Evolving a technology integration ethos: Technology habits of pre-service and in-service teachers

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ABSTRACT

This study examines current practices and beliefs regarding the self-reported use of technology by pre-service, early-career, mid-career, and late-career teachers. Researchers administered an online survey to elicit information regarding how teachers utilize basic and advanced instructional and personal technologies as well as teachers' proficiency and self-efficacy regarding their technology use.

The findings from this study reveal that early-career teachers utilize technology for communication and social networking significantly more frequently than do mid-career and late-career teachers. The key finding, that mid- and late-career teachers use classroom-related technology more frequently than pre-service and early-career teachers provides important research-based evidence regarding teachers' technology integration in our schools.

Keywords: technology use, teacher education, professional development

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INTRODUCTION

Society has always expected teachers to prepare students with the skills they require to succeed. This task has grown more difficult by the escalating saturation of digital technology in our economies, communications, and personal lives. The increasing importance of technology in business, agriculture, engineering, medicine, transportation, politics, manufacturing, and entertainment has given impetus for the development of novel approaches in education to ensure students learn the technological skills they need to flourish.

A disconnect exists between society's need for a technologically prepared workforce and teachers' ability to successfully integrate the use of technology into their content lessons. While clear evidence exists that teachers have better access to digital technologies (National Center for Education Statistics, 2009), their self-efficacy for technology and the frequency they use those tools are less well-understood. Similarly, the sophistication of teachers' integration of internet-specific technologies is unclear. It is uncertain if educators and their students are transcending traditional Web 1.0 style internet use such as researching using static web-pages and conducting internet searches to more sophisticated Web 2.0 and Web 3.0 web use such as developing web applications, maintaining online presences, and collaborating with web-enabled tools.

While efforts have been made to provide for more robust and authentic technology integration in schools, there are still significant barriers to overcome. These barriers include outdated hardware and software, poor infrastructure for online connectivity, lack of appropriate in-service training and support for teachers, and philosophical differences among educators regarding the necessity of integrating technology use into content areas.

The purpose of this study was to compare pre-service, early-career, mid-career, and late-career teachers' actual technology use. This study explored the kinds of technology tools that teachers use, how teachers spend their time when they use the Internet, as well as teachers' self-efficacy and proficiency regarding the use of digital technologies. This research uncovered interesting and somewhat surprising insights that may help us to form a more complete understanding of teachers' technology use at different stages of their careers.

REVIEW OF THE LITERATURE

Emerging technologies have widened the range of pedagogies that are available to teachers both inside and outside of the classroom. While some technologies, including personal computers, digital cameras, interactive whiteboards, and Internet-enhanced research, have already been thoroughly integrated into most teachers' instruction (National Center for Education Statistics, 2009), new classroom technologies are emerging rapidly. In the near-term, tablet computers and student handheld technologies are currently shaping instructional techniques in classrooms (Johnson, 2013). Over the next decade, educators can expect game-based learning, augmented reality, and personal user interfaces to enter their classrooms (Johnson, Adams & Cummins, 2012). Incipient technologies like these challenge teachers to discover techniques to capitalize on the pedagogies these new technologies make possible.

This challenge affects pre-service, early-career, and veteran teachers alike. New technologies disrupt teachers' instructional habits and routines, forcing them to re-evaluate their methods and to employ new techniques. Not all teachers are equally comfortable or successful with integrating new technologies or modifying their pedagogies. Most theories that describe technology diffusion arrange users along spectrums, from early technology adopters to active

technology resisters (DeSantis, 2013, Hall & Hord, 2010; Venkatesh, Morris, Davis & Davis, 2003). This tendency for uneven use of technology has also been demonstrated to occur among teachers in school environments (Hall, 2010). While it is clear that the rate at which educators adopt technologies has not kept pace with the rate at which new technologies become available, the causes for this discrepancy continue to be debated (DeSantis, 2013).

GENERATIONAL DIFFERENCES?

