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Implications for CALL: Teachers' Perceptions and Use of CALL in the Classroom

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Implications for CALL:

Teachers' Perceptions and Use of CALL in the Classroom

by

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Abstract

The goal of this study was to ascertain graduate students' perceptions of technology use in language learning classroom. More specifically it sought to find out how the graduate students perceived technology, how technologically savvy they felt they were, and how they actually use technology and Computer Assisted Language Learning in their classrooms. A survey was conducted with 14. From those 14 participants, 4 individuals volunteered to take part in an interview to answer questions pertaining to their philosophy about technology, when it is beneficial to language learning, when it is detrimental to language learning, and how technologically adept they feel they are concerning technology and how that drives their use of it in their classroom.

The survey is broken down into three sections. Section I focused on the collection of demographic information through 11 open questions and 5 closed Yes/No questions. Section II was comprised of two closed yes/no questions as well as 4 open questions pertaining to whether the participants have used a computer to learn a language. Section III consists of 94 Likert questions that participants can mark their answer as 1-6 with 1=Strongly Agree, 2=Agree, 3=Slightly Agree, 4= Slightly Disagree, 5= Disagree, 6=Strongly Disagree. Within Section III the questions can be attributed to three different categories: Perception of computers and technology, instructor affinity for computers and technology, and instructor's use of computers and technology in the classroom. Results show that instructors have a favorable view of technology, a slightly lower view of their personal affinity for technology, and a favorable view of technology use within their classrooms.

Keywords: CALL, CAI, Computer-assisted language learning, teacher perceptions, technology use in the classroom.

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Chapter I: Introduction

In the technology community, an observation commonly known as Moore's Law exists. First introduced in a paper he wrote in 1965, Gordon Moore (co-founder of Intel) made a hypothesis stating that, due to the observed increases in technology, falling costs of production, and general need, every two years the number of transistors in an integrated circuit would double (Moore, 1965). Gordon Moore's prediction and observation has held relatively true for the last 40 years (Takahashi, 2005). It explains why today's cell phone, which can fit into your pocket, holds more processing power than the original Apollo Lander (Takahashi, 2005). Nearly 20 years ago in October, 1997 only 26.6 percent of households had computers and further back in 1984, only 8.2 percent had a home computer (U.S. Census Bureau, 1997). As of 2013, that number has risen to 83.8 percent of U.S households reporting computer ownership (File & Ryan, 2014). This huge jump in computer use and access to information has had a large impact in all areas of our lives. These technological jumps and increased access to information do present a problem to the Second Language Acquisition community. How do we effectively utilize the changes in technology, and even culture, due to this technology in the language learning classroom?

In her 2016 article, Dorothy Chun suggests that "technology in SLA research will assume an increasingly greater role" (p.98). Bax's concept of normalization and technology's advancement further supports this notion (Bax, 2011; Bax, 2003). Normalization as defined by Bax (2003), is a concept that can be related to technological innovation of any kind "and refers to the stage when technology becomes invisible, embedded in everyday practice and hence 'normalized'." (p. 23). Examples of normalized technology are boundless and a few examples

would include a pen (or pencil), paper, and books. These technologies are relatively invisible and often taken for granted in not only the classroom but also everyday life and can be deemed as "normalized". Bax (2003) argued that the goal of CALL should be in fact to move toward a point where the computer, "Probably very different in shape and size from their current manifestations", will reach an eventual state of normalization (p. 23). The computer would eventually be used "without fear or inhibition, and equally without an exaggerated respect for what they can do." (p. 24). Instead, the computer will be fully integrated into aspects of the classroom life, appearing mostly unnoticed, alongside other normalized technologies (Bax 2003; Bax 2011).

Problem Statement

However, with education research focusing on technology and its advancements; it seems to rarely focus on teacher perceptions of the use and efficacy of that technology. If any mentions of teachers' perceptions exist within research, it seems to be a minor addition. While figuring out which types of Computer Assisted Language Learning (CALL) are effective, it should be equally important to find out instructor perceptions, and opinions, concerning types of CALL as well. In their 1997 article, Chun and Plass pointed out that "the primary research question is not whether multimedia instruction is effective, but rather under what conditions and for whom." (p. 69). Instructors act as not only as porters of knowledge but also as mediators, evaluators, and guides in the quest to help students identify relationships among ideas as well as identify any errors of language to aid the English Language Learner.

Aim of the Study

      With a role this large, instructors' input into not only what works, but how they perceive CALL and technology in the classroom is essential, and could be an aid into where further research should be focused. The goal of research is to shed some light into the perceptions that (relatively) newer teachers have concerning technology and its use in the language learning classroom. Hopefully this will aid further research by inspiring other researchers and institutions to work with teachers when generating goals pertaining to the use of technology and their educational goals. This could help reduce needless expenditures by institutions for technology that is not fully developed, implemented, or utilized. More importantly, this cooperation could help our future students in achieving their language learning goals through a more effective use of technology in the language learning classroom.

Chapter II: Literature Review

This literature review will discuss how technology developed in today's classroom. It will begin with radio and how it was implemented for distance learning and language learning and how it paved the way for early Computer Aided Instruction utilizing the PLATO system with centralized computers and terminals. Technology present and in use in today's classroom including online courses, social media, and gamification in the classroom will also be discussed. Issues present within Computer Aided Instruction and Computer Assisted Language learning as well as the three philosophies and relative time periods that each one was most relevant despite major overlaps among the three will be covered.

The Start of Technology Assisted Learning: Radio

When examining Computer Assisted Language Learning, it is important to look at how it developed. One of the earlier uses of technology in the aid of language learning was used by Bolinger. Bolinger held bi-weekly Spanish classes on the radio in the early 1930s. In Bolinger's 1934 paper for *The Modern Language Journal* titled "Spanish on the air in Wisconsin," he cited some opinions of listeners that oddly enough sound the same as some learners today. One learner wrote about radio that, "[it] is the most efficient way possible for the study of language for all those not in attendance at the university … time saved from tedious trips back and forth to classes only to listen … to the inaccurate and halting recitations by students no better prepared than oneself" (Bolinger, 1934, p. 217). Bolinger's (1934) study of the delivery of instruction (although through a different medium) via distance learning showed benefits for students in not only rural locations but also for those students who have been "spurred to do additional work on their own initiative" (Bolinger, 1934, p. 218).

Radio was sought as a medium due to its relative ease of accessibility and presence within most homes. On the other hand, some learners and rural educators, felt that the broadcasts were set at a time slot (afternoon) that does not guarantee all interested individuals would have access (Bolinger, 1934). While they had accessibility to a radio itself, due to the demands of their schedules, the programs may not be convenient. The early research into radio and technology itself as a medium often overlooked teacher input. Many studies often used teachers as a means to gather information as to the efficacy of their program rather than soliciting instructor's constructive input. Rothney and Hansen (1947) conducted an evaluation of radio programs' viability as a means of instruction for inter-cultural communication. More specifically, their program sought to teach students about stereotypes and conflict resolution through various broadcast programs (Rothney & Hansen, 1947). Like much of the research of the time period, the main input solicited from the teachers in Rothney and Hansen's (1947) study was evaluating how well the program worked. However, they also sought the teachers' input and judgement concerning the value of the program as well as suggestions for its improvement in their classroom (Rothney & Hansen, 1947). By meeting with the teachers and students who listened to their radio broadcasts, Rothney and Hansen were able to elicit information about their program that a simple survey, or a study of the program's effectiveness, would have otherwise missed. Teachers and students both pointed out that some of the characters in the shows were far too fabricated and they were not relatable (Rothney & Hansen, 1947). On the other hand, very relatable characters existed in other programs (Rothney & Hansen, 1947). The opinions about the programs' characters varied among the schools that took part in the study.

Rothney and Hansen's (1947) evaluation showed a resounding agreement that the program fostered better thinking and action in the students concerning racism and classism. However, negative opinions from instructors were expressed such as "radio programs are a burden" and "excessive use of the program would involve an excessive amount of work" (programs (Rothney & Hansen, 1947, p. 112). Of particular interest are teachers' suggestions on what would make the programs better. Various teachers voiced that the programs need to address the real-life situations that the students at their schools faced, characters should be more authentic and genuine, and despite being a positive the program could use some form of interaction (Rothney & Hansen, 1947). While the researchers at the time may have regarded the feedback as constructive, it almost seems prophetic looking at it now from 2016. In this age, efficacies of programs are based on exactly what some of those teachers suggested nearly 70 years ago: programs should be relatable, authentic, and should have some form of interaction focused on the learner.

Along the same lines of research, Henderson (1968) sought to teach mathematics via radio instruction. The broadcast instructed teachers on what to do at the chalkboard thereby utilizing them as pseudo-assistants (Henderson, 1968). After the broadcast, teachers were asked to fill out a questionnaire consisting of five questions, four of which were simply demographic information concerning the classrooms, difficulty in following the instructions outlined, and number of students reached by the broadcast. For the fifth question, Henderson (1968) went on to simply ask a yes or no question to the teachers :"Do you feel that future radio broadcasts can be of value to you during your teaching high school students the subject matter of mathematics" (p. 56). Every teacher (59/59) answered yes to the question. Interestingly, miscellaneous

(unsolicited) comments came in with the questionnaire as well. Some of the teachers from Henderson's (1968) survey seemed positive about the experience, "students liked broadcast very much," and "different, interesting, explained well" were a couple of the responses (p. 58). Others offered suggestions such as requesting copies of script ahead of time, knowledge of the topic prior to the broadcast, and taped and stored programs to be played at the correct time within their schedule. One teacher respondent from Henderson's (1968) survey answered positively to the questionnaire yet pointed out "there is so much material to cover in regular work, I just don't have time for anything else" (p.58). These unsolicited suggestions and comments were key to the radio broadcast programs, as they outlined both positive aspects of the program and deficiencies that the teachers saw and encountered. Yet, the suggestions and comments were referred to in the study as merely a matter of interest or simply a footnote.

In an effort to direct other researchers toward the uses of radio, Garfinkel (1972) wrote a review of resources pointing to a few of the studies used in radio. He opined that little was still relatively known about this "potentially valuable learning aid" (p. 158), and despite a few studies done, some of which had flawed experimental designs, greater research was needed to allow a better exploitation of a medium that can provide a classroom with a "wealth of stimuli from all over the world" (p. 162). Of the same mindset, Wipf (1984) provided a list of thirteen major benefits to radio broadcasts. He argued that the uses of a shortwave radio to listen to broadcasts from around the world of the target language would be beneficial. Some of the benefits included were relevant "cultural information ... and current models of language use," grammar can be acquired though the context of real language, increases in listening comprehension due to "hearing target language at normal speed," students can be exposed to different regional

language variations, accessibility to less available or less commonly taught languages, and an increase of motivation can be had by learning with authentic and original broadcasts (p. 7).

However, Wipf pointed out though that the use of a shortwave radio can have pitfalls. Among these pitfalls are issues with signal strength, differences in time zone, being only able to hear the broadcast once, and being constrained by the topics that are broadcast in the target language country (Wipf, 1984). Echoed within Wipf's (1984) study as well are teachers possible increased workload needed to create lessons that effectively utilize the broadcasts used in their classroom.

Early Computer Aided Instruction

There is no specific date and time that educators switched over from researching radio broadcasts and education to computer aided instruction. In fact, large overlaps of the technologies exist, even today. Computer Aided Instruction came about much earlier than one would think. In the days when computers required a full room, Universities and some businesses would set up time-sharing of the terminals. One of the earlier research studies was performed in 1968 by Adams, Morrison, and Reddy. In an effort to set up a new type of language laboratory, they wrote a program that students would use on terminals. The students were faced with questions, pictures, and audio clips and prompted to give the correct answer. If the student was unable to get the correct answer, another question or prompt of the same type was given until the student achieved a passing score and was then allowed onto the next module. Some parts of the exercise with the terminal required the student to self-assess as well.

Although computers were relatively rare in 1968, Adams, Morrison, & Reddy (1968) saw promise in its use "as an education tool CAI has potential in its capability both to supervise

student performance and to monitor, record, analyze, and summarize data about that performance" (p. 3). However, in outlining the program the only mention of teachers were two brief explanations of the teacher's responsibility, that of mainly a goal setter and coder. In their research the only other mention of the teachers referenced that "both teachers and students liked the laboratory on the whole" (p. 15). As was the case in aforementioned studies, no focus was directed at the teacher and their perceptions of the program, merely description of and an analysis if the program as a whole worked.

It was not until the advent of the Programmed Logic for Automatic Teaching Operations (PLATO) system was developed that most of the early computer aided instruction programs were available. Much of the designs were like Adams, Morrison, and Reddy of 1968, instruction on the PLATO system which provided students with questions. In the event the student provided a wrong answer the system would provide feedback or allow the student to select <Help> in this system promoting the student to find the correct answer. Curtin, Clayton, Finch, Moor, and Woodruff's (1972) study used the PLATO system to instruct students in Russian. Through their use of PLATO to quiz the students on questions, providing timed drills, and gradual increases in difficulty Curtin et al (1972) felt that the "PLATO system permits each student a great degree of individual instruction" (p. 354). Students were able to face the material at their own pace and were able to repeat sections they felt necessary to not only meet instructor requirements but their own personal satisfaction (Curtin, Clayton, Finch, Moor, & Woodruff, 1972).

Technology of Today's Classroom

No one can argue that today's technology has grown by leaps and bounds. Among the technologies that are utilized today are Online Only classes, Social networks, Mobile Assisted

Language Learning (MALL), and Online Gaming. One study done by Pew Research Center

shows that 68% of Americans have a smartphone and 67% have broadband internet at home,

with a joint 56% reporting having both a smartphone and home internet (Horrigan, 2016). It is

no wonder that educators have sought to utilize the tools that both they and learners possess.

One of the earlier concepts that came with the advent of the internet was distance learning

(online courses). In the same Pew Research Center study, 14% of Americans reported being

very familiar with distance learning and 24% reported being somewhat familiar (Horrigan,

2016).

In terms of online learning and face-to-face learning, educators in Wray, Lowenthal,

Bates, & Stevens' (2008) study reported that certain aspects of learning worked better in face to

face settings versus online education and vice versa. Among the different strategies for

instruction, the educators felt that presentations and group discussions were, and should be, used

more often in a traditional face to face classroom (Wray, Lowenthal, Bates, & Stevens, 2008).

One instructor put it plainly that "you just don't get that good old-fashioned interface" when

commenting on having presentations created (such as PowerPoint) by students and having them

posted online without any ability to have the presentation's creators engaged in discussion by

other students (p. 246). Other instructors opined that they feel "debates and brainstorming was

not effective outside of a face-to-face environment because they believed these strategies require

students to respond immediately" (p. 246). It is interesting to note that among the instructors,

some reported in Wray et al's (2008) study that teaching online helped instructors to think about

the ways they taught and "broadened their awareness of student needs and methods to engage

them" and has also led the instructors to "integrate technology in face-to-face classrooms more than ever" (p. 246).

