2-2011

“Digital Nerds” and “Digital Normals”: Not “Digital Natives” and “Digital Immigrants”

Mandayam Thirunarayanan

Herminia Lezcano

Myra McKee

Gus Roque

Februqry 2011 Home Page

Editor's Note: This paper reviews "ad hoc" definitions of technology users in search of more exact terminology. This excellent paper is intriguing, thoughtful and amusing.

"Digital Nerds" and "Digital Normals": Not "Digital Natives" and "Digital Immigrants"

M.O. Thirunarayanan, Herminia Lezcano, Myra McKee, Gus Roque

USA

Abstract

The designations "digital immigrants" and "digital natives" have become quite popular among educators in the United States and perhaps other countries. However, the two designations are not based on research. A survey of 359 college students who were born in the digital age showed that participants exhibited both "native" as well as "immigrant" behaviors. The authors discuss the findings of the study and propose the two alternative designations "digital nerds" and "digital normals."

Introduction and Purpose of the Study

The designations of "digital natives" and "digital immigrants" that were originally proposed by Prensky (2001a) have been widely accepted as being true, with practically no data to support the designations or much research being conducted to test the validity of the two designations. In fact in the first paper in which Prensky (2001a) proposes the designations of "digital natives" and "digital immigrants," he cites no research to support his ideas.

The primary purpose of this study is to explore whether or not designations of digital natives and digital immigrants are valid ways of categorizing those who were born in the digital era.

Study Methods, Findings, and Discussion of the Findings

Sample of Subjects

Participants of this study were drawn from two freshmen year classes in taught in a large, public, urban university that has been nationally classified as a research university. An application package was prepared and submitted to the Institutional Review Board (IRB) at the university and the application was approved. After such IRB approval was obtained, the instructor for the two classes was approached and his permission obtained to administer the survey in two sections of a course that he taught in the same classroom but on different days, during the semester of Fall 2010. Two days, one for each section of the course, were scheduled for data collection, and on these designated dates, the researchers visited both the classes about twenty minutes before the end of each class period.

The survey, with a copy of the consent statement attached, was distributed to all students in the classroom. A copy of the consent statement was also projected on the large screen that was available in the classroom. Students were requested to read the consent statement and to ask questions before they started completing the surveys, A few students did not participate in the survey because they were not yet 18 years old and were therefore considered to be minors. When the application was submitted to the IRB to conduct the study, the researchers specified that data will be collected only from students who were 18 years of age or older.

Analyses of Data and Discussion of Findings

Sample of Participants

The sample of participants was drawn from a university that offers more than 200 degree programs at the undergraduate, graduate and doctoral levels in numerous disciplines. The number of students currently enrolled in the university exceeds 44,000, and is expected to grow in the future. At the time this paper was written, sixty percent of the enrolled students were of Hispanic origin. Other ethnic groups represented at this very diverse university included non-Hispanic Whites (14%), Blacks (13%), Asian or Pacific Islanders (4%). Minority students belonging to other groups accounted for nine percent of the student population.

Data show that a total of 359 students participated in the study. Of these 359 participants, 122 or 49 valid percent were males and 127 or 59 valid percent were females. Data regarding sex was missing for about 10 or 3.9 percent of students.

Survey Results that Support the Designation of 'Digital Natives'

Some aspects of the two designations may be true, but some of the assumptions made by Prensky (2001a; 2001b) are definitely not valid. First, let us look at some of the assertions made by Prensky (2001a; 2001b) that are supported by the data collected for this study. When asked the question, "Given the choice, would you take an exam online or on campus?", 103 or 39.8 percent of the study participants selected the choice "online" as opposed to 62 or 23.9 percent who chose "face to face (paper)" as their preferred way of taking an exam. Table 1 shows the percentages of respondents who chose other options.

Table 1

Students' preferences for taking exams

	Frequency	Percent	Valid percent	Cumulative percent
Online	103	39.8	40.1	40.1
Face to face (Paper)	62	23.9	24.1	64.2
Face to face (Computer)	1	.4	.4	64.4
Both (online or face to face)	44	17.0	17.1	87.1
Depends on the type of exam	47	18.1	18.3	100.0
Missing	2	99.2	100.0	
Total	259	100.0		

A very large number and percentage of participants (226 - 87.3%) also reported that they multitask, or engage in various tasks at the same time. However, as the data in Table 2 shows, the different tasks in which large percentages of the participants engaged seem to be routine tasks, such as browsing the Internet and sending and receiving text messages, that do not require serious focus and concentration to accomplish. Psychologists think that multitasking often only results in people performing more poorly on different tasks that they attempt to do at the same time than if they do each task separately (Willingham, 2010).

Table 2

Things students do while they watch TV.