According to Prensky (2001), Americans raised in the last decades of the twentieth century, a group he termed digital natives, have fundamentally different relationships to technology than earlier generations of Americans, whom he termed digital immigrants. This notion received support from others, who identified significant differences between digital native and digital immigrant generations (Junco & Mastrodicasa, 2007; Palfrey & Gasser, 2010).

For example, Junco (2013) noted that digital natives are avid social media users who spend the majority of their time with technology pursuing their own personal interests; however, they also demonstrate inclinations for adapting their entertainment uses of technology for educational purposes. Berk (2010) further delineated the characteristics of digital natives that set them apart from other generations of learners. These characteristics include the ability to rapidly learn new technologies, penchants for multitasking and collaborating with peers, and a willingness to create using the web.

The reported differences between digital immigrants and natives are not limited to the use of social media and preferences for particular types of classroom instruction. Turkle (2012) noted that evolving communication patterns and tools have de-emphasized the importance of face-to face interaction, crippling some young peoples' abilities to form sustained and meaningful relationships with others.

CHALLENGING THE EXISTANCE OF A DIVIDE

Though most agree that emerging technologies are changing the forms and patterns that shape how we learn and interact with each other, some have rejected the digital immigrant – digital native dichotomy as an oversimplification of a more complicated reality (Bayne & Ross, 2007; Bennett & Maton, 2010). Many of the points made by critics stem from research that indicates that young people in the digital native generation are not as proficient with technologies (other than the use of social media) as would be expected.

One study conducted on the technology use of digital native students in South Africa found wide variations in how its participants utilized technology and noted that only a very small minority of students could be classified as digital natives as they are described in the literature (Brown & Czerniewicz, 2010). Findings from a study conducted by Ransdell, Kent, Gaillard-Kenney, and Long (2011) indicated that digital immigrant generations were more likely than digital natives to utilize digital forms of social support in an online course environment. It seemed as though a more thorough exploration of how teachers of all ages integrate technology during their instruction was warranted.

One difficulty that arises when researching these issues in the use of technology in education is that the idea of a digital divide and the notion of digital natives and digital immigrants is logical. Thus, although some researchers have shown that there may not be a true digital divide based on one's birth year, the general public continues to believe in the concept.

When asked, many people (including educators) will state that older teachers are not really able to use technology in their teaching but younger teachers incorporate technology in their teaching simply because "they grew up with it."

IMPLICATIONS FOR CLASSROOM TECHNOLOGY INTEGRATION

In the last decade, digital natives entered pre-service teaching programs and began careers as teachers. Kennedy, Judd, Churchward, Gray and Krause (2008) found that a majority of incoming freshmen at an Australian university were proficient with using some technologies like personal computers and cell phones. However, their proficiency with more advanced technologies such as maintaining a blog and using webcams for video conferencing was varied, with some students proficient with nearly every possible technology and others only comfortable using computers and cell phones for social interactions. The inability to neatly categorize digital natives into a monolithic group of technology users is a hallmark of the research on this topic and is supported in several studies (Jones, Ramanau, Cross & Healing, 2010; Margaryan, Littlejohn and Vojt, 2011; Toliver, 2011).

These findings have been reproduced among pre-service teachers. Lei (2009) found that pre-service teachers enrolled in an undergraduate program were proficient at utilizing technologies to socialize and for basic tasks, but reported that they were much less comfortable employing more sophisticated Web 2.0 activities such as wikis, blogs, podcasts, and classroom-ready technologies. Lei's findings were reinforced by Kumar and Vigil (2011) who reported that while most of their participants had used message boards and were used to obtaining information from the web, very few had actually created content using emerging social media tools like wikis, blogs, or online videos.