An interesting bit of research by McKeon (2014) compared learner and instructor attitudes towards online learning. The results published showed 80% of learners reported more enjoyment with online learning versus 64% instructors reporting the same (p. 66). At the same time, both instructors (85%) and learners (96%) reported liking the accessibility of online learning (p. 66). The instructors tended to prefer face to face classroom learning more than the learners. McKeon's (2014) study showed that instructors felt that they were available when students needed guidance only 64% of the time, but at the same time 80% of learners felt that when guidance was needed, their instructor was available (p. 68). This divergence in numbers is interesting to note as it could be indicative of underlying issues that may explain why instructors feel they personally weren't readily available for guidance, yet learners felt that the instructors were.

Another addition to instructors' tools for teaching is Web Based Learning Tools (WBLT). WBLTs are integrated online components that can be used in a traditional classroom to add an online element or even in online only courses. Among the types of WBLTs are course/topic specific tools (that are far too numerous to list) as well as institutional type WBLTs such as Blackboard, Desire2Learn, and WebCT which are able to be adapted to fit the course and material as the instructor sees fit. Kay, Knaack, and Petrarca's (2009) study sought to find teachers' perceptions of these WBLTs, and found that 78% of teachers felt that students learned effectively with WBLTs. Among the findings, WBLTs were used 53% of the time for review of a previous concept (p. 34). Conversely, 6% of teachers rarely used WBLTs for use in teaching a

new concept (p.34). According to Kay, Knaack, and Petrarca (2009) these numbers could be

attributed to instructors being cautious and indicative of teachers' uncertainty of WBLT's value

or an unwillingness/inability to develop strategies to integrate WBLTs into their classroom (Kay,

Knaack, & Petrarca, 2009). The reasoning behind this possible attribution is due to a correlation

found between teachers' perceptions of the engagement level WBLTs possess and student's

actual learning performance, "in other words, if a teacher thought a WBLT was engaging,

students achieved significantly higher gains from pre- to post-tests" (p. 40).

Mobile Learning, or Mobile Assisted Language Learning, has been around since

electronic devices became capable of being carried freely. At first, cassette players were

utilized, which led to CD players and eventually MP3 players as well to be used for recorded

lessons that a listener could play back at their discretion. Presently, our personal cell phones

have become "smart phones" and are able to not only hold language dictionaries, flashcard

programs, and various e-books, but also a whole gamut of applications exist from which both

learners and instructors can use for language learning. Godwin-Jones (2011) points out that the

significant enhancements of the mobile phone's web browser, larger high-resolution screens,

more powerful processors, more internal RAM, and faster internet connectivity have allowed the

phones to act much the same as a computer, but it rests in your hand and offers nearly the same

abilities as tablet PC's. This has allowed previously used phrase e-books to have extended

ability to hold more content, include audio and video functions, and allow integration with online

sites (Godwin-Jones, 2011). The days of traditional flashcard programs are also over, as today's

flashcard programs can offer a wider range of support such as card editing, adaptation to the user

or content, and synchronization with desktop or online elements as well to save user progress (Godwin-Jones, 2011).

With the development of technology came Social Networks. At first, presented as text based sites, they have since evolved to allow pictures, videos, and even live broadcasts. As Lomicka and Lord (2016) point out, sites such as these "can offer learners the opportunity to observe native spoken language" (p. 262). Perhaps defined as a subset of Mobile Assisted Language Learning, Social Networking for use in the language learning classroom is just now gaining traction in the education field. Lomicka and Lord (2016) point out despite the potential that Social Networking (SN) presents in the field of education and its relative widespread popularity, it has simply not been embraced in education. In fact, according to Lomicka and Lord (2016), "Although there are an increasing number of academic studies related to various social media tools, many of them are not empirically based, nor offer strong theoretical advances" (p. 256). Adding to that, articles exploring teachers' perceptions of social networking appear extremely rare.

One such social network site that has expanded its utility is Facebook. Besides connecting with friends, Facebook has widespread uses from finding roommates, books, and items for sale to even groups in which individuals with similar interests can connect. Another module, named Courses, allow individuals to create a specific course page that others within the academic course can join in order to exchange knowledge, collaborate, set up study groups, and further discuss key concepts covered within the class. Facebook's expanded ability to share videos and pictures allows both instructors and students the ability to use multimedia within the aforementioned activities (Blattner & Fiori 2009). It is not difficult to see the benefits that a

language learning classroom can reap from the use of a social networking site such as Facebook. Lin, Warschauer, & Blake (2016) point out that because these social networks have an inherent peer-review built directly into them, they "may promote mutual engagement, as users collectively engage in discussion to achieve their goals (p.124).

Another avenue that educators have begun to explore involves Gamification. Deterding, Dixon, Khaled, and Nacke (2011) outlined a working definition of Gamification despite widespread contestation with the term. Their proposal defines Gamification as "*the use of game design elements in non-game contexts"* (p. 9). The main idea behind Gamification is that the primary purpose of video games is entertainment, and so under this direction the video games actually offer motivation for users, or players, to interact with them. Researchers and developers have since looked at ways to take the entertainment value of a game and direct it towards a goal with a more complex purpose than simple entertainment (Deterding, Dixon, Khaled, & Nacke, 2011).

Some have taken this idea, and using preexisting games, opted to incorporate them into their classroom mechanics. Others have created an entirely new game to meet their classroom needs. In July of 2016, a new game was released on Steam (a popular Online PC gaming store) in which an RPG (Role Playing Game), called "Learn Japanese To Survive! Hiragana Battle", was showcased. The game takes an RPG (a popular game genre) and replaces enemies with Japanese Hiragana; the player has to select the correct responses in order to progress in the battle. As the player progresses with the storyline they learn vocabulary, punctuation, and the proper responses within the Japanese language. Little research has been done as to teachers' perceptions of games and Gamification for language learning. Of the few studies, Baek (2008)

looked at teachers' inhibitions and hindrances towards their use of games in the classroom.

Teachers' responses to the survey led Baek (2008) to opine several factors which limited the

teachers, such as "inflexibility of current curricula" (p. 666), "teachers believe that games have

negative effects and may harm students learning", "teachers think students behave differently

while gaming", "lack of supporting materials", and "teaching with games requires expanded

costs" (p. 668).

Issues Present in CAI and CALL

Not everyone was enamored with the use of computers for language instruction.

Proponents of CAI and CALL had some push-back when it came to implementation into their

own language programs. Olsen (1980) published research concerning instructors' and language

departments' views of CAI and CALL. That research survey identified issues about CAI and

CALL and why language departments felt discouraged to integrate computers into their current

curriculums. Some of the issues pertained to a high cost of technology both for the hardware and

software, limited access to terminals, lack of funding, and a lack of knowledge pertaining to

computers and software (Olsen, 1980). While some of the statements and reasoning were merely

based on impressions, prejudice, and uninformed opinion, they also held fact within them as

well. Some instructors and language programs held a fear that a human instructor would be

replaced or the technology could even erode their current position. Olsen's (1980) study pointed

out a real lack of technical knowledge; even programs that are complete "require modification to

suit local needs" (p. 343). At this point in time, modifications required knowledge of computer

programming as well, which would entail further teacher training. Some of the commenters who

were proponents of CAI pointed out though that microprocessors are gaining some traction and the days of centralized computing systems with terminals may be numbered (Olsen, 1980).

Despite today's advances in technology, some of the past issues still exist today. Utilizing the Delphi method to properly identify what an optimal classroom needs for technology integration, Dillon-Marable & Valentine and their expert panel found four classroom characteristics needed (2006). The Delphi method entails selecting a panel of experts and having them answer a series of questions. From that point, the researcher acts as a moderator, compiles the information from each of the experts, and provides an anonymous summary of the findings back to the expert panel (Dillon-Marable & Valentine, 2006). After the panel reviews the findings, each expert is presented with another series of questions, while bearing in mind the answers from other members of the panel reported anonymously (Dillon-Marable & Valentine, 2006). This method is utilized because the expert panel's answers will gradually form a relative consensus toward a correct answer (Dillon-Marable & Valentine, 2006). The characteristics outlined included that a classroom with computer use needed to be "seamless" when moving between mediums such as books, computers, and discussions (p. 106). In essence, a classroom needs to take advantage of how every-day life has now integrated technology. Other characteristics found by Dillon-Marable and Valentine's (2006) Delphi study included a classroom in which computer use is appropriate, computer use is facilitated, and computer use is empowering (p. 108). This called for greater integration of technology into the classrooms.

Prensky (2001) defined students in this technological age as "Digital natives". Prensky argued that individuals that have grown up with technology such as computers, the internet, and video games may, in fact, be more technologically knowledgeable than their instructors. Many

feel that instructors have to take the difference between the language and culture of themselves and their students into mind when developing a classroom with integrated technology. However, dissent is common in reference to Prensky's description and definition of Digital Natives and Digital Immigrants. Apostolos Koutropoulos' (2011) article pointed out that Prensky and others who use the digital immigrant and digital native mindset are overgeneralizing traits of digital natives. Some of these overgeneralizations fail to take into account that individuals' minds and thought processes do not imprint at a certain time and date, but instead continually evolve and adapt to fit their surroundings (Koutropoulos, 2011). Not only do some feel that labeling students and instructors as overgeneralizing but also failing to take into account certain factors that may affect students' use of technology. Factors include the socioeconomic status of the students, whether they come from an underdeveloped country or culture, the degree of use of technology, how the tools and technology are used, and how the skills and behaviors learned would transfer over into an educational setting (Koutropoulos, 2011).

Some of the major disadvantages of early CALL actually still exist today. The financial obligation to both the school and the student is one such disadvantage. Language programs are moving to where computers have become a basic requirement. This can act as a barrier for schools with an inadequate budget or even students who have a relatively low-income (Lai & Kritsonis, 2006). Students and instructors both can lack the computer or technological literacy needed to effectively take advantage of programs and software available (Lai & Kritsonis, 2006; Tan & McWilliam, 2009). In their research, Tan and McWilliam (2009) found that despite user-friendliness and introduction to common web based tools and technologies, "the teachers to

whom the technologies were being demonstrated were struggling to see how they operated, let alone how they might be incorporated" (p. 222).

This could possibly relate back to Prensky's (2001) theory that today's students are "digital natives" having grown up with today's technology while today's instructors are better defined as "digital immigrants" who have not benefited from being immersed in technology from an early age, but have instead grown accustomed to it. It could also simply be a symptom of inadequate training of teachers on current and new technological systems implemented in the classroom. It is important to note that some of the teachers in Tan and McWilliam's (2009) study were concerned with programs that may require too much (technologically) from disadvantaged migrants in order to guard against failure. Yet, the students referred to in the study were observed using current technology such as iPods to transfer and share music between each other within their first language.

This difference in technological culture adds a barrier to the learning process and could even be defined further as differences in technological accents; such as printing off emails (Prensky, 2001). The "digital immigrants" can retain prior knowledge and practices from earlier technologies that act as technological communicative barriers between themselves and their students. Perhaps supported and seen within Murray's (2008) research that found that teachers tend to limit their use of technologies to emails, web searches, word processing, and PowerPoint presentations. However, many of the learners were unfamiliar with these technologies and teachers found they needed to also teach the learners computer and electronic literacy as well. In fact, teachers were often "ignorant of the factors that increase or decrease readability of

webpages" and did not take those facts into account when selecting websites for learners. Instead they focused solely on the objectives outlined in their curriculum (p. 27).

Additionally, some schools still hold to old ideals and cultures related to technological use within the classroom. This "rigidity of a school's programming" (p. 222) and its "long term entrenched educational culture in paper- based [learning]" (p. 219) act as a barrier (Tan & McWilliam, 2009). Indeed, education institutions and instructors tend to hold out on incorporating new technologies and theories for fear of failure. Students in Murray's (2008) research had similar struggles in which they typically felt an inner conflict between being "digital students" and "diligent students". Tan and McWilliam's (2009) paper echoes the sentiments held in Murray's research. Students often took the safer route in learning and instead opted to "guard against failure rather than look for innovative ways," (p. 219) to produce language skills and expand their own personal capacities (Tan & McWilliam, 2009). Likewise, one instructor in Wray et al's (2008) study reported "in online I get a lot more students who are hesitant in their answers in the questions I pose." (p. 246).

Another issue that exists within the educational community is perhaps best outlined in Larry Cuban's book *Oversold and Underused: Computers in the Classroom*. In the book, Cuban described one institution, in this case Stanford, who invested millions of dollars for a fully furnished television studio that was "State of the Art" as well as a large group instruction room. In the case of the large group instruction room, students each had control panels at their desk in which they could manually depress buttons to answer yes, no, or a particular number in answer to a professor's question (Cuban, 2001). However, Cuban found that in essence the button on the student desks acted as a mere gimmick in which it was grossly underutilized. In fact, when it

was in use, professors used it mainly as a means to check the pulse of the class and ensure that

material was not being covered overly fast. This multimillion dollar investment was outdated,

and mainly unused in less than 10 years from its initial build. When researching what caused the

facility to decline and be underutilized, Cuban found through communications with staff and

faculty that few, if any, were a part of the design process, and that a very minor amount of the

staff actually used the technology when it was available and running (Cuban, 2001). In essence,

the administration spent all of this time and money on what they saw as a "state of the art"

facility, and then told the faculty to use it. However, when it came to the faculty, no training was

provided, the initial support staff that was hired on for the equipment was soon let go due to

budgetary issues, the technology often broke down, and the technology quickly became outdated

(Cuban 2001).

The Three Philosophies

Since the 1960s, the use of CALL and research performed can roughly be divided into

three philosophies in which Warschauer and Healey (1998) term: Behavioristic CALL,

Communicative CALL, and Integrative CALL. There are definite overlaps in each of the three

schools of thought, but typically they followed the technology available at the time starting with

Behavioristic CALL. Behavioristic CALL started around the 1950s, continued on into the

1970s, and followed the behaviorist learning model where language learning and CALL focused

on "drill-and-practice" (Warschauer & Healey, 1998). The computer was seen as more of a

tutoring tool and ran on the most well-known system at the time PLATO (a mainframe based

computer).

As times changed, so did technology and theories concerning language learning. In the late 1970s, and early 1980s, Communicative CALL emerged. Communicative CALL, as outlined by Warschauer & Healey (1998), held to the mindset that the CALL activities "should focus more on using forms than on the forms themselves," as well as "teach grammar implicitly," and "encourage students to generate original utterances rather than manipulate prefabricated sentences" (p. 57). This was directly tied to cognitive theories at the time that promoted learning as a "process of discovery, expression, and development" (p. 57). In this time period, Communicative CALL was focused more on the use of the personal computer.

However, despite many feeling that Communicative CALL was a step forward from Behavioristic CALL, many felt that Communicative CALL did not take full advantage of the language learning process. Teachers began moving towards a more socio-cognitive view of the language learning process and began focusing on language learning, and its use in authentic social situations (Warschauer & Healey, 1998). This new perspective was called Integrative CALL, and came about in the early 1990s. It focused on task, project, and content based interactions that sought to have learners use, and learn, language within authentic environments. The goal was not simply to have language learners use the technology a finite amount of time but, to instead, impress upon them the use of technological tools as an integrated component of language learning. Integrative CALL sought to take advantage of the versatility that computers had become known for and focused on the various forms of media that networked computers and the internet were able to provide.

