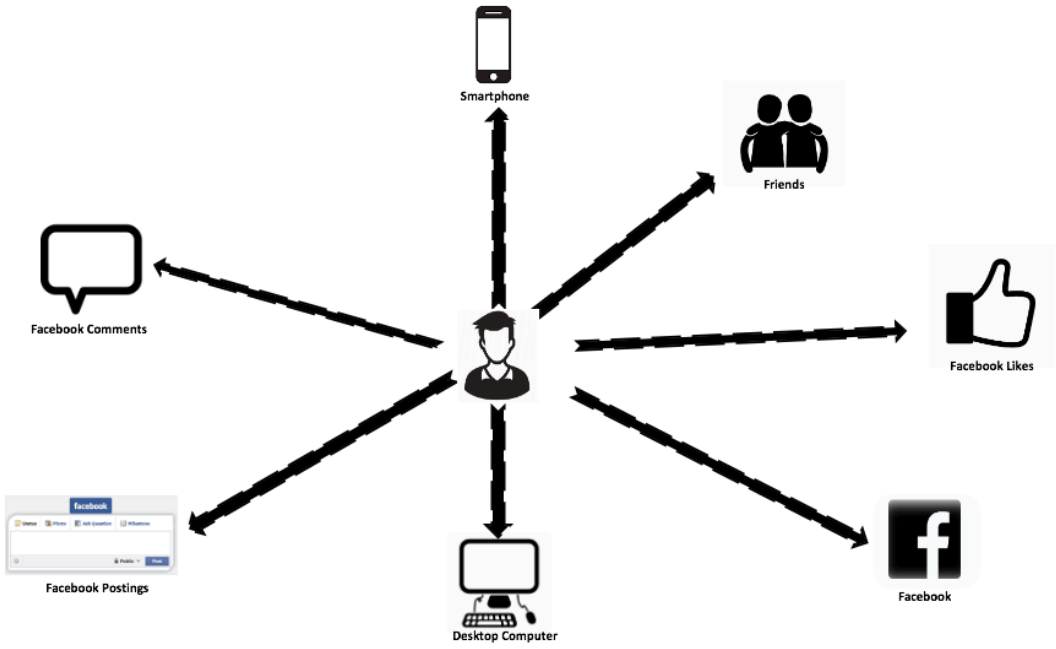

Figure 4.4: *Engaging ICTs with friends*

4.9.2 Experience: Some Benefits and Challenges

In communicating with friends using Facebook and on aspects that they had in common, A indicated that it became a challenge and as well as a benefit with navigating communication with friends as he discovered the "true self" of his friends. The communication revealed a lot about his friends that he might not have discovered before the coming of Facebook.

"…one of the challenges of Facebook, specifically, in communicating with friends is that you don't see your friends the same way you used to see them before Facebook….. you get to know your

friends in settings that you wouldn't have imagined before. For example, talking about feminism, homophobia, talking about politics, and the challenges has been to be tolerant of their points of view…. So, I got to learn that some of my friends are homophobic, for example, and it's been challenging to see that in terms of tolerance which is ironic because one would have been tolerant with someone who is not tolerant. I try to see this not in terms of paternalistic ways but in terms that they still need to learn something about social interaction or social communication…".

A added that some of the benefits of using Facebook to communicate with friends were that it helped him to keep in touch with things that he liked such as music and politics, and also helped some friends become more progressive with their interaction and views about other people or groups of people.

4.10 ICT and Job

"…I was not exactly planning on doing a doctoral degree. I got here because I was following my wife. She wanted to study here, get a graduate degree and I decided to look into some of the programs that were offered. So, I didn't have any expectations on teaching here at UTEP, an American university"

A enrolled in the graduate program in the USA as a result of his wife's interest in graduate school. He never expected to teach in an American University. He worked as a graduate teaching instructor and had no other job outside teaching. When performing his job, he engaged technology using the institution's computer, projector, and speakers–all available in the classrooms– and as well as his smartphone. He used his smartphone mainly to remember the names of students he taught. Blackboard is the central learning management system of the institution, and A used it to access

and make available teaching materials to students. Blackboard also provided the benefit of having materials in one place and enabled students have access to those materials.

4.10.1 ANT Mapping: ICT and Job

This ANT mapping represents A's engagement with ICTs at his workplace. This map is based on A's narratives.

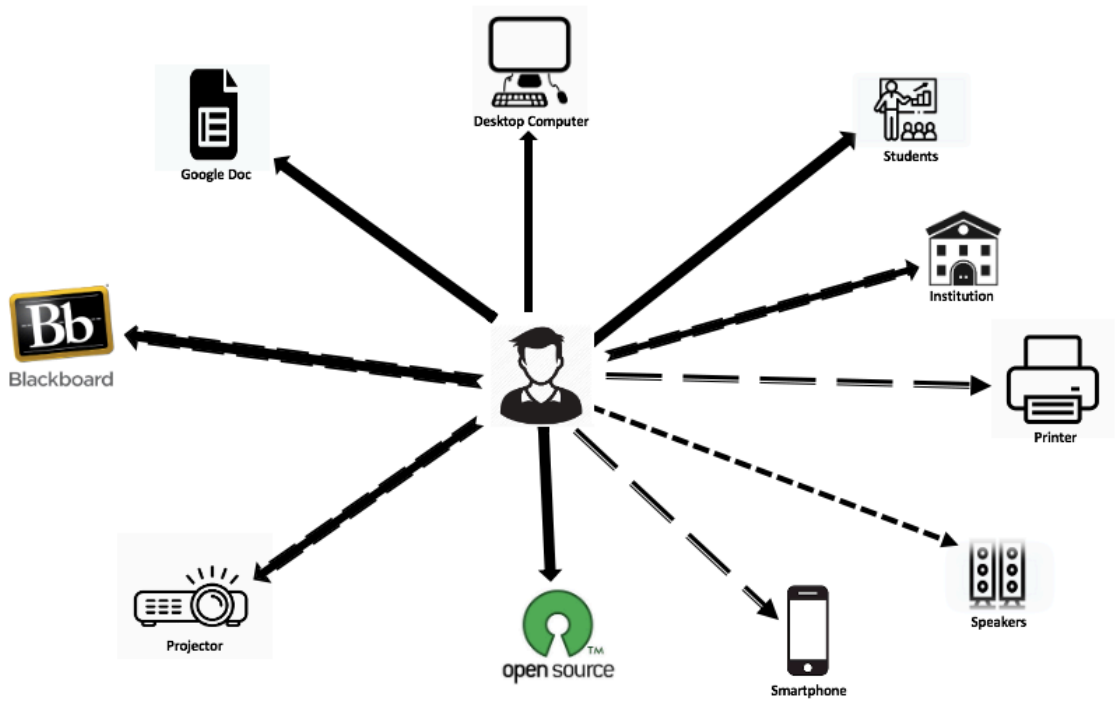

Figure 4.5: *Engaging different ICTs at job*

4.10.2 Experience: Some Benefits and Challenges

A is a fan of open–source software and did use the open–source versions of PowerPoint presentation, Microsoft project, and other open–source software to facilitate his teaching. Music

is also an essential part of his teaching. All of these technologies, whether hardware or software, aided his teaching in both visual and aural modes.

"…the benefits of these technologies definitely is to be able to use visual aids, aural (oral) aids. So, that is definitely a plus because one of the things that I struggle with or that I pay attention to is student motivation. In that sense, you know, making the classes more significant, more enjoyable and more easy to relate to and to remember…."

Despite the benefits of using Blackboard in teaching, A identified specific challenges that he faced with using this technology. According to A, Blackboard was not intuitive, and this made it very difficult to know many features of the technology. Thus, it became very time–consuming to research in order to identify the different features that the technology offered.

A's teaching job entailed that he used Blackboard as the primary technology in teaching. He could use other technologies like Google Docs, but Blackboard was non–negotiable according to the University's course delivery policies. A's lack of awareness in certain features of Blackboard was not because he got exposed to the technology only after enrolling in graduate school in the USA but rather because he had limited use of the technology as a teacher in Mexico. He used Blackboard technology as a teacher in Mexico just for meeting purposes

"… this is interesting because, probably, the company which is one of the biggest English schools in Mexico used Blackboard but only to communicate… we used to have meetings through Blackboard. So, we had meetings using chats, using audio, using slides presentations through Blackboard"

Thus, his use of Blackboard in Mexico had significantly affected the way he used technology in the USA. This was in part because of his limited use of the technology back in Mexico, and the

many features of the technology that he had not been exposed to-–it became overwhelming and somewhat confusing.

4.10.3 ICT and Design

A acknowledged that Blackboard had the potential of making teaching accessible remotely with all the features available. However, because of the design and user interface of the technology, it made it difficult to use the very many features and thus underused. He described the design and user interface as "user inhospitable."

"…But one thing that I don't like about Blackboard, even in the looks, in the design of it, is that it's so so user inhospitable… It's so daunting; the features don't make any sense. For example, in basic things like choosing what is gonna be the landing page."

A argued his reason for describing the technology as user inhospitable because the configuration settings were not very clear, the design was awful, and templates were very colorful and thus created distractions.

4.11 ICT and Other Social Interactions

Beside using technology to study, teach and work, A also engaged several technologies in other social interactions. Some of which included his smartphone, Google maps for direction, Netflix for entertainment, and torrents for downloading movies and software. A made heavy use of torrents in downloading videos and software for both recreational and academic purposes. He acknowledged that using torrents to download was illegal in Mexico, but he took advantage of the grey areas

"...you know in Mexico, there are some grey areas that you can do that. So, I use that a lot, too, I confess. But the good thing about that is that I also use it for academic purposes not only for recreational ones."

The reason he downloaded movies and software using torrents was that he did not like to watch movies via websites and also because he saved money as they were free. Torrent download is a big part of A's life, and he used it to explore and find software that matched his needs. He also used the torrent to download books and music for recreational purposes. He owned all the technologies he used in navigating his social life.

