

The Perceived Literacy Skills of “Digital Natives” and “Digital Immigrants”

in one Teacher Preparation Program

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### Abstract

This study investigated the perceived literacy skills of “digital natives” (those born during or after the rise of digital technology) and “digital immigrants” (those born before the advent of digital technology). The intent was to determine the familiarity with, perceived skills, and frequency of use related to web interactive, technical oriented, social interactive, game oriented, and work oriented technologies of “natives” and “immigrants.” One hundred eleven teacher candidates and teacher education faculty were surveyed to determine their perceptions about levels of use and skills regarding five categories of technology. A two-sample *t*-test assuming unequal variances revealed a significant difference in perceived skills between the natives and immigrants. However, there was no significance difference between natives’ and immigrants’ self-reported levels of use of technology. These results seem to contradict the common perception that immigrants struggle more than natives to adapt to the rise of digital technology.

*Key words:* digital natives, digital immigrants, digital literacy, web interactive, technical oriented, social interactive, game oriented, work oriented, technology

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Despite the availability and seemingly constant interaction with technology of those born in the last two decades, there appears to be a gap between the perceived competencies of the "digital natives" (those born during or after the rise of digital technology) and the "digital immigrants" (those born before the advent of digital technology) (Prensky, 2001). The familiarity with and exposure to web interactive, technical-oriented, social interactive, game-oriented, and work-oriented tools does not equate to "digital competency" (Hosein, Ramanau, & Jones, 2010; Jones & Shao, 2011). The findings of these experts have implications for teacher educators, higher education, classroom teachers, literacy specialists and school leaders as we navigate the 21<sup>st</sup> Century and beyond.

As with traditional literacy, both teachers and their students need guidance to make the best use of technology for teaching and learning. Teacher educators have the responsibility to cultivate curiosity and develop skills necessary to identify, access, evaluate, and integrate technology into the curriculum they teach. Curriculum specifically designed around technology and interactive media learning tools is critical to improving teaching and learning (National Association for the Education of Young Children, 2012; National Education Technology Plan, U.S Department of Education Office of Education Technology, 2010). The development of digital literacy leads to the ability to analyze, synthesize, and evaluate multiple streams of simultaneous information in order to be active, successful participants in the 21st Century global society (International Reading Association, 2009; National Council of Teachers of English, 2013).

The purpose of the present study was to investigate the perceived digital literacy of “digital natives” and “digital immigrants” as defined by Prensky (2001) in one teacher preparation program. The intent was to determine the familiarity with, perceived skills, and frequency of use related to web interactive, technical oriented, social interactive, game oriented, and work oriented technologies of both groups. The researchers designed a survey to address the following research question:

*Is there a real difference between the knowledge and frequency of use of technology by digital natives and digital immigrants in this teacher preparation program?*

### **Method**

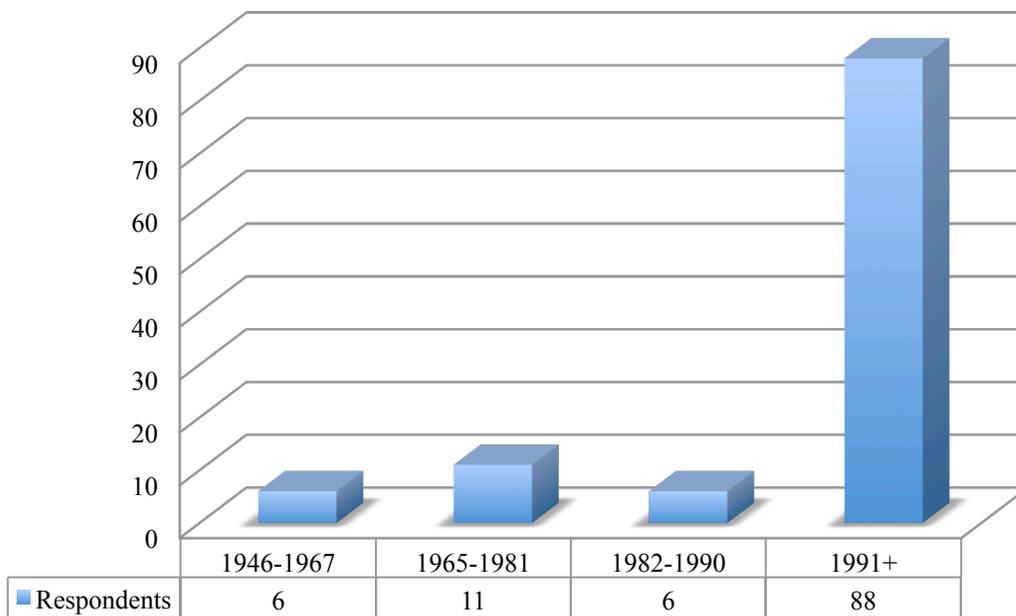
This study was designed and conducted using a researcher-created questionnaire with statements aimed at measuring the perceived digital literacy skills and frequency of use related to specific technology tools. Participants were sent an initial email with a link to a survey and then a reminder email to encourage more to complete the questionnaire.