Today's technology use in language learning has come a long way since its inception. Computer systems are able to give immediate feedback on their performances due the

technology's ability to analyze captured data and present its findings to students. This feedback is both essential and critical for students and instructors. However, Lai and Kritsonis (2006) point out, despite these advances, CALL is still relatively imperfect. In the realm of language learning, unexpected situations are present to which computers and technology are limited (Lai & Kritsonis, 2006). A computer cannot react to unexpected learning problems or address questions or issues that may arise with the learner as effectively, efficiently, or as timely as an instructor (Lai & Kritsonis, 2006). Lai and Kritsonis (2006) point out that only by realizing these advantages and disadvantages, that present themselves in CALL, are we able to "avoid for misemploying CALL programs and get its maximum benefits." (p. 4). One could argue that, without instructor feedback, the advantages and disadvantages of programs could remain shrouded or even defined incorrectly. A prime example can be found in Tan and McWilliams' (2009) instructors who felt pushing their students technological use could be detrimental, yet their students were showing their technological capacity at the same time contrary to the teachers' misgivings. As was the case here, the instructors' perceptions of technology in the classroom were wrong but also highlighted an issue within their classrooms and their mindsets.

It was not until the late 1970s, or early 1980s, that much thought was given to teachers' beliefs and how they could shape and mold the classroom. In his 1979 article, Fenstermacher outlined three criticisms of research and teacher work. More specifically, Fenstermacher (1979) focused on the third kind of criticism, "apparently significant [criticism], [that] cannot be heeded because the remedy is unknown or because its implications are the shop must be closed and a new calling found." (p. 157). He opined that much of the research conducted in education up till then (1979) relied heavily on a philosophy of science, but was inherently limited as it does not

effectively add to the understanding of research in, and on, education (Fenstermacher, 1979). His suggestion of borrowing from the social sciences to more effectively analyze classrooms, and educational systems (which are social systems), was one of the earlier suggestions and predictions that research focus on teacher beliefs in the classroom (Fenstermacher, 1979).

From then on, more educational research was conducted with a social sciences approach not merely a critical analysis of programs and their effectiveness with control and experimental groups. Researchers started looking at other factors within the social system of the classroom that could affect teaching practices. Pajares (1992) states that it is generally agreed upon the educational beliefs of teachers have a tendency to shape and guide their own personal practices. Golombek's (1998) research echoes this statement as well in which it was pointed out that the beliefs largely determine how, and why, it is that teachers come to adopt new methods in teaching. Kadel (2005), through a review of literature, often found in order for teachers to effectively utilize technology and integrate it into the classroom, teachers must put forth an investment of time and energy, have a belief centered on the premise that what they do as teachers can affect their student outcomes (Kadel, 2005; Ertmer & Ottenbreit-Leftwich, 2014), and hold a general openness to change that technology in the classroom requires. Additionally, teachers must not only have knowledge of technology itself (Ertmer & Ottenbreit-Leftwich, 2014) but must take into account effective ways to use that technology and integrate it into their lesson plans, or vice versa, integrate their lesson plans with the technology. Teachers also generally have two competing mindsets of the classroom: teacher-centered learning and student-centered learning, which can also affect their level of technology integration in the classroom (Kadel, 2005).

However, there are issues with identifying the beliefs themselves. Pajares (1992) found that, often, teachers' beliefs must be inferred through research. This can be seen by an example within Golombek's (1998) research where one of the teachers, identified as "Jenny", felt that she should correct students' pronunciation, but also felt that such a correction could lead to the effective shut down of said student's participation. These clashes between beliefs and practice add a sort of difficulty in which teachers, whose beliefs don't necessarily fall in line with their typical classroom practices, must face. It also adds a difficulty for researchers as well who either observe or solicit opinions of teachers' belief systems. That clash between belief and practice is a common one faced by teachers. However, it's also been shown that teacher beliefs and classroom practices can, and are, influenced by other factors: the culture of the school and administration and the subject matter being taught (Ertmer & Ottenbreit-Leftwich, 2014).

Research Questions

The study will address the following research questions.

1. What do MA-TESL Graduate students report about their perceptions of computers and technology

2. What do MA-TESL Graduate students report concerning their affinity towards computers and technology?

3. What do MA-TESL Graduate students report concerning their use of computers and technology?

Chapter III: Methodology

The following chapter contains descriptions of participants who took part in the survey and interview subgroups, the instruments involved in both groups, and the procedures followed for both.

Participants

For this study, the pool of participants was students of a Midwestern university TESL Graduate Program. Some of these graduate students teach for the university as Graduate Assistants. Demographic information of the participants was collected as part of the survey. There were 15 participants who took part in the survey. For hereon forward, this group will be referred to as the "survey group." Of these 15 participants, 4 took part in an interview on top of the questionnaire. This subgroup will be referred to as "interview subgroup."

Survey group. There were 15 participants in the survey group. The survey was open for participation from all individuals currently enrolled in the Midwestern university MA-TESL program.   All of them listed graduate school as their highest level of education, with one having previously achieved another Master of Arts in a different program. Five of the individuals reported as being from the United States and the remaining 10 reported being from the following countries: Argentina (1), El Salvador (2), Mexico (1), Moldova (1), Puerto Rico (1), Russia (1), Somalia (1), South Korea (1), and South Sudan (1).   These numbers are represented in Figure I.

Participants By Reported Native Country
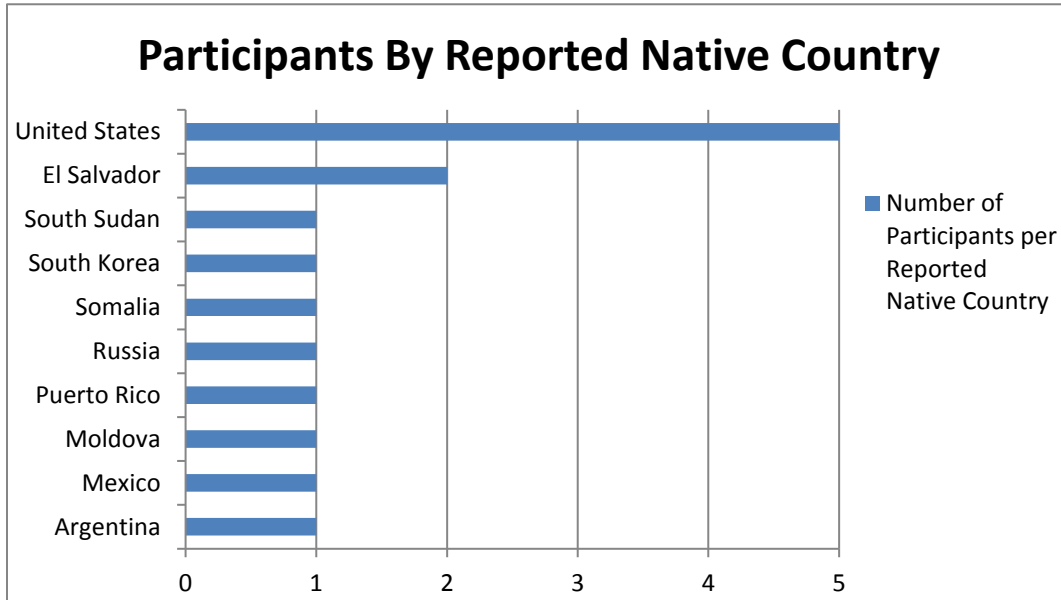
Figure I. **Demographics: Native Country of Participants**

The participants ranged in age from 24 to 32 years old, with a mean of 27.667 years of age. Female participants outnumbered the males with 12 reported as female and 3 reported as male.

Table I

Demographics: Age of Participants

Youngest Participant	Oldest Participant	Mean Age	Standard Deviation
24 years of age	32 years of age	27.667 years of age	2.6095 years
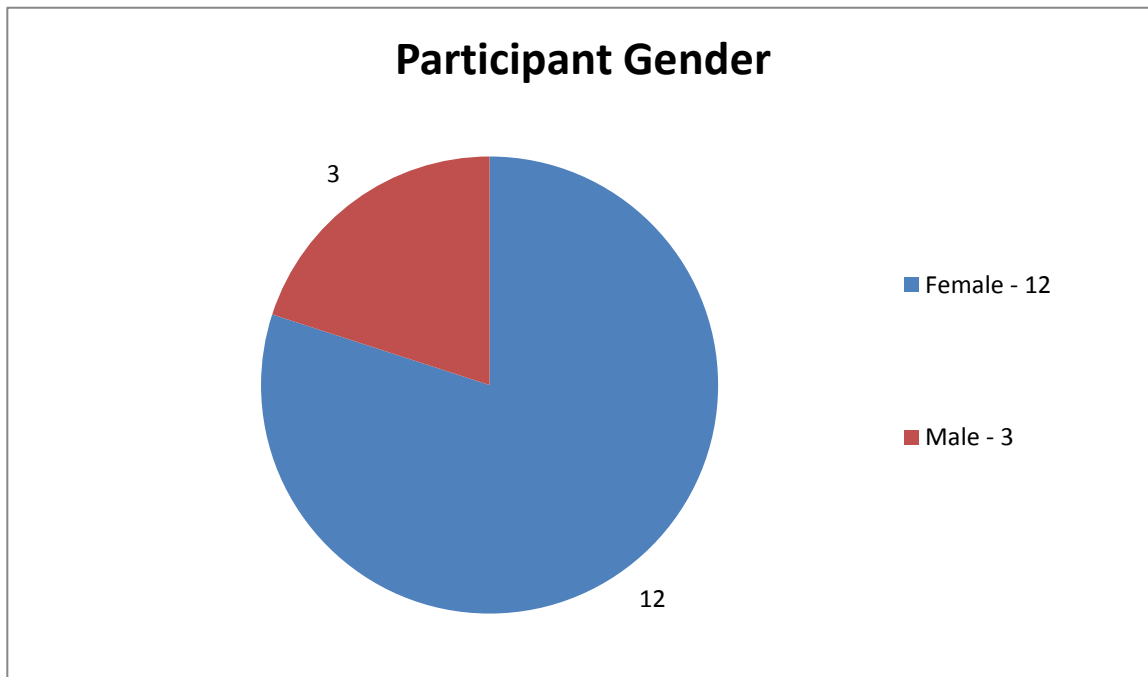
Figure II. **Demographics: Participant Gender**

The group ranged in their prior teaching experience. The longest period of time anyone taught was 10 years, and the shortest was 6 months. The mean of years spent teaching was 3.76 years with a standard deviation of 2.76. Figure III shows the dispersal of the participants based on how many years they reported teaching. As can be seen, the one participant who taught 10 years is a definite outlier and aids in the large standard deviation.
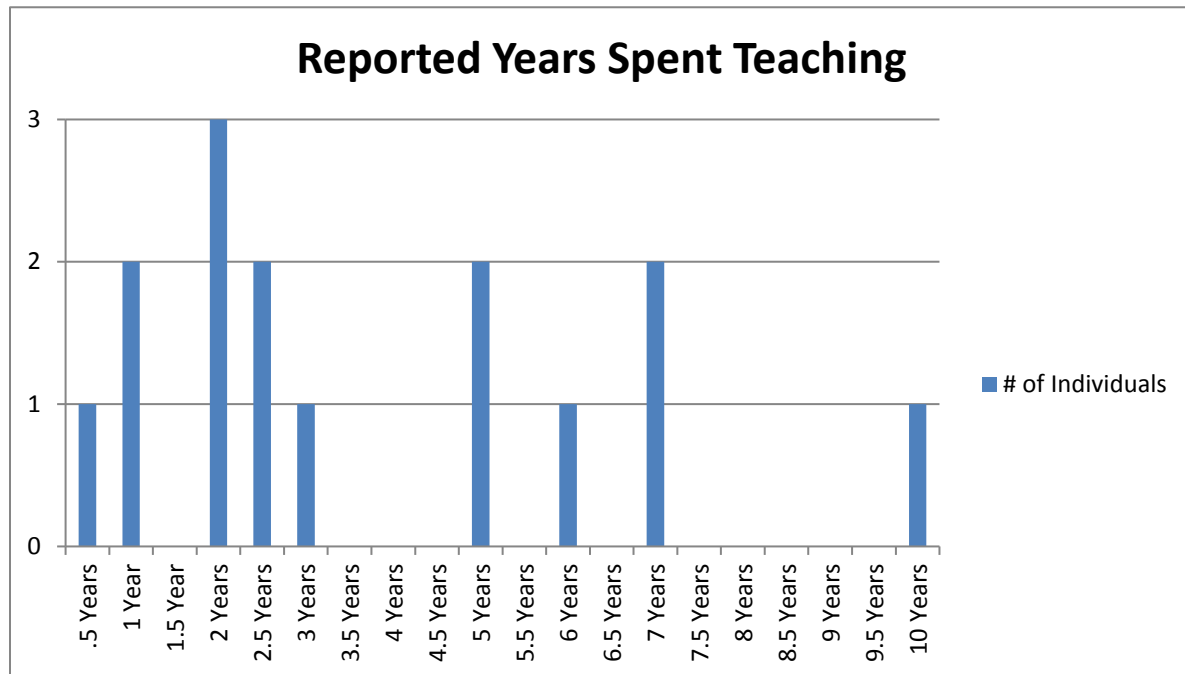
Figure III. **Demographics: Teaching Experience**

For the participants, the years reported as using a computer had a maximum of 20 years

and a minimum of 9, with an overall mean of 17 years of computer use, and a 3.84 standard

deviation. Internet use was nearly identical with a maximum of 20 years and a minimum of 9.

However, the mean number of years using the internet was slightly lower with 15.93 years of

internet use and a standard deviation of 3.51.