4.11.1 ANT Mapping: ICT and Other Social Interactions

This ANT mapping represents A's engagement with ICTs in different social contexts other than communicating with family and friends. This map is based on A's narratives.

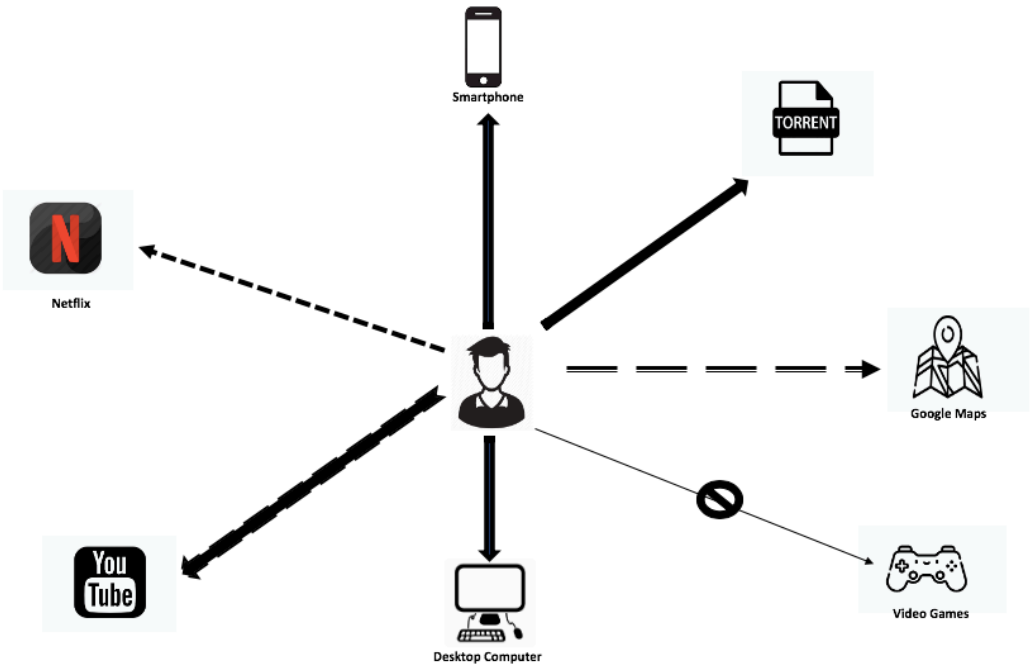

Figure 4.6: *Using ICTs in other social interactions*

4.11.2 Experience: Some Benefits and Challenges

Technology was very beneficial in A's social life as he used the internet to access information, to explore multiple perspectives on a topic from different internet sources, using videos on YouTube as an alternative to standard text, and as well as for both the social and academic purposes. Despite the benefits of engaging these technologies in his social life, A indicated that there existed particular challenges as well.

Some of the challenges included the fact that using technology in social life could become addictive and very time consuming as a result. Thus, a way he resorted to fighting these challenges is to have limited use of specific technologies and the complete avoidance of certain technologies, like video games. He considered those technologies as less productive and very time–consuming. *"...one thing that I have stopped doing, I used to do that when I was younger, is playing video games and to me now, they are just a waste of time. So, I try to avoid that because I think they take a lot of your time and you don't get anything useful out of that."*

4.12 Conclusion

A's exposure to ICTs peaked during his undergraduate level as he significantly engaged technologies to conduct his academic research. His experience with working in an IT department in a supermarket and a computer assembly line and his brother's knowledge in computers are all credited with his computer literacy skills, as this helped prepare him for engaging ICTs in graduate school in the USA. In terms of engaging these ICTs, A mostly used his desktop computer, smartphone, Kindle, open–source technologies, Google Docs, and Microsoft PowerPoint in an academic setting. In terms of communicating with family, Facebook was the primary technology he engaged in.

Communication with friends was mostly done using his smartphone and desktop computer via Facebook, Facebook messenger, Facebook status, and Facebook comments. At his job site, Google Docs and Microsoft PowerPoint–using a desktop computer-– constituted the most frequently used technologies. Meanwhile, his love for downloading, using torrents, on his desktop computer, and using his smartphone comprised his primacy ICTs in his other social interactions– other than his family and friends. Using these technologies and using them at full capacity significantly depends on the design.

A was very concerned with the design of Blackboard and described the LMS as "user inhospitable" because of unclear configuration settings, awful design, and very colorful templates that created distractions. Despite the design concerns of Blackboard and other technologies, A particularly valued the simplicity of Facebook messenger interface design and the minimalistic interface design of WhatsApp technology. A indicated that using technology can be challenging as it may become addictive, especially in a social context. However, he also acknowledged that technology had been, overall, beneficial as it provided access to information, acted as aids in teaching and learning, and as well as created strong family bonds, connections, and ties.

Chapter 5: Digital Sunset in the East

This chapter focused on the narratives of a transnational student from an Asian continent. I addressed what I meant by digital sun setting in the east. The main component of this chapter focused on the ICTs literacy narratives, interpretations and analysis of a transnational student from Asia.

5.1 Country Background: Nepal

Nepal is a small country found in South Asia. The mention of the name Nepal most immediately invites the idea of mountains, as it is famous for being the land of mountains, with a record of having eight of top 10 highest mountains in the world. Having the highest mountain above sea level (Mount Everest) and most extended mountain range (Himalayas) in the world, the country has a population of 29.3 million people. According to the World Factbook (2015), Nepal's economy depends on exports that relate to agriculture, carpets, jute products, and clothing and most notably, more than 70% of Nepal's population depend on agriculture as a source of economy. The 2017 GDP growth rate was 7.5% (World Bank). The country's reliance on agriculture for economic survival has not stopped them from initiating and incorporating ICTs in both the public and private sectors. This is backed by the Telecommunications Act of 2053 (1997), the Telecommunications Regulation of 2054 (1997) and the Information Technology Policy of 2057 (2000) which created a space for private sector participation in the Information Technology development. Although these policies and regulations did not improve the ICT development of Nepal because of limitations imposed during the country's decade–long "People/s War," instability and the endemic corruption at governmental levels , the country took a significant turn by devising the Information Communication Policy number 2072.

The policy aimed to address the need for a well–defined and consistent policy and regulatory framework for addressing converged regimes of telecommunication, broadcasting, and ICT. According to Aashis Sharma (2016), ICT policy in Nepal has been relatively restrictive and centralized but the World Bank's global turn of privatization and autonomous regulation is the primary reason behind most of the policy devising and changes (p.106). Sharma adds that the overall ICT development of Nepal is not considered satisfactory as the country still lacks minimum ICT infrastructure throughout the country (p.115). In contrast, the telecommunication sector has grown faster when compared to other technology services (p.115). Like many developing countries, Nepal faces some challenges and problems of ICT development such as slow Internet, expensive Internet access costs, lack of ICT infrastructures, and lack of an enabling environment to promote ICT development.

5.2 Participant Background

Bee is from Nepal and has been enrolled in the doctoral program in Rhetoric and Writing for four years (at the time of research). His age is in the range of 41–50 years, and he speaks/writes using two languages: Nepali and English. For academic purposes, he uses the English Language. Meanwhile, he uses both English and Nepali to communicate with family and friends and to also engage his daily social life. He enjoys teaching, teacher training and researching. His research interests are in the areas of xxx and he teaching xxx classes at the university in which he is enrolled.

5.3 ICT Background

Before coming to the USA, Bee mostly used PowerPoint technology to teach– he was previously a teacher in Nepal. He also used his laptop for personal, training, and academic purposes and as well as his smartphone to listen to BBC radio and other local Nepalese programs. Bee

considers ICT to be any scientific knowledge or tool used in facilitating human communication. Bee engages different technologies to communicate with family and friends, as well as colleagues. He communicated with family using phone calls—especially with mum and sister; communicated with his wife using email and Skype; and communicated with friends using Viber, phone calls, and emailing either using Gmail or Yahoo Mail.

5.4 ICT: Nepal Versus USA

Bee had limited exposure to certain technologies before embarking on his graduate journey in the USA. In the USA, he was required to use technology–both as a student and a teacher– that he either had very minimal or no knowledge about. For example, he was required to create documentary films, brochures, PSA, and infographics, but he was never taught how to create these technology–driven projects. He described his experience as daunting, overwhelming, horrible, and bad.

"...ehh right, in the beginning ehh it was somehow overwhelming, daunting experience especially when it came to using technology in the classroom because I was required to use something that I did not know anything about ... so asking me to do something that I did not know, that they did not teach me ....was certainly a very horrible thing for, you know, it was a very bad experience indeed."

While in Nepal, he made use of his mobile phone and laptop. Still, although technology usage in Nepal is on the rise, he acknowledged that there existed a massive gap in the technological infrastructure and usage between Nepal and the USA.

Bee was not a stranger to some technologies such as emailing, telephone, Viber, and Skyping. He was entirely new to technologies such as Google Docs, Dropbox, audio recorder and

hard disc used in research. He also acknowledged that using these technologies in Nepal was optional, but in the USA, it was not optional.

5.5 ICT Ownership and Usage

Bee owned an iPhone and a Mac laptop, and he credited this to the institution for providing the means; as he could not have afforded this as a teacher in Nepal.

"...in my country, like a teacher or a professor teaching the public funded university is unlikely to buy such expensive devices like MAC or iPhone because they cannot afford to buy them...their salary is so meager, so poor that they can't even think of buying them ...so when I came here , i was avail of that opportunity UTEP funded me for my doctoral program... so that is why I am still grateful to UTEP."

Bee did not only make use of the technologies he owned. He also used other technologies to study and teach. Some of these included classroom computers, printer, projector, and transcriptions software. Bee had a desktop computer and a printer in his office–provided by the institution–but did not make use of them because he considered his laptop to be more convenient and safer to use.

Also, he lacked the proper knowledge in transferring files from his personal computer to the office computer. Bee did not make use of his office computer, but that was not the same case with the classroom technologies. Bee made heavy use of classroom projectors in his teachings as every classroom was equipped with the technology. He wished he could own a personal projector but lamented that it was costly.