### **Instrument**

The research team created a survey with questions related to level of skill and frequency of use in each of the following categories: (1) web 2.0 tools (web interactive), (2) audio and video editing tools (technical-oriented), (3) online resources or word processing/presentation software tools (work-oriented), (4) social networking tools (social interactive), and (5) gaming consoles (game-oriented). The survey was administered through a web-based, interactive questionnaire format. There were 25 questions designed to illicit respondents’ knowledge of and ability to use technology, and then 27 questions designed to determine respondents’ frequency of use of specific technology tools. Respondents used a Likert rating scale of 1 to 4 with 1 being the least and 4 being the most, to identify levels of skills and use.

## Participants

All pre-service elementary education teacher candidates and faculty (302 candidates and 18 faculty) in one teacher preparation program were invited to answer the digital literacy questionnaire. There were 111 total respondents to the survey (35% of the total pool) regarding the perceived skills and familiarity with digital literacy tools. These respondents included 99 pre-service elementary education teacher candidates (89.2%) and 12 university faculty members (10.8%). The respondents further identified their status as either a digital native (84.7%) or a digital immigrant (15.3%) by recording their birth date. Further age breakdown can be seen in Figure 1.



*Figure 1.* The number of survey participants by age.

## Data Analysis

Data were analyzed quantitatively based on recommendations by Marshall and Rossman (2010) who argue that when a survey is used as the primary means of data collection, the beliefs and perceptions of individuals may be precisely collected and quantified through self-reporting.

The research team for the present study analyzed the data reporting the level of skill and frequency of use for the native and the immigrant groups using two sample *t*-tests assuming unequal variances. The first test was conducted for skills and the second test was conducted for frequency of use. Additional two sample *t*-tests assuming unequal variances were run on the data from each of the same two groups for each category of technology (web 2.0 interactive, technical-oriented, work-oriented, social media, and game-oriented) to see if there was a difference in a particular category of tools.

### Findings

A two-sample *t*-test assuming unequal variances revealed a significant difference in perceived skills between the natives and immigrants (see Table 1). The immigrants scored significantly higher on perceived levels of digital literacy skills than the natives.

Table 1

#### *Results Comparing Digital Natives and Immigrants' Digital Literacy Skills*

Group	n	Mean	SD	<i>t</i> -stat	<i>t</i> -critical	df	p
Natives	17	2.35	0.63	2.857835614	1.984467455	98	0.005210055
Immigrants	94	2.80	0.71				

A two-sample *t*-test assuming unequal variances was conducted on the means of each category of technology tool to determine if there was a real difference between the overall frequency of use reported by digital immigrants and digital natives. The digital immigrants scored slightly higher in each category of digital technology, as well as on the aggregated means used for this test. However, the *t*-test revealed no significant difference (see Table 2).

Table 2

*Results Comparing Frequency of Use of All Tools between Digital Natives and Immigrants*

Group	N	Mean	SD	<i>t</i> -stat	<i>t</i> -critical	df	p
Natives	5	3.16	0.113	0.67513	2.30600	8	0.518619979
Immigrants	5	3.02	0.102				

Means were compared across both groups for each category of digital literacy. There was no significance difference between natives' and immigrants' self-reported frequency of technology use in any category (see Table 3).