Table II

Demographics: Computer and Internet Use (in Years)

	Maximum	Minimum	Mean	Standard Deviation
Lifetime Computer Use	20	9	17	3.84
Lifetime Internet Use	20	9	15.93	3.51
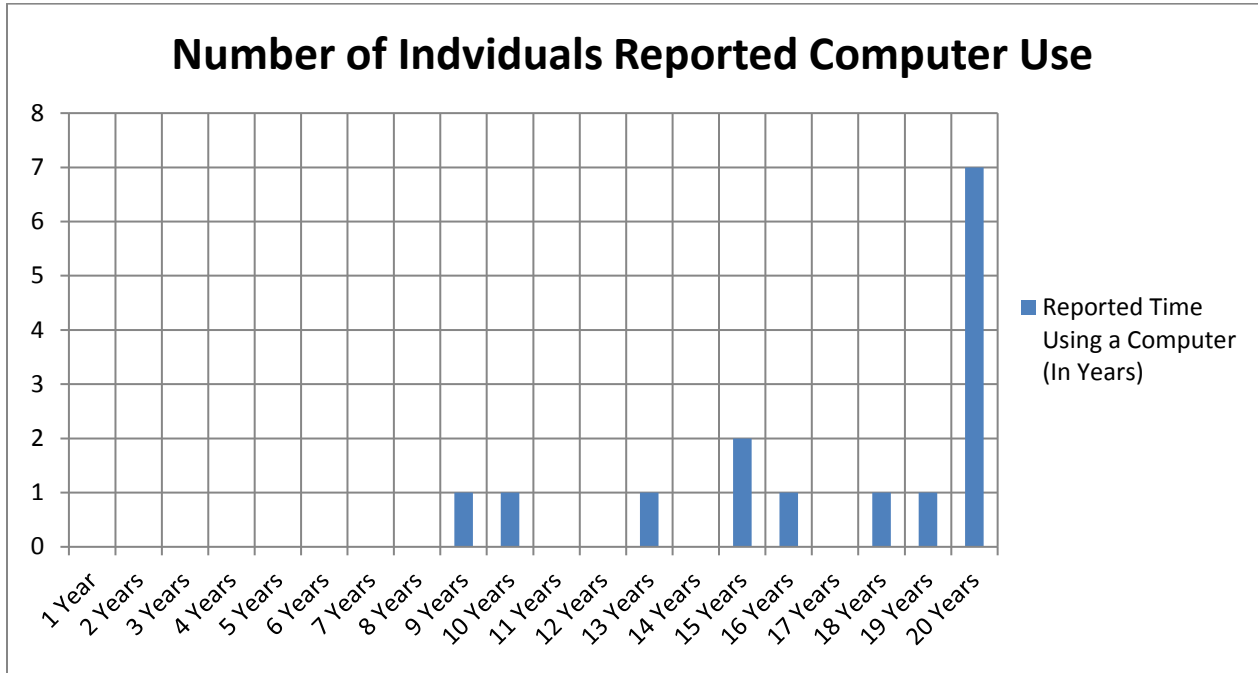
Figure IV. **Demographics: Years of Computer Use**
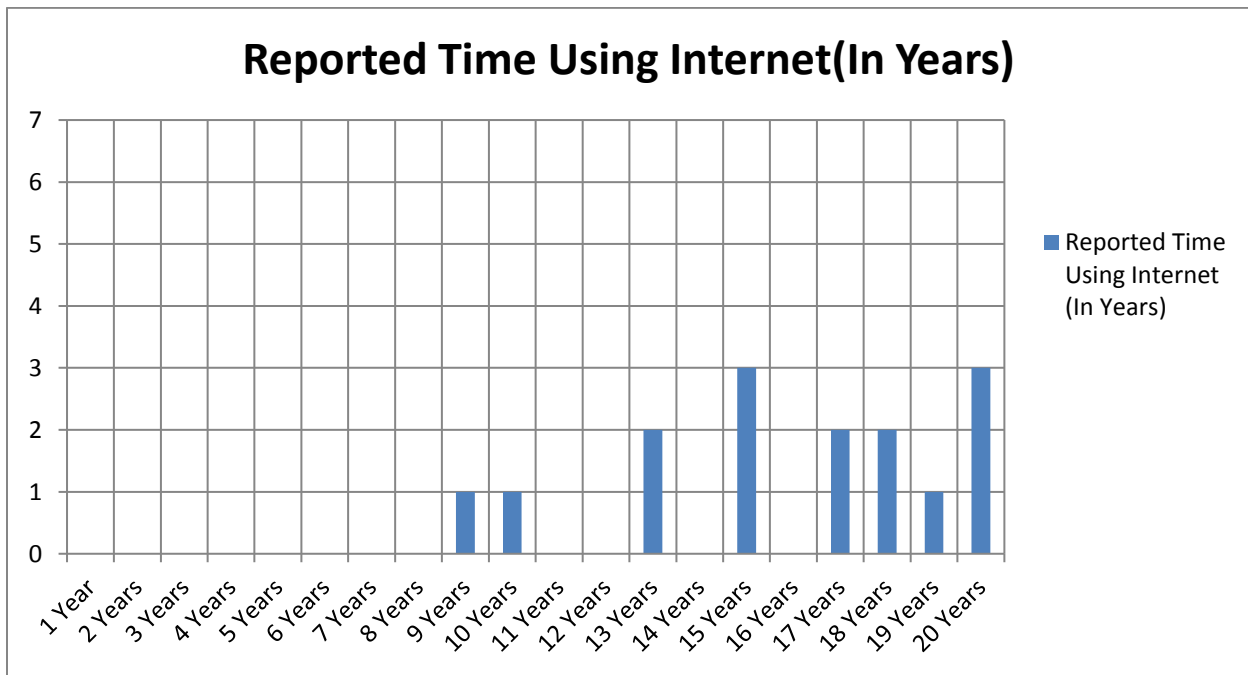
Figure V. **Demographics: Years of Internet Use**

Participants were asked what they reported as their first language. Figure VI shows the breakdown of participants' first language. Spanish was the most common first language with 4 reported participants. English was the next first language with 3 reported participants closely followed by two participants who marked English/Somali as their first language. Since both marked English/Somali as their first language and there are bilingual homes, it was decided to consider this as its own first language.

Reported First Language

First Language	Number of Participants
Korean	1
Hmong	1
Russian	2
English/ Somali	2
English	3
Spanish	4
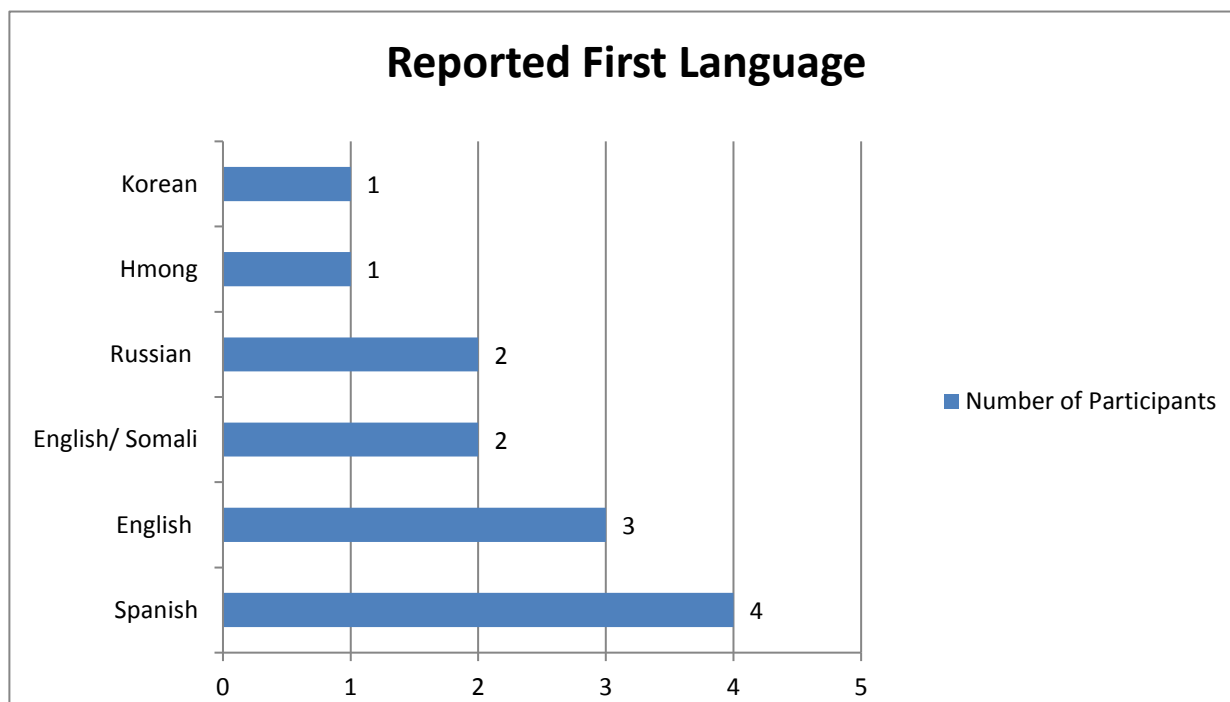
Figure VI. **Demographics: Participants' First Language**

Interview subgroup. Each of the 15 survey participants was invited to take part in the interview. Out of the 15 participants, 4 volunteered to take part in the interview. Three participants of the interview subgroup were female and the other participant male. No identifying information was collected however; there is a possibility that by matching interviewee with their survey identifying factors could be present. Therefore, in order to protect

participant anonymity, no further demographics were collected outside of the interview

questions. Their surveys were not collated with their interviews as well. Participants of the

interview subgroup are identified as: Participant 1, Participant 2, Participant 3, and Participant 4.

Instruments

      Survey. The 15 participants all took a paper-based survey. An identical digital based

survey was offered as well to online students but saw zero returns. The survey can be found in

Appendix I.

      The survey is broken down into three sections. Section I focused on the collection of

demographic information through 11 open questions and 5 closed Yes/No questions. The

information collected included country of origin, gender, age, highest level of education, years

spent teaching, years of computer use, years of internet use, computer access in home, internet

access in home, familiarity with CALL, interest in CALL, and utilization of CALL in their

classroom.

      Section II was comprised of two closed yes/no questions as well as 4 open questions

pertaining to participants' possible prior use of a computer to learn a language. This was

included as not all individuals within the MA-TESL program at the Midwestern University are

native English speakers. Even if English is their native language, participants may have used

some form of CALL to aid them in the acquisition of another language. This could conceivably

alter their perceptions and/or use of CALL in their own classrooms as instructors.

      Section III consists of 94 Likert questions that participants marked their answer as 1-6

with: 1=Strongly Agree, 2=Agree, 3=Slightly Agree, 4= Slightly Disagree, 5= Disagree,

6=Strongly Disagree. Within Section III, the questions can be attributed to three different

categories: Perception of computers and technology, instructor affinity for computers and technology, and instructor's use of computers and technology in the classroom. Each question has a positive and negative phrasing to aid accuracy. The questions comprised of 47 positively phrased, and their matching 47 negatively phrased counterparts. This was done to reduce acquiescent bias and to reduce extreme response bias. Acquiescent bias is when an individual tends to agree to all statements; in the case of this survey it would be 1 or 2. Extreme response bias is when participants only answer at the extreme ends of each spectrum, in the case of this survey, 1 or 6. Questions were placed randomly so the positive and negative phrasings to each question are not situated one after the other.

The following table matches the positive and negative questions with each other, as well as sorts the paired questions to the category they belong.

Table III

Positive & Negative Paired Questions Sorted by Category

Perceptions of Computers		Affinity for Computers and Technology	Use of Computers and Technology in the Classroom
#1 - #55	#48 - #93	#10 - #61	#13 - #59
#2 - #50	#53 - #9	#11 - #54	#15 - #83
#3 - #65	#57 - #40	#24 - #56	#25 - #72
#4 - #20	#58 - #33	#26 - #52	#29 - #75
#5 - #16	#60 - #14	#32 - #68	#47 - #94
#8 - #79	#63 - #6	#38 - #78	#49 - #92
#17 - #62	#67 - #91	#43 - #80	#52 - #34
#19 - #73	#74 - #27	#44 - #82	#66 - #39
#21 - #7	#76 - #22	#46 - #86	#85 - #31
#23 - #69	#77 - #22	#64 - #36	#88 - #41
#30 - #71	#81 - #18	#70 - #28	#89 - #45
#35 - #87	#90 - #42		
#37 - #84			

Interview. Individuals who participated in the survey were invited to take part in an interview. It was a semi-structured interview comprised of 6 questions which can be referenced in Appendix III. An interview was chosen for two different reasons. First, due to the relatively low initial starting pool of possible candidates that took part in the survey, and secondly, it has been interesting to see unsolicited comments teachers and instructors have offered in previous studies and questionnaires. Due to the aforementioned unique insights, an interview was also conducted among the graduate students who took part in the survey. The addition of the interview was to allow unique insights into the classrooms and technology use within them.

Procedures

Survey. Participants were invited to take the survey at two different locations throughout a 6 day period in which the researcher reserved rooms. Instructors of the graduate students allowed the researcher access to make an announcement and disseminate information as to the title, goal, and instruments of the research thesis. When a participant entered, they were given a consent form, explained the purpose of the study, and explained the different sections of the survey. Time of completion of the survey ranged between 10-20 minutes and after completion, surveys were collected by the researcher.

Interview. Participants of the interview volunteered earlier during the survey phase of data collection. The participant sat down with the researcher and the audio was recorded on a Sony voice recorder while going over the interview questions in a semi-structured interview. Interviews ranged from 8-17 minutes and no time limit was given on participants' answers. The semi-structured interview was chosen so that the researcher could ask follow-up questions, or ask for clarification.

Chapter IV: Results

The following chapter contains the results of this research. The chapter is broken into eight sections. The first seven sections are breakdowns of information found while compiling the data. The last section is a summary of the findings found in the research in terms of the research questions.

All 15 participants reported having computer access at home with 13 reporting they had internet access at home. Participants reported using computers and internet for a wide range of activities listed below.

Table IV

Reported Computer and Internet Use Activities by Number of Participants

Research	11	Listen to Music	2	Online Dictionary	1
Teaching Resources	8	Shopping	2	Ted Talks	1
Social Networking	8	Reading	2	Google Drive	1
Watch Videos/Movies	7	Entertainment	2	D2L	1
Typing Papers and Homework	4	Surfing the Internet	2	Blogging	1
PowerPoint	3	Education	1	Banking	1
News	3	Traveling	1	Errands	1

When asked what they use for programs, technology, and software in the classroom participants' responses are logged in Table V. PowerPoint, with 9 responses, was the number 1 answer. The second response was "websites". In many cases, participants actually listed off specific websites they used for teaching, but for the sake of brevity they were combined into one

category. Among the websites listed were: Ted Talks, Blackboard & Learn, Crossword

Generator, Kahoot, and Prezi. YouTube was not added into this list. While technically a

website, it is generally for audio and video.

Table V

Reported Technology Participants Used in their Classroom

PowerPoint	9	Media Player	3	Smartboard	1
Websites	8	Textbook Companion	2	CD's	1
D2L	8	Computer	2	iPad	1
YouTube	5	Projector	2	Speaker	1
Microsoft Office	5	Audacity	2	Adobe	1
Internet	4	Blackboard Learn	1	Blogs	1
Google Docs	3	Songs	1		

In an effort to gauge their interest and knowledge of the topic, participants were asked if

they were familiar with the term CALL (Computer Assisted Language Learning), if they were

interested in CALL, and if they utilize CALL in their classroom. Of the participants, 10 were

familiar with the term, 14 were interested in it, and 10 reported utilizing CALL in their

classroom. Additionally, participants were asked if they have used a computer in the past to

learn a language with 11 confirming prior computer use for language learning. The number of

participants per reported language follows in Table VI.

Table VI

Participant Reported Languages Learned with a Computer

Participant Reported Languages Learned with a Computer			
English	5	Thai	1
Arabic	3	Czech	1
French	3	German	1
Spanish	2		

Table VII shows the number of participants per reported internet and computer program that was utilized to learn a language.