5.6 ANT Mapping

I used maps to project the different technologies that he engaged, the different areas of engagement and the frequency of his engagement of these technologies in his life. The maps are based on the key below.

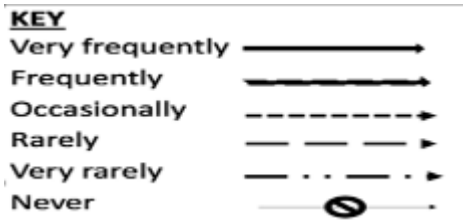

Figure 5.1: Mapping Key

5.7 ICT and Academic Use

Bee engaged different technologies in his academic life as a teacher and student. Some of these technologies included a laptop, mobile phone, Blackboard, Microsoft Office, Webster app, oxford app, internet, databases such as ProQuest, EBSCOhost, Jstor, and free book downloading software such as bookfi.net. Bee did most of his academic work with the help of Microsoft Office. Still, he often preferred to convert his document into pdf files as he considered information very pleasing and easy to read in pdf formats.

Screenshots and images also formed a core part of Bee's graduate studies materials. As a teacher, Bee could not execute his job without using technology. When teaching, Bee used a laptop and projector to display PowerPoint slides and to play lecture videos, and mobile phone to search for meanings of words to clarify a possible confusion. Also, he used the internet in class to help students with their research in finding sources from databases for literature review by walking them step by step throughout the process. There is always bound to be certain technologies that one uses more than others. Bee's case was no different.

"…YouTube is what I make most use of….for example, when i teach literature review....i always go to YouTube…, I do email my students quite a lot, I use the same email address that we have in Blackboard…"

He used YouTube and emailing significantly in teaching and connecting with his students. Also, other technologies that he made substantial use of in teaching students included TED talks, documentary films, online images, projectors, a laptop, a mobile phone, and speakers in the classroom. Bee used Google Docs only for his studies and not to teach students.

5.7.1 ANT Mapping: ICT and Academic Use

This ANT mapping represents Bee's engagement with ICTs in fulfilling his academic commitments. This map is based on Bee's narratives.

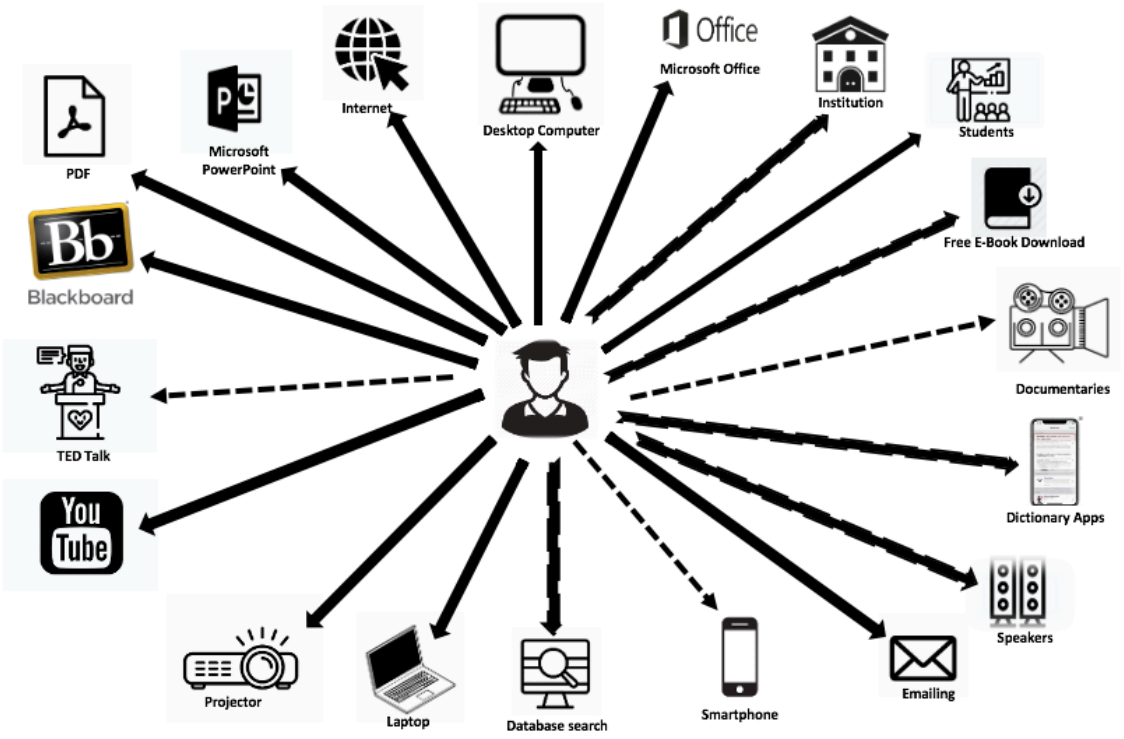

Figure 5.2: *Engaging different ICTs in academic setting*

5.7.2 Experience: Some Benefits and Challenges

Despite his difficulties with engaging these technologies in his academic life, Bee acknowledged that it was a learning process for him, and he was somewhat comfortable with using the technologies now as compared to his early days in the program.

"...frankly speaking, I feel very much better now than what I felt when I first came here.....these things, you know, if I had been in Nepal, I wouldn't have been able to do...there is a progress definitely ..there is a progress I am feeling much happier ..but that is enough, that is what I feel,.."

Although he was not prepared to use these technologies, he described his experiences as being progressive and much happier. Bee expressed the feeling of product pride when he and his students used technology successfully. He even indicated that he could conduct technology–driven projects, such as documentaries and E–portfolio, from sites such as weebly.com, wix.com, and Google Sites.

Bee identified product–focused teaching, using technology, as a significant challenge. He considered technology problematic when teaching focused more on the final product and not the process.

"...we are actually, for example, interested in product rather than process ..right.. teachers just want the students to have the final product , how they did this ok...what, how they supported to produce that work is not very much...taken care of.."

He also questioned the rationale for using technology in doing certain mandatory assignments as he feels things are prescribed rather than rationalized.

"...one of the things troubling me even today is the rationale behind the use of video film, for e.g., in rhetoric and composition class...you can't simply say because rhetoric or things that are multimodal. Everything is multimodal but what is the disciplinary exigence , for e.g., ..right., what

is the area scope of rhetoric and composition ?...didn't it allow us to understand things without the use of technology for e.g...we have been using words for ages ..right…these are some of the questions still hunting me that might be one reason why i am not able to progress as much I could have...I would like to have the rationalization"

Narrating his experience as a teacher for over 20 years and indicating that without rationalizing assignments, he ascertained that it was not easy for students to be interested in learning from those assignments. He expressed frustrations at not getting answers to his critical questions on the rationale of incorporating technology in certain students' projects/assignments.

5.7.3 ICT and Design

Bee expressed general satisfaction with the design of Blackboard but declared frustration with the tendency to get error messages when a request is made by clicking available options. He identified a problem he experienced with the grading system.

"..I had problems twice ehh BB showed every assignment I have been teaching so far ..and..so when I had to grade..there is so many assignments ..right..I don't know how it happened and that was a little troublesome for me...."

He always resorted to seeking help from the university tech support when he experienced problems with Blackboard. Explaining that he used Blackboard "well" to teach and communicate with his students but added that he would not use the word "efficient" in describing his experience. He indicated that it met the course or program expectations and, thus, his expectations.

5.8 ICT And Family

Bee's family is located in Nepal, except his son, who is in Dallas, Texas. He communicated with family using different modes of communication, either with his smartphone or laptop, depending on availability and accessibility. He communicated with his wife and son using phone calls and text messages, Skype calls, and also Viber app for calling and texting. Also, he communicated with his wife frequently via email. Bee occasionally communicated with his mother, brothers, and other family members using regular phone calls because they did not have access to the internet, and regular phone calls were costly.

5.8.1 ANT Mapping: ICT and Family

This ANT mapping represents Bee's engagement with ICTs in communicating with his family. This map is based on Bee's narratives.

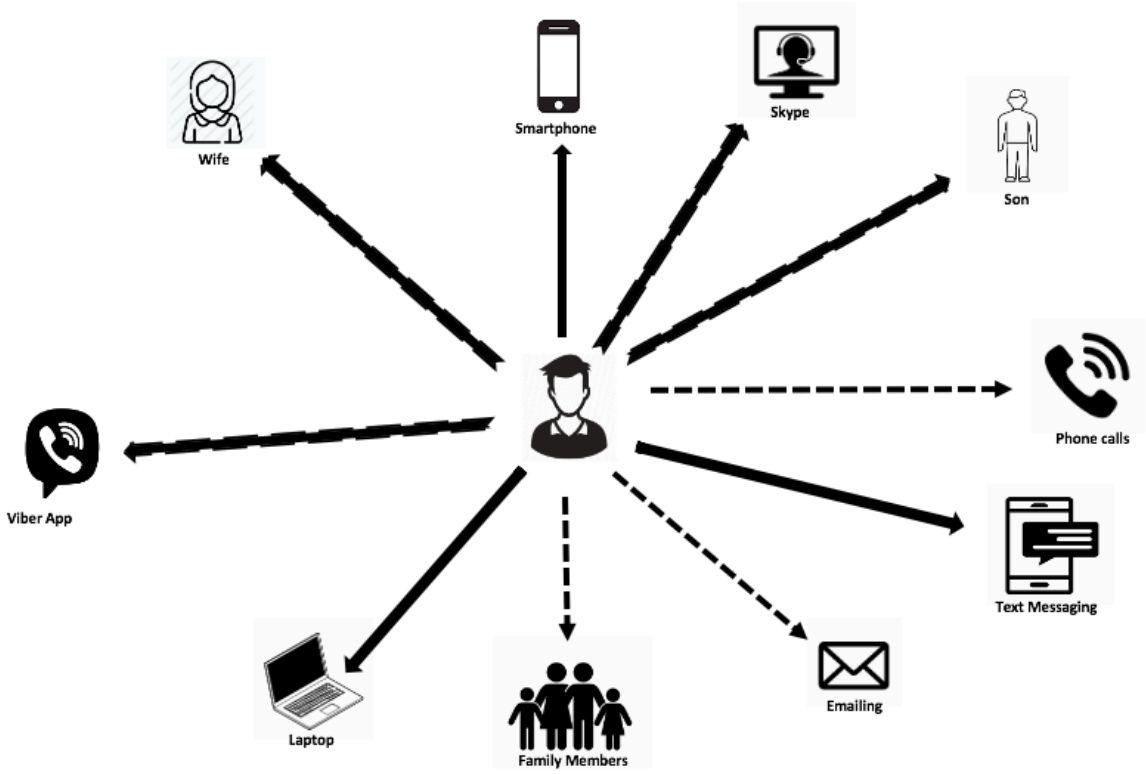

Figure 5.3: *ICTs and interaction with family*

5.8.2 Experience: Some Benefits and Challenges

ICT was of great benefit to Bee, especially with communicating with family.