Uneven integration of digital technologies is also prevalent among in-service teachers, many of whom are included in the generation termed "digital natives." In-service teachers are influenced by the site-specific access to technologies in their schools (Buckenmeyer, 2010) as well as their own perceptions of the utility of education technologies in their work with students (Hixon & Buckenmeyer, 2009). While these potential negative effects can be mitigated among in-service teachers with sustained, scaffolded, and collaborative professional development for education technologies (DeSantis, 2012), professional development programs with these qualities are the exception rather than the rule (Hill, 2009).

TOWARD A UNIFIED UNDERSTANDING OF TEACHERS' TECHNOLOGY INTEGRATION

Learning the nature of how teachers use technology at varying points in their career is an essential first step in helping teachers integrate emerging technologies in their instruction. This information could guide the implementation of specific support structures for teachers in our schools such as targeted professional development programs or more effective technical support for hardware.

The findings from the current study inform this debate by exploring the technology habits of pre-service, early career, mid-career, and veteran teachers. An electronic survey, included in the Appendix, was used to elicit specific information regarding how participants use various technologies. More importantly, it allows for a comparison of the technology habits of teachers

of all ages and experience levels, making it possible to determine if teachers at various stages in their careers use technology differently.

RESEARCH QUESTIONS

1. What differences exist in the ways teachers from different career levels spend their time when using technology?
2. What differences exist in the ways teachers from different career levels use the Internet?
3. What differences exist in technology self-efficacy among teachers from different career levels?
4. What differences exist in technology proficiency of teachers from different career levels when using Web 1.0 tools or Web 2.0 tools?

METHODOLOGY AND STUDY PARTICIPANTS

This multi-site quantitative study used a survey originally created by Dr. Jing Lei (2009) of Syracuse University to survey freshmen enrolled in teacher education programs at the university level. The purpose of Lei's study was to examine the "beliefs, attitudes, and technology experiences and expertise, identify the strengths and weaknesses in their technology knowledge and skills, and explore what technology preparation was needed to prepare them to integrate technology into their future classrooms" (Lei, 2009, p. 87).

The current study was designed to build upon Dr. Lei's research by broadening the participant pool to include students who were enrolled in teacher education programs at two institutions of higher education in the northeast who had a wide range of age and teaching experience. The students were currently enrolled in undergraduate, master's, and doctoral degree programs, thus some were practicing teachers and some were pre-service teachers. Researchers were able to compare responses from pre-service, early career, mid-career, and late-career teachers to identify differences in their technology usage, self-efficacy, and proficiency.

Researchers modified the original survey to include contemporary technologies and additional Web 2.0 tools. Additionally, some questions were adjusted because of the change in the study population. The survey was modified, piloted, and then administered online through Qualtrics to 1038 participants enrolled in undergraduate, graduate, and doctoral teacher education degree programs. Invitations to participate were sent to 792 undergraduate students, 61 masters level students, and 185 doctoral students. Responses were received from 207 individuals, for a 20% participation rate.

The online survey (see Appendix) was composed of four sections: demographics and description of use of technology (11 questions), self-efficacy statements related to technology (15 statements using a 5 point Likert scale), rating of proficiency in using various technology tools (52 items using a 5 point Likert scale), and four open-ended questions related to experience and opinions on technology use in classrooms. The questions were designed to elicit a broad spectrum information related to teachers and their interactions with technology.

Researchers defined "digital natives" as those pre-service or in-service teachers who were 32 years of age and under and "digital immigrants" as those who were 33 years of age and up. Respondents were also categorized according to their career stage i.e. pre-service teachers were 18-21 years of age, early career teachers were 22-32 years of age, mid-career teachers were 33-50 years of age, and late career teachers were 51 years of age and up. Thus, the pre-service and

the early-career teacher groups were considered digital natives based on their age and the mid-career and late-career teacher groups were considered digital immigrants.

The study sample was composed of 59% digital immigrants and 41% digital natives, and the mean age of participants was 32.12 years of age. Thus, the two career levels of pre-service teachers and early career teachers are effectively digital natives while the mid-career and late career teachers may be classified as digital immigrants. Pre-service teachers accounted for 23%, early-career teachers 36%, mid-career teachers 29%, and late-career teachers 12% of the study population. Seventy-eight percent of participants were female and 22% were male.