For the sake of brevity, Table VII was condensed down into similar categories. For instance, Online Language Learning Websites varied based on which language the participants were learning. Participants listed off the following sites for Online Language Learning Websites: Goldstone, Rosetta Stone, Madinah Arabic, Language Avatar, Duo Lingo, Mango, Live Mocha, learnquran.com, and Lingua Leo. Of interest, each of the four individuals that listed YouTube mentioned watching the videos with Closed Captioning turned on in order to help them learn a language.

Table VII

Internet and Computer Programs Used to Learn a Language

Participant Reported Internet and Computer Programs Used to Learn a Language			
Online Language Learning Website	11	Phone Applications	1
YouTube	4	Ted Talks	1
News	2	Children's Software	1
Online Dictionary	2	Microsoft Word	1
TV Shows	2	Podcasts	1

Of those 11 who reported having used a computer to learn a language, 9 of them reported enjoyment while doing so.   Table VIII shows how many participants reported, and what they reported, enjoying about using computers and technology to learn a language.

Table VIII

What Participants Reported Enjoying While Using Computers

and Technology to Learn a Language

Convenient/ Easily Accessible	3	Easier (than just using a book)	1
Can Hear Pronunciation	2	Quicker	1
Visual Aids	2	Fun	1
Work at Own Pace	2	Interactive	1
Interesting	1	Free	1
Engaging	1	Learning Oral Skills	1
Amount of Resources Available	1	Can Practice a lot	1

Table IX shows how many participants reported, and what they reported, about what they did not enjoy when using computers and technology to learn a language.

Table IX

What Participants Reported Not Liking about Using Computers

or Technology to Learn a Language

Technical Difficulties	3	Tedious Repetition	1
Prefer Face-to-Face Interaction	2	Lack of Focus on Specific Areas	1
No Way to Know if Pronunciation is Correct	2	Non-linguistic Focus	1
Eyes tire	1	No Accountability	1
Shorter Retention	1	No Communication	1
Too Much Time Spent Online	1	Strictly Receptive Skills not Productive	1
Nothing	1		

Prior to reverse weighting the negative phrased questions, the number of times individuals selected a specific response are listed below in Figure VII. This was done to see if the participants had relatively even distribution across their responses. As can be seen, the responses are relatively balanced with Response 2 (Agree) having a slightly larger share of the number of responses.
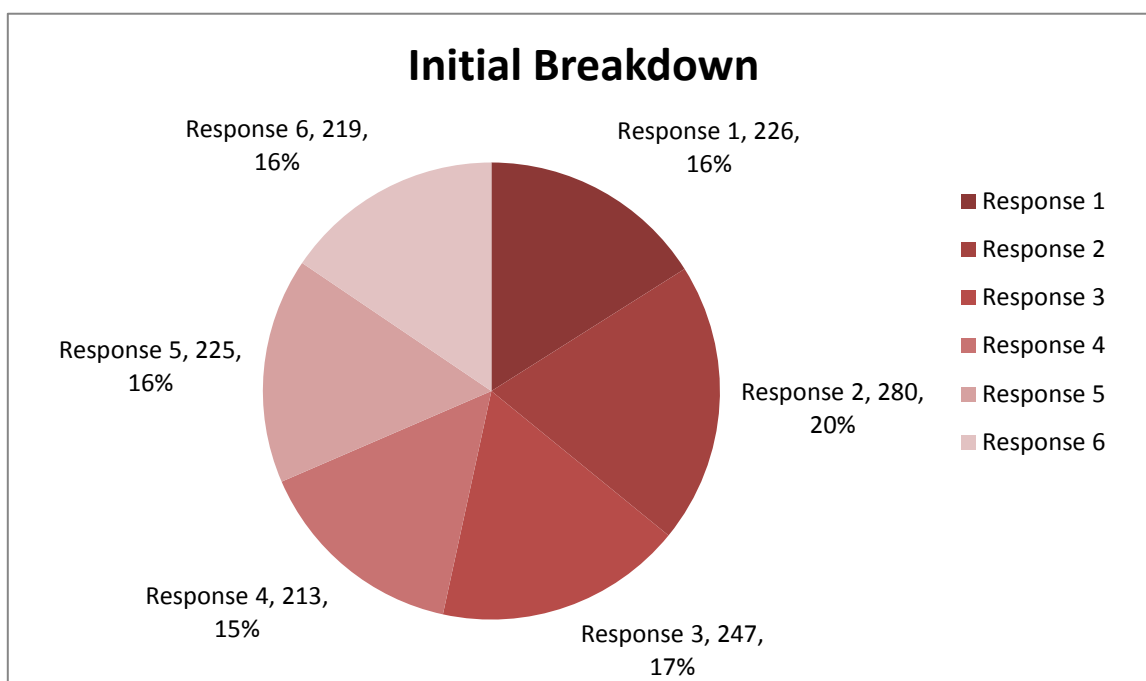
Figure VII. **Survey Section III Initial Breakdown of Responses**

After the negative answers were switched for weighting, the number of times individuals selected specific answers is shown in Figure VIII. The negatively phrased questions were reverse scored. The mean score between the positive and newly weighted negative phrased

questions were then calculated. This shows that Response 5 (Disagree) was the most commonly

selected answer on the Likert Scale, covering 22% of the answers from Section III.

This was closely followed by a 21% selection of both Response 6 (Strongly Disagree) and 21%

selection of Response 1 (Strongly Agree).
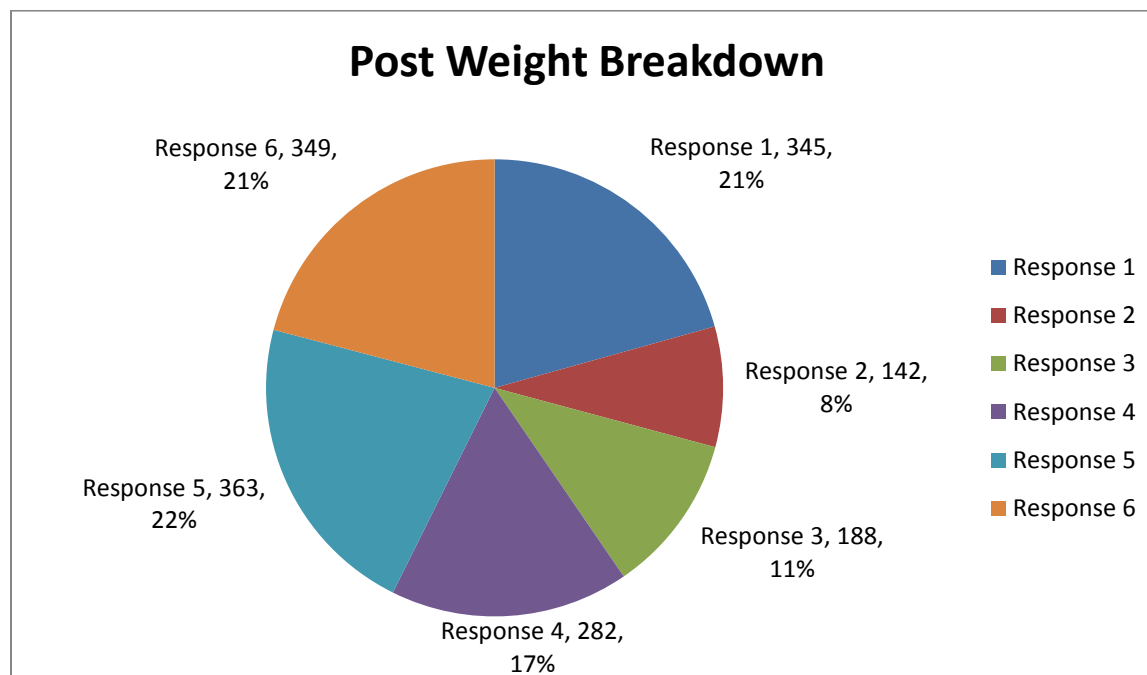
Figure IX. **Post Weight Breakdown of Survey Section III**

Participants' responses to each question of the pair were averaged, and then those

responses were compiled together with the rest of the participants' responses in order to get an

aggregate mean of the response per category in terms of Perceptions of Computers and

Technology, Affinity for Computers and Technology, and Use of Computers and Technology in

the Classroom. As mentioned earlier the scores were on a 6-point Likert where: 1=Strongly

Agree, 2=Agree, 3=Slightly Agree, 4= Slightly Disagree, 5= Disagree, 6=Strongly Disagree. In

Figure IX, a mean score of less than 3.5 indicates a general positive agreement of the positive

statements within each category. The closer to 1 (Strongly Agree) that participants reported,

indicated the stronger level of agreement they had with the statement. The closer to 6 (Strongly

Disagree) that participants reported, indicated the stronger level of disagreement they had with

the statement.
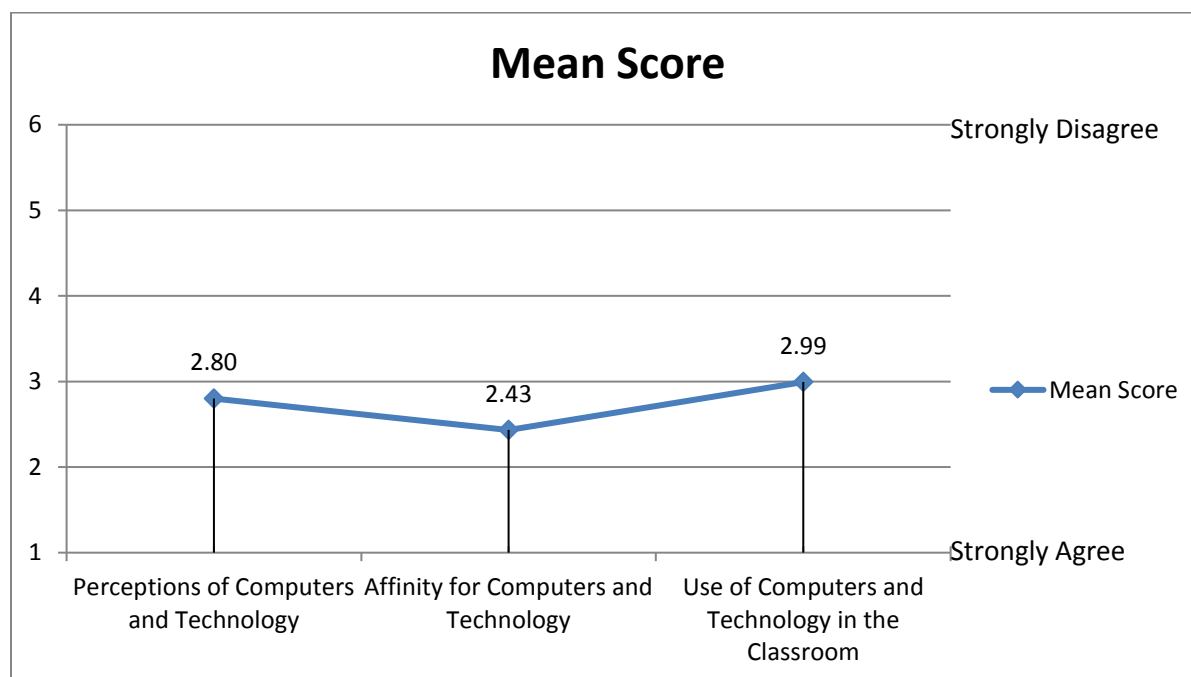
Figure X. **Mean Scores of Survey Section III per Category**

Perceptions of Computers and Technology

As stated earlier, the overall mean response to the questions pertaining to Perceptions of

Computers and Technology was 2.8 with a standard deviation of 0.42.

Table X shows (post negative weighting) participants mean score, standard deviation, and

the range of the answers pertaining to participants' perceptions of computers and technology. A

single participants' score between the paired questions was computed as a mean after reverse

weighting the negatively phrased question, and then aggregate mean across all participants was computed. For example, if a participant answers question #63 with a 1 and question #6 with a 6 the score would be computed as an individual mean of 1. Standard deviation was calculated to show whether participants held a general agreement of their answers to a survey question. Range was also calculated between the answers to show differences between the max score found on a question and the minimum score as well. Range was selected due to the possibility of having a low standard deviation but a long range owed to an outlier.

Of the questions within the Perceptions of Computers and Technology category, paired questions 63 & 6 had the lowest standard deviation. In other words, participants agreed with each other more than any other question when answering this pair of questions. When accounting for questions 6's negative phrasing, and flipping the weighting of that question, the mean score is 2.87. Participants Slightly Agree/Agree with the positive phrasing of question 63.

Question 63: Computers and technology make lesson planning easier for teachers.

Conversely, within the Perceptions of Computers and Technology category, paired questions 74 & 27 had the highest standard deviation. In other words, participants mostly disagreed with each other when answering this pair of questions.

Question 74: I prefer the traditional face to face language class versus online language classes.

Interview question number 1 and interview question number 4 were designed to help shed some light on participants' perceptions as well. As stated earlier, 4 participants took part in the interview section of the research and were asked to describe their personal philosophy of technology in the classroom, as well as how technologically savvy they felt they were.

Table X

Perceptions of Computers and Technology Paired Question Scores

Paired Questions	Positive Phrased Statement	Mean	Standard Deviation	Range
#1 - #55	The use of CALL (Computer Assisted Language Learning) makes learning easier.	2.37	0.9348	3.5
#2 - #50	Computers and technology promote student motivation to learn.	2.20	1.0987	3.5
#3 - #65	Computers and technology promote student centered learning.	2.90	0.7838	2.5
#4 - #20	Computers and technology present more opportunities for better language practice.	2.73	1.1159	4.0
#5 - #16	Computers and technology promotes student autonomy	2.77	0.9796	3.5
#8 - #79	The use of computers and technology improves student performance.	3.33	0.7715	3.0
#17 - #62	I believe that social media should be utilized in the language learning classroom.	2.67	1.2344	4.0
#19 - #73	I would enjoy using a computer or video game as a teaching tool for language learning.	2.83	1.3318	5.0
#21 - #7	Computers and technology are easy to use for instruction	2.30	0.8194	2.5
#23 - #69	Computer and video games are fun.	2.87	1.2743	5.0
#30 - #71	Social Media (while focused on entertainment and socializing) can be utilized for other such goals such as education in the language learning classroom.	2.40	1.0724	3.5
#35 - #87	I would enjoy using Social Media for language learning.	2.80	1.4491	4.0
#37 - #84	I believe that the use of social media in a language learning classroom would be beneficial.	2.57	1.1782	3.5
#48 - #93	Social media applications and sites are fun.	2.43	1.1782	4.0
#53 - #9	Computers and technology decrease time spent lesson planning.	2.67	0.7237	2.5
#57 - #40	Computers and video games should be utilized in language learning classrooms.	2.90	1.2845	4.5
#58 - #33	Language learning courses should have an online element to them.	2.37	0.9612	3.0
#60 - #14	Computers and technology help promote student interactions.	3.47	1.2169	4.5
#63 - #6	Computers and technology make lesson planning easier for teachers.	2.87	0.6935	2.0

#67 - #91	My personal teaching philosophy promotes computer and technology use in instruction.	2.50	1.0177	3.5
#74 - #27	I prefer the traditional face to face language class versus online language classes.	2.30	1.6345	5.0
#76 - #22	I believe that language learners would enjoy online learning.	2.93	0.9976	3.5
#77 - #12	Computers and technology use in the classroom is an important use of instructional time.	2.87	0.9904	3.5
#81 - #18	I would enjoy teaching an Online Only Language Course.	3.80	1.3732	5.0
#90 - #42	Computer and video games can be used for other goals such as education in the language learning classroom.	3.80	0.8194	3.0

Note: Aggregate Mean = 2.80

Participants' Philosophy

When asked about their personal philosophy of technology in the classroom, 3 of the 4 participants hesitated. They all seemed to face the question as if it were a delicate subject. They each chose their words carefully. The three responses were:

Interviewee #1: "Only use when necessary"

Interviewee #2: "Can be useful when integrated with learning objectives"

Interviewee #4: "Can be useful but first must understand goals of using it and have

proper training"

Each of the 3 participants felt that there was an inherent caveat built into the question that needed to be addressed. Interviewee #3 self-identified as "very pro technology in my personal and professional life." The interviewee even lit up and was excited while describing their frequent uses of technology in the classroom, and giving various examples of its use.