"...you are always in contact with your family , you know, how they are doing, you know, at a distance ..right.. if they have any problems and we can instantly address it so ehh,... like if they have any problem and if they need some money, and if I am in a position to help, I can send that through money transfer..."

Bee appreciated the fact that he could always be in touch with his family to check on their wellbeing and to intervene in different aspects when needed, especially during emergencies.

Even though Bee enjoyed the benefits of using ICTs to communicate with family, he also experienced some challenges. He stated that phone calls were costly to communicate with family members who did not have access to the internet; family members may not be available to answer phone calls as they often left their phones at home before going to work, and; the difference in time zone was a big challenge to communication because it impeded instant communication.

5.8.3 ICT and Design

A technology that Bee enjoyed using in communicating with family was his iPhone. His love for the device was captured by its sophisticated looks, aesthetic pleasure, more application options, and a sense of social identity.

"…it looks sophisticated… it gives you aesthetic pleasure ..right…and it also has it's image ,… many at times, what we as customers want is also the image,… iPhone gives you certain kind of social distinct identity depending upon which society you live in…right… phone is good and there are many applications like ehh you can listen to CNN, any any all FM , you know, all FM radios and then you have lots of applications"

On the flip side of Bee's love of the device, he expressed frustrations with the fact that the iPhone was very expensive and also that the internet providers made connection problematic.

5.9 ICT And Friends

Bee's friends are located around the world with some in the USA, Canada, Australia, and Europe. He communicated with his friends using similar modes of communication that he used with his

son and wife—cell phones, Skype, Viber, Facetime, using his smartphone and laptop. He decided the mode of communication–based on the communication needs and situation—context.

5.9.1 ANT MAPPING: ICT AND FRIENDS

This ANT mapping represents Bee's engagement with ICTs in communicating with his friends. This map is based on Bee's narratives.

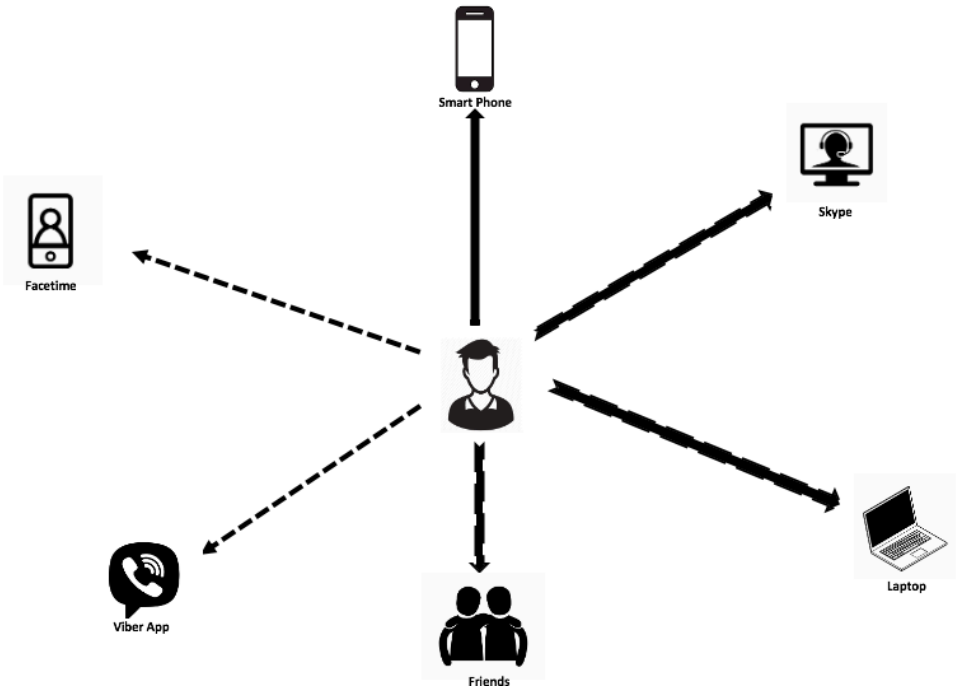

Figure 5.4: *Engaging ICTs with friends*

5.9.2 Experience: Some Benefits and Challenges

Communication with friends was of benefit to Bee as it acted as a way of informing and be informed of the latest information in his academic discipline on areas such as information on conference presentations, call for papers, and publishing updates.

On the other hand, a challenge with using these technologies to communicate with friends had to do with various internet network and phone call interruptions due to poor or no connection. Privacy was also a big challenge for Bee as he was very concerned with communicating and sharing information using these ICTs.

"…one of the, you know, greatest problem with ehh the use of communication technologies is that, you know, you feel like your privacy in cost, you might like to talk about your private things, on Skype, for example, and I hear that, you know, like for example Facebook one, I used to use Facebook earlier right, and I wanted to erase Facebook , not deactivate again , I mean alone(not clear), I wanted to erase my Facebook account ...but I am not able, I don't know if there is any way to erase that.…there is there is this evidence that I once used Facebook , for e.g., right, ..so such things , you know, ehh and sometimes like people can tap your telephone , they can tap your voice ..we are talking right now and this is this ehh one of the greatest dangers of using communication , I guess…"

5.10 ICT and Job

Teaching was Bee's only job, and he engaged different ICTs in navigating his job. The ICTs he used at his job included a desktop computer, projector, printer, laptops, PowerPoint, YouTube videos, Vimeo, documentary films, short recorded radio programs/podcasts, and Blackboard learning management system. He mostly used his computer at his job site.

Bee used PowerPoint as a significant lecture technology. He developed the slides at home, sent them to his email, and accessed and used it for teaching. This access was done using classroom computers, projectors, speakers, and other available classroom technology teaching aid.

5.10.1 ANT Mapping: ICT and Job

This ANT mapping represents Bee's engagement with ICTs at his workplace. This map is based on Bee's narratives.

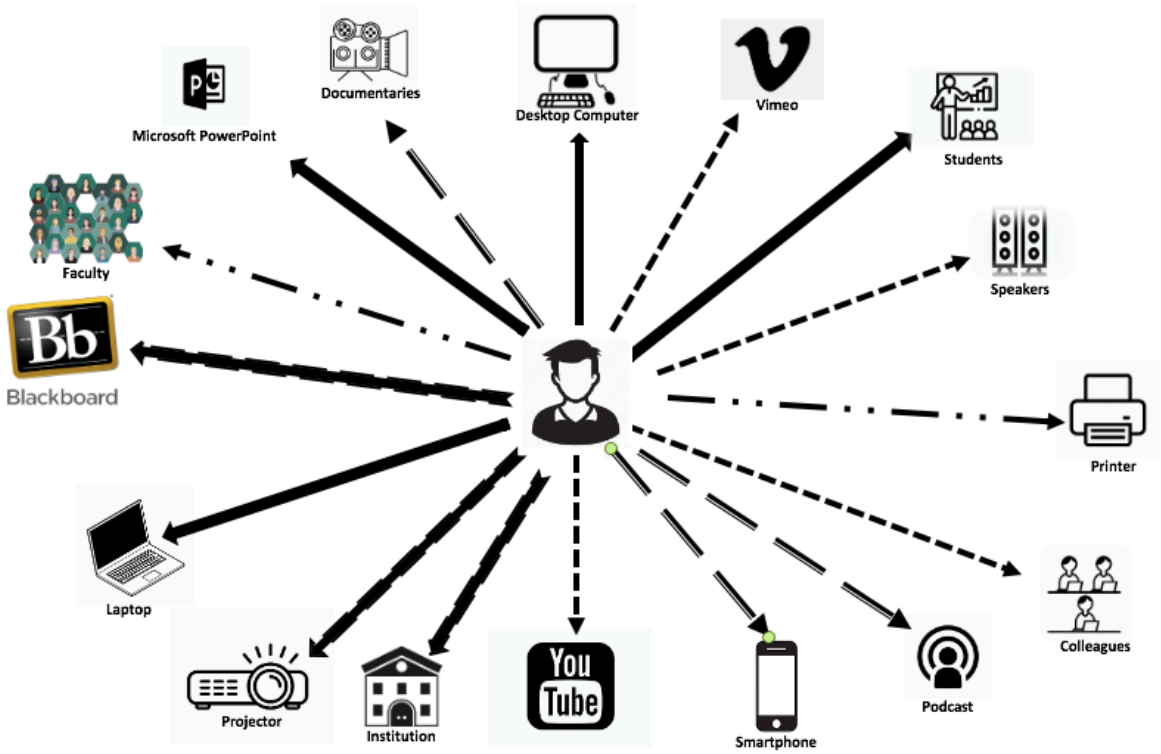

Figure 5.5: *Engaging different ICTs at job*

5.10.2 Experience: Some Benefits and Challenges

Bee believed that PowerPoint presentations were crucial for students to stay engaged and to be productive in class.