Table 3

*Results Comparing Frequency of Use of Types of Tools for Digital Natives and Immigrants*

Technology Category	Group	n	Mean	SD	<i>t</i> -stat	<i>t</i> -critical	df	p
Web 2.0	Natives	17	3.36	1.33	0.370101262	2.109815578	17	0.71587762
	Immigrants	94	3.53	0.74				
Tech Oriented	Natives	17	3.06	0.21	1.734038246	2.160368656	13	0.106544462
	Immigrants	94	3.40	0.11				
Social Oriented	Natives	17	2.79	0.69	0.216109	2.024394	38	0.830059
	Immigrants	94	2.85	0.80				
Game Oriented	Natives	17	2.64	0.33	0.648154679	2.10092204	18	0.525067521
	Immigrants	94	2.81	0.35				
Work Oriented	Natives	17	3.23	0.73	0.146217727	2.144786688	14	0.885834042
	Immigrants	94	3.29	0.71				

Descriptive statistics revealed more frequent use of search engines, electronic libraries, Moodle, and email by immigrants than natives; more knowledge and use of all technical oriented tools by immigrants, especially digital storytelling; almost identical use of work-oriented tools between groups; nearly identical use of social media tools, with immigrants scoring slightly higher on Skype use, natives scoring slightly higher on WhatsApp use, and natives born after 1991 scoring notably higher on GroupMe use. There were mixed results on the reported use of game oriented technology tools. Natives reported using gaming systems slightly more than immigrants, but slightly less than immigrants on use of BrainPop.

### **Discussion and Implications**

The results of the current study suggest that digital immigrants may be more knowledgeable and skilled at web interactive, technical-oriented, work-oriented, social interactive, and game-oriented digital tools than their native counterparts. The results of this study seem to contradict the common perception that digital natives are more adept at digital technology use than digital immigrants. These findings imply that familiarity with and use of technology is not related to age. The results of the present study seem to support those of Hosein, Ramanau, and Jones (2010), as well as those of Jones and Shao (2011) who concluded that exposure to web interactive, technical-oriented, social interactive, game-oriented, and work-oriented tools does not necessarily mean more knowledge and skills with those tools. These findings may also support the opinion of Prensky (2001) who said that it could not be assumed those who have spent their entire lives surrounded by and using technology necessarily are more adept than those not born into technology.

**Limitations**

Factors that may have impacted the results of this study are the instrument and considerations related to the participants. The questionnaire used for this study was researcher-developed and although it followed a standard format, an established Likert rating scale, and was compared to similar instruments in the field, it was not tested for either reliability or validity. Another factor that may have affected results is the small number of digital immigrants who responded to the study. Additionally, the majority of participants who were identified as digital immigrants were university faculty whose task it is to model and teach relevant technology use to pre-service educators. It should be taken into consideration that these factors may have influenced the results.

**Recommendations**

Based on the results of the present study, recommendations are made regarding instruction and future research. It appears that college faculty and classroom teachers must abandon the assumption that students have the requisite knowledge and skills of technology and its applications to be completely digitally literate. More time should be taken to pre-screen and assess skills, and then provide support for completing assignments that require technology. For future research it is recommended that the instrument be tested for reliability and validity. It is further recommended that variables other than birthdate be considered in disaggregating responses to the questionnaire. Variables such as socio-economic status, first language spoken, and general access to technology should also be considered. Finally, it would be interesting to test the level of skills and perceived levels of skills of the participants by having them actually perform tasks related to each of the categories.

### Summary

Based on recommendations of experts like Jones and Shao (2011) and Prensky (2001), and organizations such as the International Reading Association as far back as 2009, this study examined the familiarity with, perceived skills, and frequency of use related to web and social interactive, as well as technical, game and work oriented technologies of the digital natives and immigrants in one teacher education program. The intent was to address the research question, *“Is there a real difference between the knowledge and frequency of use of technology by digital natives and digital immigrants in this teacher preparation program?”* The results suggest that digital immigrants may be more knowledgeable and skilled at some digital tools than their native counterparts. This seems to contradict the popular notion that digital natives are more adept at technology than digital immigrants. Therefore, it is recommended that college faculty who prepare classroom teachers take steps to determine the digital knowledge and skill of teacher candidates, then model and require use of these skills in their courses and assignments. Future research might use a questionnaire that has been tested for reliability and validity to determine the differences of knowledge and use among groups using factors other than age. This study reinforces the idea that it is incumbent upon teacher educators, higher education, classroom teachers, literacy specialists and school leaders to make the best use of technology for teaching and learning as we navigate the 21<sup>st</sup> Century and beyond.

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