Also of note is interview question number 6, in which the participants were asked if there was anything further they would like to share concerning technology use in the classroom or this study. In this case, Interviewee 4 expounded on their personal philosophy of technology.

Interviewee 4: "I just think technology is not good or bad. I think it's whether your plan is good or bad. It can be really helpful but you have to know when and where to use it and if not you could end up making a mess of what you want your students to do. Ultimately, everyone needs training on how to use technology."

Technologically Savvy

As part of the interview, the 4 participants were asked to self-identify on how technologically savvy they felt they were. This was also chosen as a means to help derive individuals' perceptions of computers and technology as well as their affinity towards them. The participants' answers in regards to how technologically savvy they felt they were personally are listed below.

Interviewee 1: "not great but not that old to (not) know what it is."

Interviewee 2: "I get frustrated with technology. Once I learn it I learn it but need someone to explain it to me."

Interviewee 3: "very tech savvy. I'm very pro-technology and whenever a new program of software comes along I learn it easily. I even sleep with cell phone under my pillow."

Interviewee 4: "I'm not (technologically savvy). As the older I get, the less I get

(understand) I think. I'm generally familiar with things but don't know

many of the features."

Affinity for Computers and Technology

The second category that Section III of the survey measured was Affinity for Computers and Technology. The aggregate mean score was 2.43 with a standard deviation of 0.48.

The following table shows (post negative weighting) participants mean score, standard deviation, and the range of the answers pertaining to participants' Affinity for Computers and Technology. A single participants' score between the paired questions was computed as a mean after reverse weighting the negatively phrased question, and then aggregate mean across all participants was computed. For example, if a participant answers question #63 with a 1 and question #6 with a 6 the score would be computed as an individual mean of 1. Standard deviation was calculated to show whether participants held a general agreement of their answers to a survey question. Range was also calculated between the answers to show differences between the max score found on a question and the minimum score as well. Range was selected due to the possibility of having a low standard deviation but a long range owed to an outlier.

When examining the data within this category, participants agreed with each other when answering paired questions 64 & 36 more than any other question. With a standard deviation of 0.9063 and a mean score of 3 participants "Slightly Agree" with questions 64.

Question 64: People often come to me for help with a new computer, a new technology, or a new software.

The greatest amount of disagreement between participants' answers occurs with the question pair of 43 & 80. This can be seen in Table XI with a standard deviation of 2.2077 and a mean score of 3.13 towards the positive phrasing of question 43.

Question 43: I have taken an online course before.

Table XI

Affinity for Computers and Technology Paired Questions Scores

Affinity for Computers and Technology				
Paired Questions	**Positive Phrased Statement**	**Mean**	**Standard Deviation**	**Range**
#10 - #61	I am comfortable using computers.	1.97	1.1255	3.0
#11 - #54	I am able to learn and use new software and technology quickly.	2.33	1.1751	3.5
#24 - #56	I own a smartphone.	1.57	1.3075	5.0
#26 - #52	I have had adequate training for use of computers and technology in the classroom.	2.83	1.0118	3.0
#32 - #68	I use social media all the time.	2.37	1.6088	5.0
#38 - #78	I have played computer of video games before.	2.13	1.1872	4.5
#43 - #80	I have taken an online course before.	3.13	2.2077	5.0
#44 - #82	I rarely need help when using a new computer or software.	2.67	1.3184	4.0
#46 - #86	I consider myself an advanced user of computers and technology.	2.37	1.3870	4.0
#64 - #36	People often come to me for help with a new computer, a new technology, or new software.	3.00	0.9063	3.5
#70 - #28	I use a smartphone regularly for things besides phone calls.	2.03	1.2315	4.0

Note: Aggregate Mean = 2.43

Use of Computers and Technology in the Classroom

The third category that the Likert questions fall into dealt with the use of computers and technology in the classroom. After weighting, the aggregate average of the score was 2.99 with a 0.90 standard deviation.

The following table shows (post negative weighting) participants mean score, standard deviation, and the range of the answers pertaining to participants' Affinity for Computers and Technology. A single participants' score between the paired questions was computed as a mean after reverse weighting the negatively phrased question, and then aggregate mean across all participants was computed. For example, if a participant answers question #15 with a 1 and question #83 with a 6 the score would be computed as an individual mean of 1. Standard deviation was calculated to show whether participants held a general agreement of their answers to a survey question. Range was also calculated between the answers to show differences between the max score found on a question and the minimum score as well. Range was selected due to the possibility of having a low standard deviation but a long range owed to an outlier.

By looking at the data in Table XII, it is clear to see that participants agreed with each other more when answering the paired questions of 85 and 31, seen by a low standard deviation of 0.5876. With a mean score of 2.83, participants Slightly Agree/Agree with question 85.

Question 85: My students can use computers and technology without any instruction.

Also by analyzing the data in Table XII, the largest disagreement (largest standard deviation) between participants answers can be identified as well. In this case, questions 47 & 94 had the largest standard deviation of 1.5796 with a mean score of 3.23.

Question 47: I have utilized a computer or video game within my language learning classes.

Table XII

Use of Computers and Technology in the Classroom Paired Questions Scores

	Use of Computers and Technology in the Classroom			
Paired Questions	**Positive Phrased Statement**	**Mean**	**Standard Deviation**	**Range**
#13 - #59	I enjoy using computers and technology instructionally.	2.53	1.0259	3.0
#15 - #83	I use computer and technology often for instruction.	2.30	1.1464	3.5
#25 - #72	I have taught an online only language course.	5.40	1.2984	5.0
#29 - #75	Computers and technology are readily available for use in the classroom.	2.20	0.9599	3.0
#47 - #94	I have utilized a computer or video game within my language learning classes.	3.23	1.5796	5.0
#49 - #92	As an instructor, I incorporate and use learning management systems like D2L for my class.	2.20	1.1922	4.0
#52 - #34	Except for phone calls, my students are free to use their phones in the classroom.	2.93	0.9232	3.0
#66 - #39	My administration lets me decide what tools to use for teaching.	2.70	1.3202	5.0
#85 - #31	My students can use computers and technology without any instruction.	2.83	0.5876	2.0
#88 - #41	I easily find ways to use computers and technology within the classroom.	3.33	0.7480	3.0
#89 - #45	I incorporate social media into my language learning classes.	3.27	1.2228	3.5

Note: Aggregate Mean = 2.99

With the addition of interview question 5, I am inclined to think that there may just be a large variance in participants' actual use of computers and technology in the classroom. Each of the 4 interviewees mentioned using PowerPoint, D2L, and the projector for their classrooms. This was to be expected at the onset of the research. However, from there, instructors' typical uses of technology in their classroom diverged greatly. Interviewee 1 went on to use the projector, Google Chrome, and a speaker in the classroom as a sort of digital media proctor for the testing within their classroom. Interviewee 1 even went so far to say they avoid PowerPoint

as much as possible because then students feel they can simple skip class and look at the

PowerPoints on D2L. A workaround utilized PowerPoint as an in-class note taking device in

which the students can see the notes taken and then interviewee 1 will turn it into a PowerPoint

that is uploaded to D2L containing only their group notes.

Interviewee 2 pointed out that their use of technology is minimal. They feel that even the

use of PowerPoint requires them to show up as much as 20 minutes early to ensure that there are

no technical difficulties. Interviewee 2 stated that they only use PowerPoints in the classroom to

show upcoming homework dates for the students (which is also available on D2L) in order to

have that as a reminder. From there, interviewee 2 stated their use of D2L is minimal as well

and may contain only dates and instructions for upcoming assignments.

Interviewee 3 also mentioned using PowerPoint at the beginning of the class outlining the

agenda and including a few slides. This was done as they felt too many slides overload the

students and become redundant. However, interviewee 3 expounded on their technology use

pointing out that a video or an audio clip could be played. These could be videos or clips from

the textbook in which the administration requires them to use or complementary clips that

interviewee 3 felt would aid their students in the current objective. Actually watching videos of

other students giving good and bad presentations were a huge benefit of technology in

interviewee 3's mind. This allows the students to actually see and hear differences between them

rather than be told about differences.

Interviewee 4 was teaching at two separate institutions at the time of the interview and

both institutions were on opposite sides of the spectrum. For interviewee 4's university students,

D2L was utilized to communicate in the form of discussions as well as disseminate information

to the students such as syllabi and assignments. However, interviewee 4 went further and had the students utilize their own cell phones. This entailed possibly having some of the students exchange phone numbers, half the class step outside and the other half stay inside and call each other to have conversations via telephone. This could also include having the students record themselves on their smart phones as a means to hear their own (recorded) voice so that the students could hear differences in inflection and intonation. However, interviewee 4 pointed out this use of technology would be impossible in their public school as phones are not allowed. Instead smartboards and provided iPads are utilized. The issue though, is that the smartboards are only utilized as a high tech yes/no selection method in which the student steps forward to select an answer to the question. Interviewee 4 lamented that they cannot change things either with that current administration. They are directed exactly how to use technology. It is not only underutilized, but in both cases of the smart board and the iPads, the students are only working on receptive skills not productive.

When Technology is Detrimental to Language Learning

In the interview, the 4 participants were asked to comment on instances that they felt technology use was detrimental to language learning. Interviewee 1 felt that having to monitor the students to keep them off of social media (such as Facebook) was a major issue. Having to monitor the students' use of technology took time away from other activities and/or better spent time. Interviewee 1 even reported that at times students would have to be reminded to only work on material for the current class. Sometimes students could be found downloading PowerPoints and PDF files for other classes and working on them there.

Interviewee 2 pointed out that the worst times seem to be when the technology itself does not work, in terms of technical issues. Delay of class time, added confusion, and a lack of smooth lessons were also cited as effects by technical issues. On top of the technical issues, interviewee 2 also found that finding the correct item (video, audio, program, etc.) that works with the current lesson plan can be difficult and thereby increase amount of time spent lesson-planning. However, interviewee 2 also pointed out they personally could be an issue. For instance, if interviewee 2 chose a specific document or item that was thought to be great, but upon seeing student reactions they realized it was a bad idea and fit.

Interviewee 3 pointed out that students' possible lack of technological knowledge or ability is a major detriment they have encountered. For example, interviewee 3 mentioned teaching individuals from countries where this sort of technology is not readily available and who have not been present in the United States for an extended period. In this case, teaching them the basics such as using a mouse was needed and took time away that could be better utilized. However, there were some individuals in the class that excelled at the same time and so there would be a huge gap between the students who did not know the basics of the technologies in use and those that did.

When asked the same question, interviewee 4 echoed some of what interviewee 3 outlined. Some of their students are new to the country as well, and are not familiar with iPads and some of the other forms of technology in use. At the current time, interviewee 4 was using a program that was supposed to help in the learner's first language but was extremely limited which caused another slough of problems. Interviewee 4 pointed out that it seems, "they're putting the cart before the horse." The students are expected to learn a language on these iPad

programs but don't have a working knowledge of the technology itself. Then the students are stuck on the program because in order to progress they have to correctly select the answers. Interviewee 4 pointed out it seemed there were times that a student could spend 20-40 minutes simply wrestling with the program and/or lesson and in effect waste that entire time period.

When Technology is Beneficial to Language Learning

Just as participants were asked about times that technology was detrimental to language learning, they were also asked about the times that technology was beneficial. Interviewee 1 felt that the benefits from technology are the students' ability to engage in self-learning. At this point interviewee 1 was teaching a reading and writing class. The ability of the students to easily look up and read definitions for words within the articles is a great benefit in interviewee 1's mind.

When asked the same question, interviewee 2 felt that technology use is beneficial when it's used in conjunction with the lesson at hand. The students are able to listen to some of these audio files and videos, and it gives them an alternate person talking rather than just the instructor. On top of that, often times the use of technology can provide an extra visual, or even in a different medium which will aid in the students grasp and understanding of the lesson.

Through the use of a class blog, interviewee 3 was able to create a sense of community between two sections of a class which met at different times and have not interacted with each other before. A blog post was created and each student was required to respond to one another and take part in a community discussion. In this way, the members of both sections came to know each other as well, despite not having met. The students became invested in each other and the blog itself.

Interviewee 4 felt that anytime a video of some sort, be it YouTube or otherwise, is used within the language being taught is "phenomenal." Interviewee 4 even pointed out the fact this was not readily available 40 years ago is "mind-blowing." These videos in the target language are able to be used to create an authentic experience for students outside of conversation and can effectively create an environment in which the student can learn. Interviewee 4 pointed out that in the case of English here in the United States, students can step outside the classroom and be within a target language environment. However, with other languages it is not the same. Interviewee 4 stated they also teach another foreign language as well and the use of these videos aids in the generation of that environment and authentic experience.

Summary of the Findings

Perceptions of computers and technology. The Perceptions of Computers and Technology category of questions can be associated with participants' enjoyment (or lack thereof). Mean score of this category of questions in Section III of the survey is 2.8 with a standard deviation of 0.42. Keep in mind, a lower score (closer to 1) means Strongly Agree with the positive phrasings of the questions. This category had the lowest standard deviation. In other words, compared to the other two categories there was less variation in participants' answers in this section and generally more agreement. As a whole, it can then be inferred that participants generally have more enjoyment and a more positive perception of computers.

When looking at aggregate scores of this category, the two highest scoring questions (Mean = 3.8) were questions 81 and 90 with a mean score closest to 4 (Slightly Disagree) on the Likert scale.

Question 81: I would enjoy teaching an Online Only Language Course.

Question 90: Computer and video games can be used for other goals such as education in the language learning classroom.