KEY FINDINGS

Overall Use of Technology

Researchers utilized data gathered from items 3, 4, and 5 from the Technology Use Survey (Appendix) to identify differences in how pre-service, early-career, mid-career, and late-career teachers reported their overall technology usage in terms of time spent on specific activities. A mixed between-within subjects analysis of variance was conducted to examine the data related to participants' time spent on personal social media, time spent on productivity software, and time spent searching the web for teaching-related materials for each career level.

There was a substantial main effect for time spent in the three different activities: $F(2, 202) = 91.26$, $p < .001$. There was also a significant interaction between career level and time spent in these activities: $F(6, 404) = 18.39$, $p < .001$. The main effect comparing the time spent on personal social media, productivity software, and searching the web for teaching-related material across the career level categories was significant: $F(3, 6.54) = 3.77$, $p = .01$, suggesting differences in the teachers' use of their time related to their technology use.

Interestingly, of the four groups, pre-service and early career teachers (digital natives) spent the most time each day utilizing social media such as Facebook, while veteran teachers (digital immigrants) used productivity software (word processing and desktop publishing) more. In addition, veteran teachers spent more time searching the web for education materials than did the pre-service and early career teachers, as indicated in Table 1 (Appendix).

Use of the Internet

The researchers next utilized data collected from item 8 of the survey (Appendix 1) to determine if statistically significant differences existed in how teachers from different career levels used the Internet. An expert panel consisting of five doctoral-degree holding education faculty members from accredited institutions of higher education recoded items from survey item eight into three Internet Use categories: Entertainment, Communication, and Productivity. The category of Internet Use for Entertainment included items such as playing games and downloading music. Internet Use for Communication included items such as emailing, blogging, and social networking. Internet Use for Productivity included searching for information related to study, weather, or health, reading news about this country or the world, or getting information about other places, countries, cultures, and peoples in the world. Mean scores for each of the three Internet use categories were calculated for all participants.

In order to determine if there were differences in Internet use among the career levels, the researchers calculated two new variables, the Entertainment/Productivity Gap and the

Communication/Productivity Gap, using the mean scores from the Internet Use Categories. The Entertainment/Productivity Gap variable was calculated by subtracting participants' Internet Use for Productivity mean scores from their Internet Use for Entertainment mean scores. The Communication/Productivity Gap variable was calculated by subtracting participants' Internet Use for Productivity mean scores from their Internet Use for Communication.

A one-way between-groups analysis of variance was conducted to explore the impact of career level on the Entertainment/Productivity Gap. There was a statistically significant difference for the four groups: $F (3, 203) = 10.88$, $p < .001$. The actual difference in mean scores among the groups was large and the effect size, calculated using eta squared, was .14. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Pre-Service Teachers ($M = -.24$, $SD = 1.48$) was significantly different from Early Career Teachers ($M = -1.12$, $SD = 1.33$), Mid-Career Teachers ($M = -1.65$, $SD = 1.46$), and Late Career Teachers ($M = -1.80$, $SD = 1.38$). These results suggest that pre-service teachers use the Internet more for entertainment than early-career, mid-career, and late-career teachers.

Next, a one-way between-groups analysis of variance was conducted to explore the impact of career level on the Communication/Productivity Gap variable that was obtained by subtracting the individual's mean score for productivity from their mean score for communication. There was a statistically significant difference for the four groups: $F (3, 203) = 18.43$, $p < .001$. The actual difference among the groups was large. The effect size, calculated using eta squared, was .21. Post hoc comparisons using the Tukey HSD test indicated that the mean score for Pre-Service Teachers ($M = .12$, $SD = 1.36$) was significantly different from Early Career Teachers ($M = -.78$, $SD = 1.36$), Mid-Career Teachers ($M = -1.48$, $SD = 1.21$), and Late Career Teachers ($M = -1.79$, $SD = 1.06$). Additionally, mean scores for Early Career Teachers were significantly different from Mid-Career Teachers and Late Career Teachers. Finally, mean scores for Mid-Career Teachers did not differ significantly from Late Career Teachers.