"…your students might be bored to death listening to lecture from beginning to end. We have a class that lasts for about one hour and twenty minutes, for example…. technology helps us to involve and engage our students….They love to listen, to watch something. So, I find use of technology more engaging, more entertaining, more informative."

Bee posited that technology helped him remember what he planned to teach as there were possibilities that he could have forgotten some things. Also, technology's educative and entertaining capacity helped in getting students involved, informed, and engaged in their learning in classrooms.

"...suppose I am gonna teach a particular topic, so if I am in a class without any teaching aid like technology PowerPoint, for example, I might forget certain things. But if it is there on PowerPoint, I can use this and this possibility that I won't be missing any point. So that is helpful for the students."

On the other hand, teaching with technology had negatively impacted his teaching as he was not used to teaching with technology back home in Nepal.

"...in my country, I did not use technology as often as I do here in the US. So, what has happened to me now is that I am kind of handicapped. So, if I don't have, for example, PowerPoint for today's class, I become so handicapped that I need those pieces of information on the slides."

Bee added that students also faced many difficulties in learning without technology, and this had significantly affected their fluency in talking about different ideas.

"...If I ask my students to talk on their topic for one minute, they find it very difficult. They have to look back to their thing on the screen. They cannot talk. So, this use of technology has in a way interrupted their fluency. They cannot really talk on their own without technological aids."

5.10.3 ICT and Design

A technology that Bee engaged with his teaching, aside from the classroom computer, was the projector. According to Bee, the projector generated clear and distinct images as well a soothing sound quality to the ears.

Because of Bee's little knowledge in classroom technologies and his little exposure to just one kind of classroom technology, he acknowledged that he did not have the capital to evaluate the design of such technologies–in terms of efficiency and effectiveness.

"…if I had been exposed to other forms of technology used in the classroom, maybe, I would have been in a better position to compare and contrast and suggest something. So, since I have just used one form of technology, be it computer, projector or software technology like Blackboard, that's the only thing I have used. So, whatever I have used sounds good to me."

5.11 ICT and Other Social Interactions

Bee used different technologies in navigating other social contexts other than friends. Some of these technologies included using credit and debit cards, Apple Pay, mobile phone, laptop, Netflix, YouTube, radio apps such as NPR, BBC, CNN, Fox News, WNYC, and TuneIn, and podcast.

5.11.1 ANT Mapping: ICT and Other Social Interactions

This ANT mapping represents Bee's engagement with ICTs in different social contexts other than communicating with family and friends. This map is based on Bee's narratives.

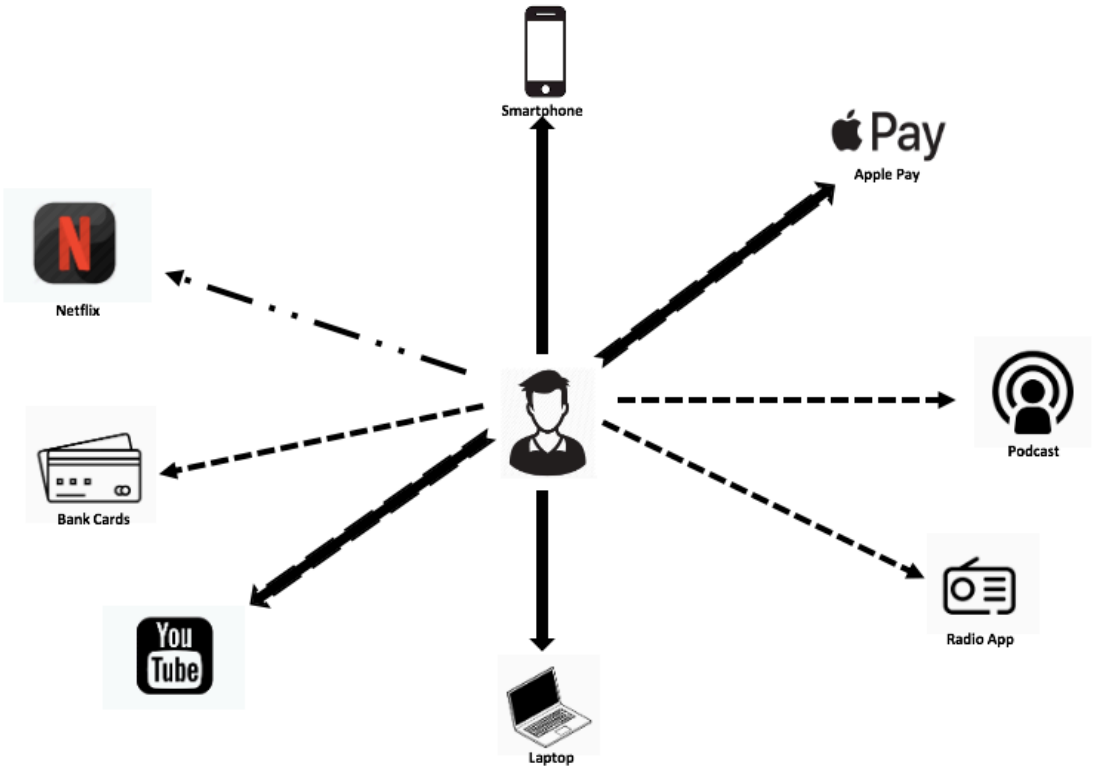

Figure 5.6: *Using ICTs in other social contexts*

5.11.2 Experience: Some Benefits and Challenges

Bee declared that using these technologies made life easy, convenient, and provided benefits in the form of credit card rewards and Apple Pay store rewards programs.

"…It's so easy and convenient, firstly. For example, if you want to buy a book in my country, Nepal, you literally need to have cash; you have to go to the bookstore and see if the book is available or not… But here, buying books through Apple pay or buying other things through Apple pay is much easier and more convenient. If you use these applications there are certain types of benefits like rewards."

He added that his experiences with using technology in Nepal were time consuming, inconvenient, and complicated, but the experience in the USA was quite the opposite.

Even though technology was significantly positive to his social life in the USA, the experience was not all merry as he had tense encounters trying to navigate public transportation technologies.

"…I didn't know how to get into a bus, for example. I think I had some cash with me. I just entered when the buses stopped and I gave the driver the cash and the driver is staring at me. He wasn't happy with me and I gave him money and said "Where is your ticket?" "I don't know where you get the ticket." I said. "Didn't you see there?" he pointed to the bus stop where you could buy the ticket. "I am new to this place, sir. I don't know how to even buy the ticket electronically." He was so angry. For newcomers like me, I think there should be somebody to teach you before you expect them to do the task."

Although this was a tense moment, it also became a learning and eye–opening moment about the level of engagement of technology in his new home.

5.12 Conclusion

Unlike Tee and A, Bee did not have any significant exposure to technologies before his journey to graduate school in the USA. He described his beginning experiences with using technologies in the USA as overwhelming and daunting. Nevertheless, this did not stop him from engaging ICTs in different areas of his academic and non–academic life. In his academic setting, he was very active in using certain technologies very often in his teaching and studying. The technologies included Blackboard, PDFs, Microsoft PowerPoint, internet, desktop computer, Microsoft Office, emailing, laptop, projector, and YouTube. With communicating with family members, he mostly made use of his smartphone, laptop, and text messaging.

Meanwhile, communication with his friends mostly involved the use of his smartphone. Microsoft PowerPoint, desktop computer, and laptop were the three most frequently used technologies at his job. In engaging other social contexts, Bee used his smartphone and laptop the most. In terms of the design of technologies, Bee was not satisfied with Blackboard as he described it as tending to give an error message upon request. However, he was very impressed with his iPhone design as he described it as being sophisticated, aesthetically pleasing, and creating a sense of social identity. These technologies also come with challenges and as well as benefits. Bee identified the challenge of using technology to teach as hurting his teaching–he taught in his home country for over 20 years without the use of technology. Despite this challenge, Bee acknowledged that it helped him remember what he had to teach, and technology also helped engage students in the learning process in classrooms.

Chapter 6: The Nitty–Gritty of ICT Practices

6.1 Overview

This chapter examined the findings of all the chapters and identified important insights from the narratives/experiences to suggest and recommend ways of understanding the Information Communication Technologies (ICTs) and their relationship to transnational students' literate lives. The findings were based on four research questions that informed the study. The research questions included: How and for what purposes do transnational students negotiate new ICT literacy or multiliteracies practices and events in their bifocal realities? What influences the ICT choices of transnational students in their bifocal realities? How can transnational students' digital literate practices impact the mainstream beliefs of ICT choices and uses in different contexts? And, how can transnational students' literate practices and experiences influence the ways technology industries design and develop ICTs in a globalized society?

This chapter also provided suggestions and recommendations for industry–in relations to understanding the ICT practices of transnational students in order to design, produce and provide ICT technologies that incorporate the experiences and worlds of transnational students– and also to academy in regards to the assumptions and realities of these group of students in engaging ICTs in their quest for higher education. The chapter also highlighted the limitations of the study and as well as contributions to conversations around the lives and experiences of transnational students with engaging ICTs. Just like many research studies, the chapter concluded by identifying gaps that future research projects could explore.

6.2 Research Direction

This study examined transnational students' experiences with the use of ICTs in their academic and non–academic lives in their quest for higher education in a specific disciplinary

program and at a specific university. They were PhD students in the Rhetoric and Writing studies program at a mid–size research 1 institution on the US– Mexico border. They had a dual responsibility in the graduate program; they studied and also taught undergraduate students. Thus, they were involved in teaching, administering examinations, and as well as grading. Also, they had close ties with family and friends–both in their native country and in their current region–and thus communicated with them using different ICTs. We cannot forget that they moved around their new environment using technologies that facilitated these movements, such as Google Maps, Lyft, or UBER. Besides, to destress, they somewhat needed some form of entertainment such as Netflix, YouTube, and movies.

The study made use of Liza Potts' (2008) Actor–Network diagramming as a method to understand the different technologies and usage levels that the participants engaged in their quest for higher education. By mapping their experiences, the analysis unpacked some findings that are discussed in the next section.