The two lowest scores were question 2 with an aggregate mean of 2.2 and question 21 with an aggregate mean of 2.3. Both scores fall closest to a score of 2 (Agree) on the Likert scale. This indicates the participants (overall) agreed with the following two questions:

Question 2: Computers and technology promote student motivation to learn.

Question 21: Computers and technology are easy to use for instruction.

In the interview sub-group, when asked about participants' philosophy, 3 of the 4 interviewees handled the question as if it were delicate. Their responses were probably best summed up as: technology use has caveats built into it and for effective use it must be integrated properly into the lesson, fit to the learning goals, and only used when necessary. Interviewee 4 expounded on their personal philosophy stating that "technology is not good or bad…it's whether your plan is good or bad."

Each of the interviewees reported times they felt technology was detrimental to language learning. Interviewee 1 felt that having to monitor students to keep them on task and focused on their current class took time away from other more effective uses of time. On top of social media use, students could be found downloading PDF files, PowerPoints, and other files from other classes and working on them rather than focusing on the current class. Whereas, Interviewee 2 felt that technical issues tended to be the greater detriment of learning. Any issues that arise delay class time and can compound confusion. Interviewee 2 also mentioned that matching or finding an item (video, audio, program, etc.) that works with the lesson at hand can be difficult, increase lesson-planning time, or compound confusion as well if it is not as good of

a match as initially thought. Interviewees 3 & 4 both felt that their students' possible lack of

technological knowledge was perhaps the largest detriment to language learning they have

encountered. Both mentioned having taught (or currently teaching) individuals from countries

that are not as technologically advanced and who have not been in our country for a long enough

period of time to learn basic technological skills. Further, Interviewee 4 felt that the public

school's rigidity in requiring the instructors to adhere to their outlined use of technology was a

major detriment especially when the students lacked the knowledge to operate it effectively. The

language learning was effectively side-lined, and instead many of the students would spend time

attempting to learn how to operate these (new to them) technologies.

Interviewees also outlined when technology was thought to be beneficial to language

learning. Interviewee 1 felt that students' ability to engage in self-learning is greatly beneficial.

After all, not everyone learns at the same pace, or faces the exact same obstacles. Interviewee 2

felt that the integration of the technology with the lesson at hand was a great benefit to language

learning. It added a depth to the lessons with an extra visual, or a different medium than the

instructor at hand. Interviewee 3 felt that their ability within blogs to create a sense of

community for the students allowed the students to have a personal investment in their learning

and the lessons at hand. Interviewee 4 felt that the ability to readily use videos allowed

instructors to create an authentic environment conducive to language learning, especially if the

student is not currently residing in the target language.

Affinity towards computers and technology. The scores pertaining to Affinity towards

technology in Section III of the survey had a mean score of 2.43. As you recall, the closer to 1

(Strongly Agree) the individual's score is denotes a positive reported affinity towards computers

and technology. On the gradient scale of agreement, participants' responses to these statements aligned more closely to 2 (Agree) than 3 (Slightly Agree).

When examining the aggregate scores of the questions within this category, the two highest scoring questions are question 43 (aggregate mean = 3.13) and question 64 (aggregate mean = 3.00). These both fall closest to a 3 (Slightly Agree) on the Likert scale.

Question 43: I have taken an online course before

Question 64: People often come to me for help with a new computer, a new technology, or new software.

The two lowest scoring questions (meaning individuals more strongly agreed than disagreed) are questions 24 (aggregate mean = 1.57) and question 10 (aggregate mean = 1.97). These both fall closest to a 2 (Agree) on the Likert scale.

Question 24: I own a smartphone

Question 10: I am comfortable using computers

Individuals in the interview sub-group were asked to self-identify how technologically savvy they felt they were. The question was meant to gauge not only their perceptions of technology but also their individual affinity for it. The four individuals had answers across the spectrum as can be seen below.

Interviewee 1: "not great but not that old to (not) know what it is."

Interviewee 2: "I get frustrated with technology. Once I learn it I learn it but need someone to explain it to me."

Interviewee 3: "very tech savvy. I'm very pro-technology and whenever a new program

of software comes along I learn it easily. I even sleep with cell phone

under my pillow."

Interviewee 4: "I'm not (technologically savvy). As the older I get, the less I get

(understand) I think. I'm generally familiar with things but don't know

many of the features."

Use of computers and technology. When looking at scores in survey section III,

participants had a mean score of 2.99 overall. As you recall, the closer to 1 (Strongly Agree) the

individuals' score is denotes a positive use of computers and technology in the classroom. In

this case, the score of 2.99 is most closely situated to a score of 3 (Slightly Agree). The standard

deviation was higher in this category than the other two categories with a 0.90 standard

deviation. This means that individuals did not agree as strongly in this section with each other's

answers as they did in the other two categories (Perceptions of Computers and Technology &

Affinity for Computers and Technology).

When looking at the aggregate mean scores of the questions within this category, the two

highest scoring questions (the higher score denotes more disagreement) are question 25

(aggregate mean = 5.4) which falls closest to 5 (Disagree) on the Likert scale, and question 88

(aggregate mean = 3.33) which falls closest to 3 (Slightly Agree) on the Likert scale.

Question 25: I have taught an online only language course

Question 88: I easily find ways to use computers and technology within the classroom.

The two lowest scoring questions (the lower score denotes more agreement) are question 29 (aggregate mean = 2.2) and question 49 (aggregate mean 2.2) which falls closest to 2 (Agree) on the Likert scale.

Question 29: Computers and technology are readily available for use in the classroom.

Question 49: As an instructor, I incorporate learning management systems like D2L for my class.

Of the 15 participants in the survey, 10 reported being familiar with the term CALL. Fourteen of the participants were interested in it, and only 10 reported utilizing CALL in their classroom. An assumption that only 10 of the individuals use CALL in their classroom should not be posited. Bear in mind that only 10 of the individuals were familiar with the term. In essence, individuals can use and integrate computers and technology in their classroom without being familiar with the term itself.

When asked about their use of programs, technology, and software in their classroom, the number one answer was PowerPoint with 9 responses. From there, participants listed off various websites they specifically use. When combined, participants had 8 responses to websites used in their classroom. Among the websites are Ted Talks, Blackboard & Learn, Crossword Generator, Kahoot, and Prezi. D2L was also listed with 8 responses as being used in their classrooms despite it only being listed with one response in the section where participants were asked what they use computers and internet for. Table V has the full breakdown of what participants reported for using programs, technology, and software in their classroom. However, it should not be looked at solely. This was an open question and as such participants may not have actually chosen everything they use in the classroom. For example, computer and projector both

only had two responses. However, many of these other types of technology require the computer and/or projector for use.

11 of the 15 participants reported using a computer to learn a language themselves. Of these 11, 9 reported enjoyment while doing so. The top responses on what they enjoyed about using a technology to learn a language were Convenient/ Easily Accessible, Can Hear Pronunciation, Visual Aids, and Work at Own Pace. When faced with the question about what they disliked about it, the number one answer was Technical Difficulties (3 responses). The next two dislikes were preference for face-to-face interaction (2 responses), and that there was no way to know if pronunciation was correct (2 responses).

All 15 participants reported having computer access in their home. Two of the individuals did not have internet access with the remaining 12 reporting they had internet access in their household. When asked what they use the computer and internet for, resoundingly "research" was the number 1 response with 11 of the individuals reporting.   Among the other responses were teaching resources (8 responses), social networking (8 responses), watching videos/movies (7 responses), and typing papers and homework (4 responses). As can be seen, we can split these top 5 responses up into general categories of Entertainment and work (either as a teacher or as a student). A full breakdown of reported activities on computers and internet can be seen in Table IV.

In the interview sub-group, each of the interviewees reported using PowerPoint, D2L, and the projector for their classrooms. From there on, the actual uses in the classroom diverged greatly. Interviewee 1 commented on avoiding PowerPoint as much as possible and instead used technology in the classroom such as the projector, Google Chrome, and the speaker in order to

act as a sort of visual and audio test proctor. Reasoning behind avoiding overuse of PowerPoint

was fear that students would opt to look at the PowerPoints of the class on the D2L system and

may end up forgoing attending class periods. Instead, interviewee 1 used the PowerPoints as a

digital chalk/marker board and took notes in the class period and uploaded those to D2L.

Interviewee 2 remarked that their technology use is minimal. PowerPoints and D2L are only

there to act as a reminder of upcoming deadlines for the students. In this way, their use of D2L

and PowerPoint was utilized to a lesser degree than Interviewee 1. Interviewee 1 and

Interviewee 2 utilized technology in their classroom to a lesser degree than Interviewees 3 & 4.

Interviewee 3 reported using the computer systems in the smart classrooms for video or

audio clips and typically would maintain PowerPoint slides to a minimum. The assigned (by

administration) textbook would also have an online component as well usually entailing some

sort of media to be played. In some cases, this could be an audio or video file tied to the lesson

at hand. Interviewee 3 also mentioned typically searching out some form of media that would

complement the students' current learning objective.

Interviewee 4 taught at two separate institutions. While technology was in use for both

institutions, only the university institution can be classified as having integrated technology in

the classroom. Interviewee 4 used D2L and PowerPoint to the same extent as the other three

interviewees, as a means to disseminate information and remind of upcoming deadlines.

However, interviewee 4 took advantage of the fact that all of their students had cellular phones

and would create exercises in which one half of the class would leave and call the other half to

relay information, thereby working on both productive and receptive skills. Other abilities of the

students' phones were utilized as well, such as voice recording and internet access for research.

Interviewee 4's public school institution, despite their use of technology, would not be classified as technological integration though. Underutilization of smartboards as yes/no selectors and requiring iPad use in lessons (that are not conducive with the lesson at hand) actually cause issues within the classroom according to interviewee 4. The public school institution does not allow the instructors to alter the use of the technology and instead directs its use through mandatory lessons.

In conjunction with the scores of Section III on the survey having a higher standard deviation than the other two categories and the interviewees' responses to their use of technology in their classrooms, there is evidence to suggest that in actuality each of the participants' use of computers and technology in their classroom vary widely.

Chapter V: Discussion

This research study had findings that suggest participants have a general positive response to their perception of computers and technology, their personal affinity for computers and technology, and their use of computers and technology in their classroom. This chapter takes the results found within the research and presents a discussion of them forthwith. Chapter V is broken into four parts: Statement of Problem and Research Questions, Implications, Practical Implications, and Further Research.

Restatement of the Issue and Research Questions

Much of the research that is currently available focuses on the advancements of technology. There are many studies focusing on the different types of technology available, if, and or, when they are effective and how students feel about the use of the technology. However, research is minimal that focuses on teacher/instructor perceptions of the technology, its use, and what they feel is beneficial or detrimental. In fact, most of the research found which mentions teacher/instructor perceptions were often minor additions to another research project or even unsolicited. Chun and Plass (1997) stated that "the primary research question is not whether multimedia instruction is effective but under what conditions and for whom." (p. 69). We as instructors act as not only mediators, evaluators, and porters of knowledge but also as guides in the quest to help students identify relationships among ideas. By focusing more on instructors' perceptions of technology, as well as their insights, we can provide greater benefits to our primary goal, our students. This study focuses on graduate students within a Midwestern university Master of Arts program in Teaching English as a Second Language, and their

perceptions of technology and its integration in their classrooms. The research attempts to

answer the following research questions:

1. What do MA-TESL Graduate students report about their perceptions of computers and

   technology?

2. What do MA-TESL Graduate students report concerning their affinity towards computers

   and technology?

3. What do MA-TESL Graduate students report concerning their use of computers and

   technology?

Implications

There are several implications that these research findings have illuminated. First and

foremost, all participants' ages ranged from 24 to 32 years of age with a mean age of 27.667.

This would hypothetically place them within the generation that Prensky outlined in his 2001

article defining "Digital Natives". Defining them as "Digital Natives" would be further

supported by the use of computers for a mean of 17 years and the use of the internet for a mean

of 15.93 years. However, for students who grew up in this technological age, and in turn became

instructors, their scores in Section III of the survey pertaining to their Perceptions of Technology

(2.8), Affinity for Technology (2.43), and Use of Computers and Technology in the Classroom

(2.99) are not as strong as expected. Especially when you consider the fact that on this scale, 3.5

is the shifting point in scores between agreement and disagreement with statements pertaining to

positive views on each category (with 1 being Strongly Agree and 6 being Strongly Disagree).

Even when the interviewees were asked to describe their own level of technological savviness,

the individuals ranged from not very technologically savvy to extremely technologically savvy.

The pool of participants of this research are the generation that Prensky first referred to in his 2001 paper, but do not match up to his definition of them. In fact, when the interviewees described their typical use of technology in their classroom, it varied greatly among them. In this regard it appears that Apostolos Koutropoulos (2011) article criticizing Prensky's (2001) article as an overgeneralized view of the technological generation gains some traction.

In general, it was expected at the onset of this research that the scores pertaining to individuals' affinity for computers and technology would be lower than their perceptions of it. The mean score for this category was 2.43 with a standard deviation of 0.48 whereas the mean score for Perceptions of Computers and Technology was 2.8 with a standard deviation of 0.42. In actuality, I expected a more positive score (closer to 1) in the Perceptions of Computers and Technology category. To put it simply, I imagined that teachers would see technology as a wonderful addition to a language learning classroom, but their affinity would lag behind their perceptions. Perhaps best illustrated by the statement "I think computers and technology are great but I don't know how to use them or use them effectively in my classroom." On the survey portion though, participants ended up having a higher than expected affinity towards technology. In fact, instead of having an expected more negative outlook on their Affinity for Computers and Technology (in reference to Perception of Computers and Technology), participants had a more positive view on their Affinity for Computers and Technology.

However, perhaps in contrast to those findings, in the interview sub group both Interviewee 2 and Interviewee 4 felt that training was needed for effective technology use in the language learning classroom. Interviewee 4 stated as much directly, whereas Interviewee 2 alluded to it by mentioning without training on technologies they are often frustrated. A call for

more training is an often repeated theme throughout the history of technology's use in the

classroom dating back to early computer aided instruction systems (such as PLATO). Granted,

instructors don't need to learn computer programming (as was the case with many of the systems

utilized on PLATO) but still feel they need training on new computer or program systems in

order to effectively field it for their students. In their research, Olsen (1980), Lai and Kritsonis

(2006), and Tan and McWilliams (2009) found that not only students, but often times instructors,

lack the computer or technology literacy needed to effectively take advantage of programs and

software, which further supports a call for training.

Another interesting implication, perhaps, relates towards Bax's (2011 & 2003) concept of

"normalization." If you recall, Bax originally defined normalization as "the stage when

technology becomes invisible, embedded in everyday practice and hence 'normalized'" (p. 23).

When asked what technologies participants' used in their classroom, Computer and Projector

were only reported twice, whereas, nearly the rest of the software and technology listed in Table

V required one or both for operation. One could argue that since the rest of the participants did

not list either of them, that the presence of a computer and/or projector have become as

embedded in the classroom as a chalkboard or marker board.