These results suggest that pre-service and early-career teachers use the Internet more for communication than mid- and late-career teachers. Additionally, these results suggest that mid- and late-career teachers use the Internet more for productivity than early-career and pre-service teachers.

Technology Self-efficacy

Researchers utilized data collected from all items from section two of the Technology Use Survey (except item number five) to address the question of what differences there may be between teachers' technology self-efficacy between the career levels. The items from section two were combined and mean scores were calculated to determine a Technology Self-Efficacy score for each participant. A one-way ANOVA was conducted to compare the effect of career level on participants' technology self-efficacy among pre-service, early-career, mid-career, and late-career teachers.

There was not a significant effect of Career Level on Technology Self-Efficacy at the $p < .05$ level for the four conditions: $F (3, 198) = 1.11$, $p = .35$. These results suggest that there are no significant differences in technology self-efficacy among teachers of different career levels.

Web 1.0 and Web 2.0 Proficiency

Researchers utilized data collected from section three of the Technology Use Survey to explore whether there was a difference in teachers' proficiency in the use of Web 1.0 tools and Web 2.0 tools. In addition, researchers sought to find out if there was a difference in technology proficiency in the use of Web 1.0 and Web 2.0 tools between teachers from different career levels. The researchers coded items that described participants' proficiency in the basic use of technology and the Internet into a variable called "Web 1.0 Proficiency". Items that reported participants' proficiency in more advanced technology use and Web 2.0 applications were coded into the variable called, "Web 2.0 Proficiency."

The results of a mixed between-within subjects analysis of variance indicated a substantial main effect for proficiency that was statistically significant: $F(1,180) = 167.50$, $p < .001$, indicating that participants were more proficient in Web 1.0 ($M = 3.27$, $SD = 0.62$) than they were in Web 2.0 ($M = 2.87$, $SD = 0.78$). There was no significant interaction between career level and proficiency: $F(3, 180) = .40$, $p = .757$, as all four groups showed a reduction in proficiency between Web 1.0 skills and Web 2.0 skills. The main effect comparing the proficiency of teachers across the career levels was not significant, $F(3, .68) = .737$. $p = .53$, partial eta squared = .01, suggesting no significant differences in the teachers' Web 1.0 Proficiency or Web 2.0 Proficiency among the career level categories.

These results imply that study participants were more proficient using basic technology and less proficient using more advanced technology. The participants did not show significant differences in their proficiency for using basic or advanced technology based on upon their career level, as indicated in Table 2 (Appendix).

DISCUSSION AND CONCLUSIONS

Are there differences in the ways that younger teachers use technology and the ways that older teachers use technology? Do younger teachers report that they use technology more often and in more advanced ways than older teachers? Are younger generations "just better" at technology because they have grown up in the digital world? These questions stimulate discussions among educators who want to improve the technology capabilities of teachers so that they may better prepare students for their participation in an increasingly digital world. The findings from the current study contribute to these ongoing discussions. The researchers examined responses detailing the participants' technology usage, self-efficacy for technology use, and proficiency of technology use in relation to their career level. It is hoped that these findings will challenge the notion that "generational differences" are at the heart of the lag in teachers' integration of new technologies.

Teachers' Use of Technology

Researchers' analysis of the data collected in this study began with an attempt to create a picture of how teachers used technology. Pre-service teachers devoted much more time to using social media than early career teachers even though both groups are digital natives. The mid-career teachers and late career teachers also spent less time on social media than pre-service teachers. These findings are perhaps not surprising in light of the usually reduced life stage

responsibilities of the pre-service teachers and the availability of time to devote to personal social media that may not have direct career benefits.