6.3 Research Findings

The goal of most research is to uncover or understand an issue or a concern and subsequently provide possible ways to deal with those issues or concerns. In this research, the goal was to understand the ICT practices of transnational students in their quest for higher education in order to better inform academy and industry on factors that influence their choice of ICTs. This section provides a summary of the research findings based on the research questions.

1. How and for what purposes do transnational students negotiate new ICT literacy or multiliteracies practices and events in their bifocal realities?

Transnational students negotiated different ICTs literacy practices in their lives as students and instructors in their quest for higher education in the USA. These different ICT literacy practices were informed and influenced by the demands and needs of the different contexts and spaces in which they negotiated and navigated. This negotiation and navigation created temporary relationships with different actants at different times, depending on the needs and exigencies of the practices. In order to understand the ways and reasons why these transnational students negotiated the different ICT literacies, I used the following categories:

ICT and Academic Use

Transnational students engaged different ICTs to achieve specific tasks that may be required to be accomplished as students and as instructors. The intended goal and objective informed the choice of ICTs they used to achieve the tasks. For example, as a teacher, Tee often used Airplay and Apple TV to teach his students because these technologies made work easy as they enable screen sharing with a phone, iPad, and computer. A used his home desktop to do class assignments, planned his teaching lessons by uploading teaching materials, and also graded students' papers using Blackboard. Meanwhile, Bee used Google Docs only for his studies and not to teach students. They engaged these different digital literacy practices in order to accomplish their tasks and duties as students and to also fulfill their graduate instructor roles as teachers.

ICT and Family

Transnational students engaged different ICT practices in communicating and connecting with family through the use of technologies that mostly make use of the internet. The use of social media and other communication apps formed a core part of their communication with family. They

communicated with family in order to check on their wellbeing, to send financial assistance, to keep a close bond with them, and to support and be supported during times of need. For example, Tee communicated with his family using WhatsApp because it used low data and guaranteed functional connectivity. A communicated with family using mostly Facebook, on either his mobile phone or desktop computer, and he used it to schedule calling plans. On his part, Bee occasionally communicated with his mother, brothers, and other family members using regular phone calls because they do not have access to the internet, and calls are costly.

Although some transnational students engaged these ICTs before moving to the USA for higher education, their use and exploration of other ICTs to keep in touch with family intensified due to the distance created by their current environment.

ICT And Friends

Transnational students engaged new ICTs to communicate with friends using social media and trending communication applications that their friends had access to and often used. The technology literacy level of their friends influenced the choice of ICTs. For example, Tee has many friends around the world who are mostly tech–savvy, and he often communicated with them using WhatsApp group chats, as they could exchange over tens to hundreds of messages in a day. A communicated daily with his friends using only Facebook technology, on his smartphone and desktop computer, and the communication was initiated via liking and commenting on each other's posts on Facebook. Meanwhile, using his laptop and smartphone, Bee communicated with his friends using similar modes of communication that he used with his son and wife, such as cell phones, Skype, Viber, and Facetime.

They kept in touch with friends to know how they were faring and to get information on topics of common interest such as academic interest, cultural interest, political interest, and other

areas of common interests. This exposed them to different views and opinions on groups and events other than theirs.

ICT And Job

Transnational students engaged different ICTs in executing their duties as instructors based on the program requirements, the needs of the class, and the needs of the students. For example, they were required to use Blackboard technology as a learning management system and also to use the computers, speakers, and projectors, found in the classrooms, to teach. They could use PowerPoint, Google Docs, or TED talk to teach based on the needs of the classes while the students could design an E–portfolio using Wix.com, WordPress, or do a presentation using Microsoft PowerPoint or other presentation programs or applications. For the program requirement, the transnational students were required to obtain the necessary literacy skills, but for the other areas such as the needs of the class, they had to obtain the literacy skills based on whatever skills they deem necessary in facilitating their jobs as teachers. As for the students' needs, the instructors helped them make informed choices and decisions to enable them to stick to the class requirements and to meet the class expectations. For example, the research narratives revealed the following.

Tee usually uploaded course syllabi, created class plans on Blackboard and also used Google Docs and Outlook.com to facilitate his teachings. A used Blackboard to access and make available teaching materials to students while Bee used PowerPoint as a significant lecture technology as he developed the slides at home, sent them to his email, and accessed and used it for teaching in classrooms.

ICT And Other Social Interactions

Transnational students engaged different ICTs for transportation, direction, social awareness, and other recreational purposes using different ICTs that they, mostly, did not use in their home countries. They did not use those ICTs in their home countries either because it was not necessary (Google maps, for example) or their usage was not very common because they did not have the necessary technology infrastructure to support them (Apple Pay, for example). They mostly engaged these technologies to get information, to conduct financial transactions, and for entertainment, directions, and transportations.

2. What influences the ICT choices of transnational students in their bifocal realities?

The decision of which ICTs that transnational students engaged were based on the following;

– ***Cost and affordability***

Cost played a critical role in the choice of ICTs that transnational students engage in navigating their lives. Their immigration status as transnational students limited them from working outside the university campuses, and thus, restricted them to a very tight financial budget. As a result, they could not afford certain technologies because of the high prices and the fear of running low or out of finances. Based on the study, the participants do not receive any financial support from family or friends in their home countries.

– ***Availability***

Another factor that influenced the ICT choices of transnational students was the availability of certain technologies in their home countries. There were certain technologies they did not use in communicating with family or friends outside the USA because those technologies were not available to their families or friends outside their country of study. For example, some of the

participants indicated that they did not use Facetime or Google Hangout in communicating with family because the technology was not available in their home countries or the network did not support such technologies. Thus, they preferred to engage technologies that were available to them and their families or friends.

– ***Accessibility and connectivity:***

Accessibility and connectivity influenced the ICT choices of transnational students. Transnational students often used technologies that had a broad and far reach by users in both their countries of studies and their home countries. Also, even if the technology was easily accessible, they factored in the issues with connectivity as they preferred technologies that could function even with poor and low internet and telecommunication networks. This was because they did not trust the quality of their home country's network infrastructures and thus, preferred technologies that could easily sustain a fluctuating internet and telecommunication networks.

– ***Usability and productivity:***

Transnational students often preferred to engage ICTs that they could use productively in achieving their tasks, objectives, and goals, whether as students, instructors, in communicating with family or friends, in using their debit cards in paying for goods at a grocery shop or in taking an UBER to school. Their choice of ICT was based on how skillful they were in using those technologies and what those technologies provided in attaining their desired goals. They engaged these ICTs after evaluating the values and benefits these technologies added in their bifocal lives as transnational students.

– ***Design:***

Design also played an essential role in the types and kinds of technologies that transnational students used. They often preferred to use technologies that were user–centered design and that

did not have features and functions that distracted the users. Thus, they mostly engaged technologies with simplistic and minimalist design features as they could quickly learn and use them productively.

3. How can transnational students' digital literate practices impact the mainstream beliefs of ICT choices and uses in different contexts?

The research narratives revealed that the different types of technology integration and training workshops targeting transnational students, especially new transnational students seemed to construct transnational students as having limited or not having the necessary skills in navigating different ICTs in the academic and non–academic lives. These positions are somehow tied to the fact that most of the high end or new technologies are not available in their home countries, and thus, they had limited or no access to them and do not possess the technology literacy skills to use them productively. This creates a technology literacy deficit for transnational students. However, the findings from the study revealed a somewhat different position for this. Some of the participants in the research revealed that they had engaged new or "high end" ICTs and also had advanced technology literacy skills even before embarking on their graduate school journey in the USA.

In summary, their narratives revealed that transnationals students were mentally and psychologically ready to embrace and learn new technologies constructively and productively. Also, they never resisted the use of any new technology but instead sought help and explored alternative technologies whenever they had the option to do so. Even though learning some of the new ICTs were at times frustrating, transnational students developed a sense of resilience and a never–give–up attitude; the cultural beliefs of their home countries influence this trait. Lastly,

transnational students did not just engage new ICTs at face value; they questioned the use and valued the technologies offered before engaging them.

4. **How can transnational students' literate practices and experiences influence the ways technology industries design and develop ICTs in a globalized society?**

Technology industries exist because of its users, and without the users, these industries must cease to exist. Thus, technologies should be designed with and for the users. A major concern shared by some of the research participants was that most technologies were not designed with some users in mind. For example, Skype is considered the leading video conferencing technology in the world but it was not all designed with educators in mind. The recent COVID–19 outbreak exposed that deficiency of the technology, as many schools complained and were frustrated about the slow response rate in communication between teachers and students. The slow response in communication leads to communication breakdown and thus, students cannot effectively follow lectures–which defeats the purpose of learning and knowledge building. As a result, most universities instead adopted the use of an alternative video conferencing technology called Zoom. Another example is the user interface design of computer desktops.

The desktop is mostly primarily designed for office or professional settings. Thus, some users have to tweak or customize the technologies to meet their needs. This is not always productive because the users need to have the tweaking literacy skills and many users are not grounded in that. This becomes a great challenge for students who do not have the necessary technology skills to tweak the desktop and thus slows down the intended effectiveness and productivity of the technology. It would indeed be challenging to find ICTs that have one size fits all, but we can have technology industries design technologies that meet and match the needs of different user groups.

As such, the study invites technology industries to consider the following before and during their design process:

- Technologies should be designed with users. It should be user–centered design.
- Technologies should be built for specific users and not just to serve all users.
- The design with users should be based on their needs using research strategies of focused groups interviews of different user representations across the country
- Technology industries should strengthen the privacy and data security of its users.
- Technology industries, especially those that deal with programs and applications, should consider compatibility options for various platforms.
- Consider using Google's platform ideology of having one technology that houses other sub–technologies. For example, Google has functionalities like mail, classroom, hangout, drive, doc, and mail.
- Technology industries should consider the design that is simple and minimalistic.
- Technology companies should think about pricing by taking into consideration the different income levels of its users and potential users in the world.