When discussing the issues that caused technology to be detrimental to language learning

with Interviewee 4, I found an interesting parallel between Interviewee 4's current situation with

their public school administration and Larry Cuban's *Oversold Underused: Computers in the*

Classroom. The school system made a large purchase of programs and iPads for use in the

language learning classroom yet did not consult with the teachers as to what would be effective.

As stated earlier, Interviewee 4 was wrestling with technology and software that the school

purchased and required instructors to use. However, some of the software was sorely lacking

effective means to meet student learning goals or even (in the case of iPads) failed to take into

account the different technological levels of students. Tan and McWilliam (2009) voiced their

concern about this exact issue, where programs required too much technologically of

disadvantaged migrants even citing "rigidity of school's programming" (p. 222) as major issues.

Interviewee 4 mentioned that many of the students came from less technologically advanced

countries and had been in the United States for a rather short period of time. In this way, not

only is the technology not being used effectively, it is actually acting as a detractor in the

learning process. Bear in mind the Delphi method in which Dillon-Marable and Valentine

(2006) had characteristics outlined for effective technology integration. Some of the

characteristics included the fact that transitions between different mediums (books, computers,

discussion) needed to be "seamless", computer and technology use was appropriate, computer

and technology use is empowering, and computer and technology use is facilitated (p. 108). If

instructors are required to use only a certain medium for a set period of time (in this case iPads

for 45 minutes) then the transition is not seamless. Interviewee 4 stated that often the students

would struggle just to operate the technology. This means that the technology was not

empowering either.

Practical Implications

As with other studies, the interviewees had some interesting insights into the language

learning classrooms and technology. Perhaps the greatest most repeated theme was the need for

training of instructors on technology or programs they are expected to use. This was even

echoed by Interviewee 3 who professed to be a super-user. All four interviewees admitted that

they were extremely hesitant, and even avoided, the use of technology, software, or programs they were not comfortable with or didn't fully understand. D2L is one program in particular which appeared to be at the center of each participant's use and misgivings in its use. The participants were familiar with D2L as a student. However, as instructors they found themselves confused, lost, or struggling with some of the features.

Limitations

Several limitations exist within this study. First and foremost, was the number of participants in the survey itself. Only 15 of the graduate students took part in the survey and without a larger number, statistical significance in the survey data is difficult to show. As such this survey and its results are not statistically valid. A larger number of participants would have made it possible to differentiate when there were statistical outliers such as individuals exhibiting acquiescent bias or extreme response bias. As such, this low number of participants made it impossible to remove any one of them, as with such a low sample size each individual makes up 6.67% of the results. Eliminating any one participants' survey would skew the final results dramatically.

Another limitation of the survey is the length of it. It was made long (94 questions) as a means to try to accurately measure participants' answers with positive and negative phrasings. However, this could have acted as a negative force as well in which the respondents became fatigued throughout the survey and thereby misinterpreted what the questions were asking or even became confused with the Likert scale system with the negatively worded questions.

Further Research

One of the interesting things found in the research came when participants in the interview subgroup were asked to describe how technologically savvy they felt they were. Both Interviewee 1 and 4 referred to their age. There are individuals such as Prensky that hold to the idea that the new "Digital Native" generation in effect has a different type of culture than the older generation. There are also those such as Koutropoulos (2011) who feel that individuals in Prensky's camp have overgeneralized and often failed to take into account factors that would further define these different technological cultures. The fact that we as individuals tend to equate how comfortable we are with technology based on our age is still of interest to note and bears further study.

Secondly, 11 of the 15 participants reported using computers to learn a language. Studying if this prior experience as a student affects their perceptions of computers and technology as an instructor would be of benefit. Especially when you take into account both McKeon's (2014) study that found typically 80% of learners found more enjoyment with online learning whereas only 64% of professors did (p. 66) and Kadel's (2005) finding that teachers' positive attitudes help them to overcome any obstacles that present themselves.

Also analyzing programs in which administrations worked hand-in-hand with instructors to acquire, train, and integrate the technology and its' effectiveness would be of great benefit. Lack of training is an often repeated theme in research, and analyzing the effectiveness of the cooperation between teachers and administrations may increase benefits in the future.

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Appendix I: Survey

<u>Section I</u>

<u>Please fill in the blanks below or mark the appropriate answer</u>

Country of Origin:_____

Gender: _____   Age: _____

Highest Level of Education:_____

Years spent teaching:_____

Years spent using a Computer:_____

Years spent using the Internet:_____

What would you consider your first language?_____

What would you consider your second language? (If any):_____

Do you have Computer access in your home?
                              Y   N

Do you have Internet access in your home?
                              Y   N

What activities do you use a computer or the internet for? Be Specific

_____

_____

Are you familiar with the term CALL (Computer Assisted Language Learning)?
                              Y   N

As a teacher are you interested in CALL (Computer Assisted Language Learning)?
                              Y   N

Do you utilize CALL in your classroom?
                              Y   N

What Programs, technology, or software do you use in your classroom? Be Specific

_____

_____

Section II

The following questions in Section II pertain to your personal use of a computer to learn a language. Please be Specific

1. Have you ever used a computer to learn a language?

       Y   N

  A. If yes which language did you learn?_____

  B. If yes which internet or computer programs did you use? Be Specific

_____

_____

  C. Did you enjoy using a computer to learn the language?

       Y   N

  D. What did you enjoy about using a computer to learn a language? Be Specific

_____

_____

  E. What did you not enjoy about using a computer to learn a language? Be Specific

_____

<u>Section III</u>

The following questions pertain to your opinions of CALL in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

<u>Legend</u> 1= Strongly Agree 2= Agree 3= Slightly Agree 4= Slightly Disagree 5= Disagree 6= Strongly Disagree	<u>Example 1.</u> Reading directions fully is important ① 2 3 4 5 6 In this case you would circle number 1 as your answer that you strongly agree with the example statement.

1. The Use of CALL (Computer Assisted Language Learning) makes learning easier

    1   2   3   4   5   6

2. Computers and technology promotes student motivation to learn

    1   2   3   4   5   6

3. Computers and technology promote student centered learning

    1   2   3   4   5   6

4. Computers and technology present more opportunities for better language practice

    1   2   3   4   5   6

5. Computers and technology promotes student autonomy

    1   2   3   4   5   6

6. Computers and technology increase lesson-planning difficulty for teachers

    1   2   3   4   5   6

7. Computers and technology are difficult to use for instruction

    1   2   3   4   5   6

8. The use of computers and technology does not improve student performance

    1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

<u>Legend</u>
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

  ①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

9. Computers and technology makes lesson-planning time consuming

    1   2   3   4   5   6

10. I am comfortable using computers

    1   2   3   4   5   6

11. I am able to learn and use new software and technology quickly

    1   2   3   4   5   6

12. Using computers for learning takes students away from important instructional time

    1   2   3   4   5   6

13. I enjoy using computers and technology instructionally.

    1   2   3   4   5   6

14. Computers and technology can interfere with student interactions

    1   2   3   4   5   6

15. I use computers and technology often for instruction

    1   2   3   4   5   6

16. Computers and technology increases student reliance on the instructor

    1   2   3   4   5   6

17. I believe that social media should be utilized in the language learning classroom

    1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

      ①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

18. I would not enjoy teaching an Online Only Language Course.

    1   2   3   4   5   6

19. I would enjoy using a computer or video game as a teaching tool for language learning.

    1   2   3   4   5   6

20. Computers and Technology decrease the opportunities for language practice

    1   2   3   4   5   6

21. Computers and technology are easy to use for instruction.

    1   2   3   4   5   6

22. I believe that language learners would not enjoy online learning

    1   2   3   4   5   6

23. Computer and video games are fun

    1   2   3   4   5   6

24. I own a smartphone

    1   2   3   4   5   6

25. I have taught an online only language course

    1   2   3   4   5   6

85

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

① 2 3 4 5 6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

26. I have had adequate training for use of computers and technology in the classroom

1 2 3 4 5 6

27. I prefer online language classes over the traditional face to face classes.

1 2 3 4 5 6

28. I rarely use my smartphone for anything except phone calls.

1 2 3 4 5 6

29. Computers and technology are readily available for use in the classroom

1 2 3 4 5 6

30. Social Media (while focused on entertainment and socializing) can be utilized for other goals such as education in the language learning classroom.

1 2 3 4 5 6

31. I find I have to teach my students how to use computers and technology

1 2 3 4 5 6

32. I use social media all the time

1 2 3 4 5 6

33. Language Learning courses should be restricted to face to face meetings.

1 2 3 4 5 6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

       ①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

34. Except for phone calls, my students are free to use their phones in the classroom

    1   2   3   4   5   6

35. I would enjoy using Social Media for language learning.

    1   2   3   4   5   6

36. I find I must ask for help when using a new computer, a new technology, or a new software.

    1   2   3   4   5   6

37. I believe that the use of social media in a language learning classroom would be beneficial.

    1   2   3   4   5   6

38. I have played computer or video games before

    1   2   3   4   5   6

39. My administration decides what tools I am to use for teaching

    1   2   3   4   5   6

40. Computer and video games have no place in the language learning classroom.

    1   2   3   4   5   6

41. I have a hard time figuring out how to use computers within the classroom.

    1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend	Example 1. Reading directions fully is important
1= Strongly Agree	① 2 3 4 5 6
2= Agree	
3= Slightly Agree	In this case you would circle number 1 as your answer that you
4= Slightly Disagree	strongly agree with the example statement.
5= Disagree	
6= Strongly Disagree	

42. Computer and video games are for entertainment only and have no real educational value in the language learning classroom.

      1   2   3   4   5   6

43. I have taken an online only course before.

      1   2   3   4   5   6

44. I rarely need help when using a new computer or new software.

      1   2   3   4   5   6

45. I have never used social media for my language learning classes.

      1   2   3   4   5   6

46. I consider myself an advanced user of computers and technology.

      1   2   3   4   5   6

47. I have utilized a computer or video game within my language learning classes

      1   2   3   4   5   6

48. Social Media applications and sites are fun.

      1   2   3   4   5   6

49. As an instructor, I incorporate and use learning management systems like D2L for my class.

      1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

     ①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

50. Computers and technology reduces student motivation to learn

    1   2   3   4   5   6

51. I need more training for use of computers and technology in the classroom

    1   2   3   4   5   6

52. My students are not allowed to use their smartphone AT ALL in the classroom

    1   2   3   4   5   6

53. Computers and technology decrease time spent lesson planning.

    1   2   3   4   5   6

54. When new software or technology comes out I have a hard time learning it.

    1   2   3   4   5   6

55. The use of CALL (Computer Assisted Language Learning) makes learning more difficult.

    1   2   3   4   5   6

56. I own a cell phone but it isn't a smartphone.

    1   2   3   4   5   6

57. Computer and video games should be utilized in language learning classroom.

    1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

58. Language Learning courses should have an online element to them.

1   2   3   4   5   6

59. I find it a chore to use computers and technology for instruction.

1   2   3   4   5   6

60. Computers and technology help promote student interactions.

1   2   3   4   5   6

61. I am uncomfortable using computers and technology.

1   2   3   4   5   6

62. I believe social media has no place in the language learning classroom.

1   2   3   4   5   6

63. Computers and technology make lesson planning easier for teachers.

1   2   3   4   5   6

64. People often come to me for help with a new computer, a new technology, or a new software.

1   2   3   4   5   6

65. Computers and technology shift the focus to the instructor in the classroom

1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

    ①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

66. My administration lets me decide what tools to use for teaching

    1   2   3   4   5   6

67. My personal teaching philosophy promotes computer and technology use in instruction.

    1   2   3   4   5   6

68. I rarely use social media

    1   2   3   4   5   6

69. I find computer and video games to be a waste of time.

    1   2   3   4   5   6

70. I use a smartphone regularly for things besides phone calls.

    1   2   3   4   5   6

71. Social Media is only for entertainment and socialization and has no educational value in the language learning classroom.

    1   2   3   4   5   6

72. I have only taught face to face language courses

    1   2   3   4   5   6

73. I would not enjoy using a computer or video game as a teaching tool for language learning.

    1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

①　　2　　3　　4　　5　　6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

74. I prefer the traditional face to face language class versus Online language classes.

1　　　　2　　　　3　　　　4　　　　5　　　　6

75. Computers and technology are not readily available for use in the classroom.

1　　　　2　　　　3　　　　4　　　　5　　　　6

76. I believe that language learners would enjoy online learning

1　　　　2　　　　3　　　　4　　　　5　　　　6

77. Computers and technology use in the classroom is an important use of instructional time

1　　　　2　　　　3　　　　4　　　　5　　　　6

78. I have never played computer or video games

1　　　　2　　　　3　　　　4　　　　5　　　　6

79. The use of computers and technology decreases student performance

1　　　　2　　　　3　　　　4　　　　5　　　　6

80. I have never taken an online only course.

1　　　　2　　　　3　　　　4　　　　5　　　　6

81. I would enjoy teaching an Online Only Language Course.

1　　　　2　　　　3　　　　4　　　　5　　　　6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important

    ①   2   3   4   5   6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

82. I find I must ask for help quite often when using a new computer or new software.

    1   2   3   4   5   6

83. I rarely use computers and technology in the classroom.

    1   2   3   4   5   6

84. I believe that the use of social media in a language learning classroom would be detrimental.

    1   2   3   4   5   6

85. My students can use computers and technology without any instruction.

    1   2   3   4   5   6

86. I consider myself a beginner when using computers and technology.

    1   2   3   4   5   6

87. I would not enjoy using social media for language learning.

    1   2   3   4   5   6

88. I easily find ways to use computers and technology within the classroom

    1   2   3   4   5   6

89. I incorporate social media into my language learning classes.

    1   2   3   4   5   6

The following questions pertain to your opinions of CALL and its use in the classroom. Please answer according to your level of agreement/disagreement of the following statements.

Legend
1= Strongly Agree
2= Agree
3= Slightly Agree
4= Slightly Disagree
5= Disagree
6= Strongly Disagree

Example 1. Reading directions fully is important
① 2 3 4 5 6

In this case you would circle number 1 as your answer that you strongly agree with the example statement.

90. Computer and video games can be used for other goals such as education in the language learning classroom.

1 2 3 4 5 6

91. The use of Computers and technology for instruction does not coincide with my teaching philosophy.

1 2 3 4 5 6

92. I only use learning management systems like D2L to provide course information to students.

1 2 3 4 5 6

93. I find social media applications and sites a waste of time

1 2 3 4 5 6

94. I have never used a computer or a video game within my language learning classes

1 2 3 4 5 6

Appendix II: Interview Questions

1. Can you please describe for me your personal philosophy of technology in the classroom and provide an example of how you put that into use?

2. Can you please describe a specific instance while using Technology in the classroom that you found the use of it to actually be detrimental to Language learning?

3. Can you describe a specific instance while using technology in the classroom that you found technology to be a benefit to language learning?

4. Can you describe how technologically savvy you feel you are and how that drives your use of technology in the classroom?

5. Can you please describe for me your typical use of technology in the classroom?

6. Is there anything further you would like to share concerning technology use in the classroom or this study?