The researchers also found that digital immigrant teachers used technology more for classroom-related activities than digital native teachers. For example, the data suggested that the older the respondent (by career level), the more times a week they used productivity software such as word processing and desktop publishing. The frequency teachers reported searching the web for ideas and materials to improve their instruction also increased with the age of the respondent. This is important because it may demonstrate the likelihood that teachers will develop their proficiency in the appropriate use of technology to enhance students' learning throughout their careers. Together, these findings indicate that digital immigrant teachers are using the kinds of technology tools that are most likely to contribute to their classroom teaching. While this seems to be a reasonable finding if one considers that it becomes increasingly important to use the computer as a tool to assist with work related responsibilities as those responsibilities multiply, it does run counter to the predictions implied by Prensky (2006) and his supporters.

Next, researchers examined responses detailing how teachers used their time when they were actively using the Internet. There were significant differences in the way each group used their Internet time, with pre-service teachers using the Internet mostly for entertainment while late career teachers reported using the Internet primarily for productivity. In addition, findings indicated that the digital natives used the Internet for entertainment significantly more than did the digital immigrants. A similar pattern was found when analyzing the use of the Internet for communication vs. productivity. The younger the teacher, the more they used the Internet for communication instead of productivity. As teacher ages increased, their use of the Internet for communication diminished with a corresponding increase in the use of the Internet for productivity.

Technology Self-Efficacy and Proficiency

Technology self-efficacy has been noted by researchers as an important factor in contributing to teachers' use of technology in the classroom (Brinkerhoff, 2006; Holden & Rada, 2011; Overbaugh & Lu, 2008). One might assume that since the pre-service teachers and early career teachers were digital natives that they would report higher levels of technology self-efficacy than the mid-career and late career teachers. However, the results of the current study indicated no significant differences among the teachers in different career levels relative to their reported technology self-efficacy. Digital immigrant participants in this study were as confident in their technology abilities as digital natives.

So, how good are teachers at using technology and what kinds of technology do they believe that they are more proficient at using? The results of the study show that teachers report that they are much more proficient in using Web 1.0 tools than Web 2.0 tools, and this finding was consistent across the career stages. Web 1.0 tools are those that are more basic and taught in schools such as word processing, viewing web pages and using drill and practice programs or tutorials. Web 2.0 tools are more advanced and involve the integration of skills learned in using Web 1.0 skills (such as word processing) to develop web pages or using web-based productivity tools to collaborate with peers (Peek, 2005). Interestingly, since there were no significant differences among the groups in their reported proficiency in using Web 1.0 or Web 2.0 tools,

this would seem to indicate that again, the digital immigrants are keeping up with the digital natives in their proficiency in using technology.

This study revealed a surprisingly nuanced relationship among teachers' career levels, technology use, technology self-efficacy, and technology proficiency. While pre-service and early career teachers reported higher levels of technology use for communication and technology, mid- and late career teachers reported higher levels of technology use for productivity and classroom related technologies. These results run contrary to the predictions by proponents of the existence of a digital divide that separates teachers born before and teachers born after the digital revolution. While informative in their own right, these results invite further research into the nature of generational differences in teachers' technology use. Most notably, the current study could be expanded by including in-service teachers not enrolled in graduate coursework or by administering a longitudinal study to identify changes in teachers' technology proclivities over time.