6.4 ANT and Research Findings

As discussed in Chapter 1, Actor Network Theory (ANT) is often invoked to understand the relationship between human and non–human interactions and agency. In this study, I used ANT and specifically ANT diagramming method by Liza Potts(2008) to understand the temporal relationships that were created by the interactions between the students (human actants) and the ICTs and other factors in the surrounding environment (non–human actants). As ANT postulates

that agency is shared equally between human and non–human actants, findings from the study led to the proposal of a model for understanding the experiences of transnational students and as well as other students in their ICT practices. I coined it as a Transnational student User Experience Model (TUEM).

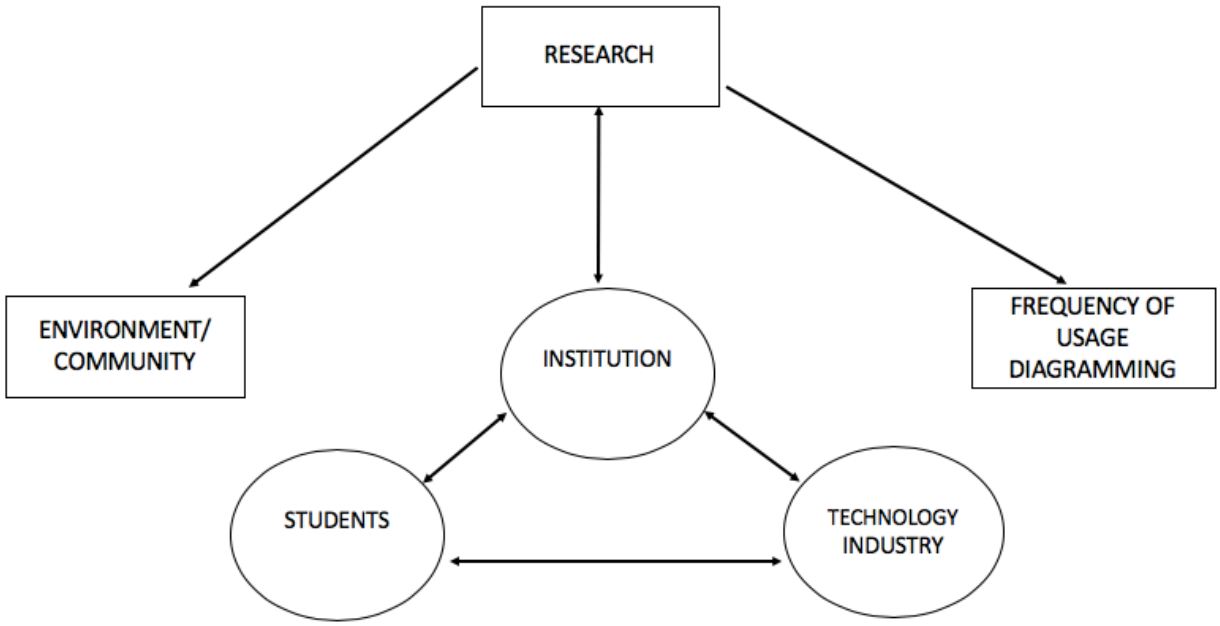

Figure 6.1*: Transnational student User Experience Model (TUEM)*

In the diagram above, the institution, students, and technology industries are the primary, secondary, and peripheral central actants, respectively. The two–directional arrows indicate a two–way communication and interaction between one actor and another. A one–way arrow indicates that an actor seeks to understand a phenomenon, using research in this case, in the pointed community or context of practice. Any of the central actors can negotiate the research to understand the practices in a community and their usage frequency to understand the practices and

make decisions and choices based on their goals and needs. Now, let me elaborate on the different components of the map:

6.4.1 Central Actants

Although actants have an equal agency under the ANT model, there must exist a central actant that affects and is affected by other actants. The study revealed that there was more than one central actant. The actants included the academic institution, the transnational students, and technology industries. However, the academic institution is the primary central actant, while the transnational students form the secondary central actant, and the technology industries constitute the peripheral central actant. The academic institution is the primary central actant as its existence prompts transnational students to even engage in their quest of higher education in the first place. The academic institution makes decisions and also influences the kinds of ICTs that transnational students engage in their academic and non–academic lives. The transnational students become the secondary central actants as they influence the decisions and choices that academic institutions make with the different types of technologies that the institutions require and recommend. Without them, the institutions may not have to make any decisions on ICTs. Also, the transnational students engage technologies in the non–academic lives in the pursuit of higher education to connect with family and friends, to work and navigate other social activities–as a result, they influence the different ICTs that technology industries design and produce.

I consider the technology industries to be the peripheral central actants as their design and production choices are often informed by the choices and decisions made by academic institutions and as well as the choices of transnational students. As a primary central actant, the academic institution somehow influences the types of technologies that technology industries produce that transnational students end up using in both their academic and non–academic lives. On their part,

transnational students as secondary central actants choose and use technologies approved by the institution in their academic lives. In terms of their non–academic lives, transnational students engage ICTs based on their economic power and the prices stipulated by the technology industries. The technology industries, as peripheral central actants, use a marketing model in designing and producing technologies that institutions adopt for transnational students to use and also that transnational students use for their non–academic lives. The research further revealed that more has to be done for these three central actors to cooperate and collaborate to understand each other in order to make decisions that will be productive for all parties. One of the best ways to do this is through empirical research.

6.4.2 Empirical Research

In order to explore and understand the ICT experiences of transnational students or similar groups of users, I am proposing the use of qualitative empirical research. This involves research that enables the gaining of knowledge through the direct and indirect observation of experiences or understanding the experiences of a person or group of persons. Thus, the researcher seeks to understand, by describing accurately, the relationship and interaction between the human actants (humans) and the non–human actants (technology, materials, and other environmental factors). Understanding the temporal relationships and interactions of human and non–human actants entails that we must research about and with the actants in order to find common ground.

This research and negotiations can, somehow, lead to effective and productive design, production and use of ICTs that represent and addresses the needs of all three central actants– transnational students in navigating graduate life, the institution in achieving its goal of furthering knowledge building, and industry in achieving its business goals. Yes, businesses can make profits

still while meeting the needs of its users. Thus, the research can be conducted by any of the three actors, or they could collaborate.

6.4.3 Environment/Community

The environment and community play essential roles in influencing the interaction and temporal relationships that are created in an ANT model. Transnational students' choice of ICTs is influenced by environmental and community factors such as the institution and its community policies on ICTs, the students and their digital literacy exposure–from their home countries and their current environment, and the technological infrastructure of the academic and non–academic spaces that these students navigate. These factors have agency and thus influence the ICT choices of transnational students.

Also, institutions and technology industries' technological options are influenced by the communities in which they serve. For example, a college in Silicon Valley, CA, is more likely to make use of sophisticated technology than a similar college in Waterville, ME. This may be because the Silicon Valley is considered the heart of technology innovations in the USA, and this will significantly have an influence on the community. Even though the same cannot be said of Waterville, we can never draw such a conclusion. In this case, research becomes vital in understanding the experiences and choices of the users in that community. This is because we cannot base our judgments on location or environment—we may be amazed by what we can find through empirical qualitative research.

6.4.4 Frequency of Usage Diagramming

The frequency of usage of certain technologies by transnational students should influence the institutions and technology industries to understand the experiences and translate these experiences into focusing on designing and producing technologies that meet and matches the

needs of transnational students in their quest for higher education. The institutions will also understand the technology to prioritize and those not to. In chapters 3, 4, and 5, I used diagramming to indicate the different human and non–human actants in the bifocal lives of transnational students. The diagramming depicted the frequency of usage, interaction, and the relationship created. This diagramming can help institutions and technology industries understand these students' experiences and make better and informed decisions with ICTs.

I want to re–emphasize that an essential principle of ANT is to describe (Latour 2005) and not explain a social phenomenon. Thus, the reason why I described the experiences of transnational students in engaging ICTs and not explain their experiences. There are important factors that were found in the research, such as cost and pricing, but I did not include in the TUEM map because findings may be different for different contexts and in different studies. The goal is not to recommend certain technologies/platforms. It is the responsibility of interested parties– whether researchers, institutions, or technology industries to evaluate the technologies based on their needs and objectives.

6.5 Implications of Research Findings

6.5.1 ICT Literacy Exposure

Transnational students were not aware of the technologies they were going to use in their academic lives, and it was somehow difficult to navigate the different ICTs. Thus, it had several implications on their level of preparedness.

ICT and Academic Use

There were very few options available to choose from in regards to the learning technologies. As instructors, some of the participants did not possess the necessary ICT literacy

skills to teach students using technology. Some of the participants come from a country where the academic setting makes little or no use of technology in teaching. For example, Bee comes from Nepal and was a teacher for over 20 years before moving to the USA for graduate studies. He only made use of computers in attending conferences and never taught using a computer back home. Upon arrival in the USA, he was required to teach using a computer, projector, speakers and as well as using Blackboard as the official learning management system of the institution. He had no option as it was a requirement of the institution and the program.

Furthermore, as students, some of the research participants had to spend extra time doing self–learning or seeking help from the support department on how to use certain technologies in achieving their academic goals. For example, Bee would use Youtube videos and always visited the technology support help desktop to get support in order to make use of technologies in his studies–technologies he had to use in order to be successful in his studies.

ICT and Family

The literacy level of family members significantly influences transnational students' choice of ICTs. Also, this will depend on the availability and accessibility of those technologies to the family members. Among these, accessibility is primary. Due to issues of network and connectivity, the transnational students make decisions on which ICTs to engage. Tee communicates with his mum using Whatsapp technology because it is available in his home country, its simplistic interface makes it easy for his mum to use, and although the internet network and connectivity is not always the best, the technology easily supports a poor technology network infrastructure.

ICT and Friends

Transnational students mostly use different social media platforms and communication programs/applications to communicate with friends. Their ICT choices were based on the

knowledge and use of their friends. So, friends' exposure to and knowledge and use of certain social communication technologies directly influence their choices.