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APPENDIX

Table 1
Time Spent Using Technology

	Time Spent of Personal Social Media			Time Spent on Productivity Software			Time Spent Searching the Web for Teaching-related Materials		
	n	M	SD	n	M	SD	n	M	SD
Pre-service	49	3.51	1.18	49	3.49	1.00	49	2.69	1.28
Early-Career	74	2.88	1.37	74	4.12	1.05	74	3.85	1.19
Mid-Career	60	2.03	1.04	60	4.68	0.75	60	4.02	1.02
Late-Career	24	2.42	1.53	24	4.75	.676	24	4.17	1.05
All Teachers	207	2.73	1.37	49	2.69	1.28	207	3.66	1.27

Table 2
Web 1.0 and 2.0 Proficiency Scores

	Technology Web 1.0 Proficiency			Technology Web 2.0 Proficiency		
	n	M	SD	n	M	SD
Pre-service Teachers	44	3.13	0.56	44	2.78	0.72
Early-Career Teachers	68	3.35	0.61	68	2.92	0.79
Mid-Career Teachers	52	3.31	0.66	52	2.90	0.76
Late-Career Teachers	20	3.12	0.67	20	2.80	0.93
All Teachers	184	3.27	0.62	184	2.87	0.78

TECHNOLOGY USE SURVEY

Section 1: Please check your responses to the following questions or fill in the blanks where appropriate.

1. Your gender:
   - Female
   - Male

2. When did you start using a computer?
   - Before kindergarten
   - In kindergarten-grade 3
   - In grade 4-5
   - In grade 6-8
   - In grade 9–12
   - After grade 12

3. How much time do you spend on computers everyday?
   - Not at all
   - Less than one hour
   - About 1-2 hours
   - About 2-3 hours
   - About 3-4 hours
   - More than 4 hours

4. Which of the following devices do you own? (choose all that apply)
   1. Desktop Computer
   2. Laptop
   3. Cell Phone
   4. Smart Phone (iPhone or Android)
   5. Game Console
   6. Mp3 player
   7. PDA (Personal Digital Assistant)
   8. iPad or similar product
   9. E-reader (such as Kindle or Nook)

6. What do you use computers for?(choose all that apply)

- For learning-related activities
- For entertainment (playing games, watching videos, etc.)
- For social/communication activities (chat, e-mail, IM, etc.)
- For practical purposes (find info. you need)
- For self-expression (blogging, commenting, etc.)
- For constructive activities (creating Web pages, uploading video/ audio/music, files, etc.)
- Shopping
- Other (please specify) _____

7. What do you use the Internet for (choose all that apply)?

- Searching information for my study (e.g., preview, review, homework)
- Searching information for other practical purposes (e.g., weather, health, etc.)
- Reading news to know what's going on in this country
- Reading news to know what's going on in the world
- Sending and receiving e-mails
- Playing games
- Online chatting (chat rooms, Instant Messenger, etc.)
- Surfing online for fun (reading novels, stories, entertainment)
- Downloading music, pictures, movies, etc.
- Blogging
- Publishing my digital media files online (e.g., on Youtube, podcasting, etc.)
- Social networking (e.g., Facebook, Myspace, etc.)
- Viewing and posting messages (e.g., on forums, discussion boards, etc.)
- Getting information about other places, countries, cultures, and peoples in the world
- Shopping (e.g., Amazon, eBay, other online stores, etc.)
- Other (please specify) _____

8. Overall, on which task do you spend most time while using the Internet?(only choose one)

- Searching information for my study (e.g., preview, review, homework)
- Searching information for other practical purposes (e.g., weather, health, etc.)
- Reading news to know what's going on in this country
- Reading news to know what's going on in the world
- Sending and receiving e-mails
- Playing games
- Online chatting (chat rooms, Instant Messenger, etc.)
- Surfing online for fun (reading novels, stories, entertainment)
- Downloading music, pictures, movies, etc.
- Blogging
- Publishing my digital media files online (e.g., on Youtube, podcasting, etc.)
- Social networking (e.g., Facebook, MySpace, etc.)
- Viewing and posting messages (e.g., on forums, discussion boards, etc.)
- Getting information about other places, countries, cultures, and peoples in the world
- Shopping (e.g., Amazon, eBay, other online stores, etc.)
- Other (please specify) _____