ICT and Job

Some of the transnational students have advanced skills with using ICTs in executing their job, but a significant concern raised was the essence of using these technologies in teaching and the technology literacy level of the students. From the study, some of the participants questioned the rationale for using certain technologies. They stated that students could still complete some projects without necessarily using the required technology. Even if they do use it, it somehow felt like the focus was more on the product and not the process; it distorts the true meaning of learning with technologies. Also, some of the students do not possess the necessary technology literacy skills in addressing the required projects that enforce the use of certain specific technologies.

ICT and Other Social Interactions

Transnational students engage ICTs in other social interactions based on their needs and the availability of the technologies. From entertainment to financial transactions, to directions and transportation, they navigate and choose technologies that they are comfortable with and can quickly learn how to use. Tee uses the UBER ride–sharing application over LYFT because he believes it is easier to use and has a better rider location function. Meanwhile, Bee uses Apple pay to pay for his store purchases as it makes life easy, and he can even earn discounts by using the app. Also, he does not have to worry about carrying debit/credit cards around as the app on his phone will do the same function.

6.6 Recommendations To Industry And Academy

The participants in the research provided some recommendations that, I believe, will help technology industries as well as universities to understand and implement policies and practices that take into consideration the transnational student population– from design to development, to production and as well as to the types of technologies provided and recommended by academy institution to serve the needs and wants of transnational students. The recommendations are as follows:

6.6.1 Industry

Design:

With the rapid evolution of technology, what many technology users are paying close attention to these days is the design. There seem to exist an intersection between design and experience, and it is fast becoming even difficult to separate them. Design affects experiences and vice versa. Therefore, technology industries need to consider the following;

- The design of technologies should place students, teachers, and academic professionals as primary users with interface, browsers, and other design features.
- Profiles could be created and pre–loaded to match the different users and their needs.
- A student–centered user interface/design.
- Computers are built for specific users and not just to serve all users.
- The design of hardware/software with students based on their needs using research strategies of focused groups interviews of different student representations across the country

- Although there is no universal design but emulating a design that many people are used to will make certain technologies better. For example, Blackboard.

Privacy:

With the proliferation of digital technology and the availability of microphones, cameras, and other data–driven applications and functionalities on ICTs, users are becoming very concerned about their privacy and safety. They want to be sure that they are not spending much money to gain access to technology and, at the same time, putting themselves at risk by exposing their private and confidential information to the public or potential hackers. It is there the duty and responsibility of technology industries to strengthen privacy and data security and make the privacy and security, especially encryption, setting options on technology devices evident to users. The encryption will provide more data security and privacy to users as their lives depend on these technologies.

Facebook:

Facebook is considered the benchmark for social media communication in the world, and that is why they have billions of users and even millions joining the platform almost every week. Even though Facebook has established itself as a dominant social media platform, there are still some aspects that the platform can consider in order to become better to meet and satisfy the diverse needs of its users. Below are some recommendations;

- Facebook should consider dropping the ads appearance system and look for alternatives schemes to generate profit.
- Facebook should consider the age brackets of the users and avoid suggesting declaration of status (upload of videos/stuff) because it may not be useful for all age groups.

- Facebook should consider glocalization its platform to promote local life/culture such as Facebook Mexico.
- Facebook news/information should be location specific and encourage location consumption of information such as local news.
- Facebook should improve its translation tool as it is not effective– it changes the meaning of words/sentences.
- Facebook design could be made simple and minimalistic.

Others:

Based on the study, other recommendations were made and they include:

- Technology manufacturers should think about pricing by taking into consideration the different income levels of its users and potential users in the world.
- Tech industries should provide better service with repairs and maintenance of technologies such as virtual and immediate assistance.
- Phone networks should incorporate better international call bundles to communicate with family rather than buying phone credit from online services like Rebtel. Adding that having national and international calls function the same as national calling services can help in emergency situations when either party does not have data services on their phone.
- Manufacturers of technologies that deal with files should consider and invest more on compatibility with different platforms.
- Open–source software manufacturers and developers need to be more user friendly and have more friendly user manuals and tutorials similar to the commercial ones.

- People who have access to technology should help bridge the gap with people who do not have access.
- Being a tech giant, Google should make more information/services available offline and not just the map.
- Technology industries should think about modeling their technologies to house everything like the idea of Google with different functionalities like hangout, drive, doc, mail, etc.

6.6.2 Academy

Academic institutions play a significant role in helping and assisting transnational students in integration into their new communities–both in academic and non–academic settings. In the academy, before requiring and recommending technologies that transnational students should engage, universities should consider what Leu et al. (2005) posited as being essential to ponder before bringing new literacies into classrooms. They posited that" merely using software programs on computers does not prepare students for new literacies' expectations; new literacies are deictic in that they continuously change and require teachers to embrace these changes; and new literacies are essential in classrooms so that equal opportunities are offered to all students" (Leu et al., 2005). Besides this, universities also need to consider the following:

Training and support:

- Training should be implemented as a way to improve the use of technologies. The training should be user specific and should be based on the identified gap to improve the use and productivity of technologies.
- Create programs to measure the level of preparedness of transnational students in using technologies.

- Create supportive programs for transnational students in their transitions into the new world filled with technology

Student and design profile:

- Pre–loading of profiles for students to enable students that are not tech–savvy to navigate the computer easily
- Universities should ensure that the manufacturer customizes the technology to meet the needs of students before buying. Adding that customization makes things easier for students/teachers.
- Universities have to learn how to tweak/change the interface to meet the needs of students/teachers
- Universities can help influence the way the technology used by the school is designed and should be willing to change to new technologies when the current ones no longer meet the needs of the institution.

Cost and needs:

- Acknowledging that finance plays a significant role in such decisions but the university should put the needs of the school community first.

Google:

- Advising that we need to learn how to access Google books because almost all of the books are available for free access.
- Schools should copy Google books platforms and produce open–source videos for university materials.

Social media:

- Recommending the incorporation and use of social media platforms (Twitter, Facebook, and Instagram) in the academic curriculum.

Open source:

- Advocating for open–source information that relates to research at the university.

The significance of transnational students in the USA cannot be overemphasized as they constitute a significant population of the US higher education sector. It is not solely the responsibility of either the industry or academy to ensure that transnational students integrate and navigate their new communities using ICTs. It should be a joint and collaborative initiative to meet and match the needs of these groups of students with the use of technologies. This is achieved through research in understanding transnational students' experiences, such as this study, and using the findings to help guide academic institutions and industries in their policies and options of designing technologies that best serve the needs of transnational students.

6.7 Research Contributions

Findings from this study provide important and valid contributions to conversations about transnational students and the use of ICTs. Specifically, transnational students possess advanced knowledge of technology as opposed to literature. Also, the cost and design of technologies play an essential role in the choice of technologies used by transnational students. Furthermore, transnational students are very adventurous and always willing to try new ICTs based on their needs and wants; it is often better when they have the choice than when they are limited or mandated to use only specific technologies. In addition, using technologies can be facilitated by

training. Thus, training should be user and need specific rather than generic- generic training does not add value to the literacy level of transnational students. Lastly, family communication forms a core part of communication in the lives of transnational students. Family communication plays a vital role in helping transnational student students settle in their new environment and to stay on track– the family provides a strong support system.

6.8 Research Limitations

Researching about a group that shares similar traits and characters as the researcher can be somehow challenging in terms of not switching roles during the interview or allowing your experiences to skew your interpretations and analysis of the data. This was a challenge for me, but I constructively and productively overcame this by sticking to the professional and ethical codes of conducting research. One way I did this was to allow the participants to write with me to ensure the credibility and validity of the study. That way, the information I included in the study was an accurate representation of their experiences with using ICTs.

Another challenge I faced with the study was the delay in the IRB approval process. The timeline was relatively short, and if with more time, I could have expanded the research in these different ways, and that would have helped me learn other things. I had plans to observe the participants engage ICTs in real time but due to time limits, it was not possible. Observing them engaging these ICTs would have provided a first person view and an insightful position on their use of these technologies.

A third challenge I experienced with this study was to secure funding for the study, as I had to argue for my case more than two times to the committee before it got accepted. The study required the collection and interpretation of more than 13 hours of recorded data. It was

challenging to apply and receive funding to support me with the required technologies needed to conduct and complete the project on time. Also, as a transnational student, I usually do not work in the summer, and the funding was going to help me focus on completing my research. Although the negotiating was tough, I finally received the funding.

Despite all of these challenges and other minor challenges that come with conducting a Ph.D. research, such as time management, and research stress, the research findings will be valuable to the academy and as well as technology industries that directly affect the lives of transnational students and even national students with their use of technologies. Thus, the research contributions, in the section below, will ensure that universities and technology industries understand the ICT experiences of transnational students to incorporate these groups of students in the design, production, and choice of technologies that add value to their experiences as users and not just consumers.

6.9 Recommendations For Future Research

Future research on this topic could focus on understanding the digital lives and experiences of transnational undergraduate students with engaging ICTs. This research focused on graduate students, and conducting similar research with undergraduate students may provide and reveal insights different from those in this study. Specifically, future research could adopt an ethnography framework where the students, in real time, self record and document their academic and non–academic digital literacy practices over a reasonable period of time. The research investigator would observe and use a series of time–bound follow up interviews and conversations to learn and understand their experiences. Such a project may likely become a multimodal project or even later on converted into a documentary. Transnational students form a core part of undergraduate

students in the USA, understanding their experiences using such a research framework will provide an invaluable understanding to both the academy and technology industries as well.

In conclusion, technology, especially new ICTs, experience rapid change over time, and Even though it may be challenging to follow up with the fast changes and innovations, universities need to recommend technologies based on the needs of specific users and may want to avoid mandatory requirements. If they must make such mandatory requirements, then they need to train the users based on their specific needs. Also, technology industries need to design, develop, and produce technologies with specific users in mind and not just a general design, development, and production for universal users.

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Vita

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