9. To you, what's the most exciting about the Internet?

- Getting information I need for my study
- Getting information I need for other practical purposes
- Reading news
- Playing games
- Making new friends
- Communicating with my friends
- Chatting with strangers
- Knowing things about the world
- Shopping
- Downloading files I need
- Expressing my ideas freely
- Other (please specify) _____

10. How many formal courses have you completed regarding educational technology?

- 0
- 1
- 2
- 3

11. What is your birth year? (Choose one)

- Before 1950 (Digital Immigrant)
- 1951-1969 (Digital Immigrant)
- 1970-1974 (Digital Immigrant)
- 1975-1979 (Digital Immigrant)
- 1980-1984 (Digital Native)
- 1985-1989 (Digital Native)
- 1990-1996 (Digital Native)

Section 2: Please indicate, on a scale of 1 to 5, your responses to each of these statements. (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree)

- Computers are generally reliable.
- The more technology you use, the more respect you will get from your peers.
- I feel comfortable using technology.
- I do well with computer technologies.
- Computers and related technologies will isolate students from one another.
- I am interested in computers and related technologies.
- I am interested in learning new technologies.
- I am interested in learning technologies that will help my teaching in the future.
- I believe that technologies can help me teach better.
- I believe that technologies can help my students learn better.
- I can solve most of the problems when my computer doesn't work.
- I am confident in using technology in my learning.
- I am confident in using technology to teach.
- I have been taught to use technology in my classroom.
- My teachers frequently used technology in content areas, so I have had good models.

Section 3: How would you rate your proficiency of the following skills? Please check your response on a scale of 1 to 5.

1 = No experience
2 = Beginner (little skill)
3 = Moderate (can use some already-prepared applications, or can perform the task with help)
4 = Substantial (can use and create/customize many applications on my own)

5 = Expert (could teach others how to use and create/customize many applications)

- Navigating the Web
- Finding information from Web searches
- Evaluating information from Web searches
- Searching electronic library databases for books, articles, and other resources
- Using e-mail
- Using Web-based course management software (BlackBoard, WebCT, D2L)
- Using instant messenger software
- Developing a wiki
- Blogging
- Maintaining a personal social-networking site (e.g., Facebook, Myspace, etc.)
- Downloading pictures/movie/music
- Setting up a video conference
- Word processing
- Using electronic spreadsheets (e.g., MS Excel)
- Using electronic databases (e.g., MS Access or FileMaker)
- Desktop publishing (e.g., writing newsletters)
- Using presentation software (e.g., PowerPoint or Prezi)
- Scanning documents
- Editing documents
- Using digital cameras
- Using audio devices to record sounds
- Using digital video cameras
- Editing pictures
- Editing audio files
- Editing video files
- Publishing pictures (e.g., on Flickr.com)
- Publishing audio files
- Publishing video files (e.g., on Youtube.com)
- Using a cloud storage site
- Using music edit applications
- Developing Web pages
- Using graphic design applications
- Creating animation
- Programming
- Playing computer games
- Using hand-held and other mathematical calculators
- Using hand-held and other scientific digital probes
- Using personal digital assistants (PDAs)
- Using a SMART board
- Using idea processors (e.g., Inspiration, concept mapping)
- Using drill and practice programs/tutorials
- Using other software specific to content in areas you plan to teach or have taught
- Using augmentative systems to help persons with disabilities communicate

- Using assistive technology to help persons with disabilities learn
- Setting up computers (e.g., connecting power cable, data cable, etc.)
- Installing software
- Managing, storing, and backing up files on servers, CDs, cloud, etc.
- Using Apple operating systems
- Using PC-based operating systems
- Troubleshooting hardware problems
- Troubleshooting software problems
- Exploring new technology

Section 4: Please respond to the following questions about your experiences and opinions on technology use in classrooms.

1. Based on your own experience, what are the good things about integrating technology into classrooms? What are the problems?
2. How should technology be used in PK–12 classrooms?
3. Should technology be infused into all content areas?