	No	Yes	Total
Browse internet	17.0%	83.0%	100.0%
Talk on the phone	42.9%	57.1%	100.0%
Study for school	44.0%	56.0%	100.0%
Play video games	83.4%	16.6%	100.0%
Send and receive text messages	10.8%	89.2%	100.0%
Chat online with friends	40.5%	59.5%	100.0%

More than ninety-one percent of college students of the digital age also own tools of the digital age, as shown in Table 3. Two hundred and twelve participants (82.2%) also reported that they use Google every day to search for information. This is shown in Table 4. As shown in Table 5, an overwhelmingly large percentage (95.7%) of the respondents reported that they read documents on the computer compared to less that five percent who print the documents and read them. The data in Table 6 shows that more than seventy five percent of the respondents also check their email messages and the updates on social networking sites at least once a day. More than forty-five percent check their messages at least two or three times a day. These are all certainly behaviors that can be expected of "digital natives."

Table 3

Do students own laptops?

	Frequency	Percent	Valid percent	Cumulative percent
No	23	8.9	8.9	8.9
Yes	236	91.1	91.1	100.0
Total	259	100.0	100.0	

Table 4

Using Google to search for information.

	Frequency	Percent	Valid percent	Cumulative percent
Every day	212	81.9	82.2	82.2
Two or three times a week	42	16.2	16.3	98.4
A few times a month	4	1.5	1.6	100.0
Total	258	99.6	100.0	
Missing 9	1	.4		
Total	259	100.0		

Table 5

Reading documents on the computer.

	Frequency	Percent	Valid percent	Cumulative percent
Read it on your computer	247	95.4	95.7	95.7
Print it to read it	11	4.2	4.3	100.0
Total	258	99.6	100.0	
Missing 8	1	.4		
Total	259	100.0		

Table 6

How often do students check email messages and updates on social networks

	Frequency	Percent	Valid percent	Cumulative percent
Two or three times a day	118	45.6	45.7	45.7
	78	30.1	30.2	76.0

	Once a day				
	Once a week	14	5.4	5.4	81.4
	Any time I get a notification	46	17.8	17.8	99.2
	Rarely	2	.8	.8	100.0
	Total	258	99.6	100.0	
Missing	8	1	.4		
Total		259	100		

Survey Results that Disprove the Designation of 'Digital Natives'

Prensky (2001b) states in his paper:

> Someone once suggested to me that kids should only be allowed to use computers in school that they have built themselves. It's a brilliant idea that is very doable from the point of view of the students" capabilities. But who could teach it? (p. 4).

The results of this study do not support such enthusiasm or optimism. An overwhelming majority of the students who responded to this question answered in the negative. Two hundred and ten or more than eighty percent of the participants indicated that they do not know how to build a computer using parts. More than 60 percent of the participants also indicated that they did not always take their computers to school. Table 7 and Table 8 show details of this non-native behavior.

Table 7

Building a computer from parts

		Frequency	Percent	Valid percent	Cumulative percent
	Yes	47	18.1	18.3	18.3
	No	210	81.1	81.7	100.0
	Sub-Total	257	99.2	100.0	
Missing		2	.8		
Total		259	100.0		

Table 8

Taking a computer to school.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	99	38.2	38.2	38.2
	No	160	61.8	61.8	100.0
Total		259	100	100.0	

Prensky(2001a) also stated that "Our students today are all "native speakers" of the digital language of computers, video games and the Internet" (p. 1). Based on this statement it is reasonable to expect that digital natives should prefer to read books online. However, results of this study shows that more than 90 percent of the respondents reported that they do not own a "Kindle or other e-book reader." Equally interesting is the fact that more than eighty percent of the respondents chose the "printed book" over an "electronic book," or "Book published in the form of web pages" in response to the survey question "If a class textbook is published in different formats and all formats cost the same, which format would you prefer?" Table 9 contains this data.

Table 9

Preference for purchasing and reading a textbook

	Frequency	Percent	Valid percent	Cumulative percent
Hardcopy (printed book)	217	83.8	84.1	84.1
Electronic book	20	7.7	7.8	91.9
Doesn't matter	21	8.1	8.1	100.0
Sub-Total	258	99.6	100.0	
Missing	1	.4		
Total	259	100		

Table 10 shows participants' responses to a related question that asked them if they owned a Kindle or some other e-book reader.

Table10

Do you own a Kindle or other e-book reader?

	Frequency	Percent	Valid percent	Cumulative percent
No	243	93.8	93.8	93.8
Yes	16	6.2	6.2	100.0
Total	259	100.0		

If an overwhelming majority of modern digital students prefer to read printed textbooks as opposed to reading them in electronic format, then it makes sense to ask how they prefer to present their class assignments. Nearly seventy-five (193 students or 74.5%) indicated that they preferred to present their assignments face-to-face and not digitally, using tools of modern technology.

Table 11

Preference for presenting an assignment.

	Frequency	Percent	Valid percent	Cumulative percent

Face to face	193	74.5	75.4	75.4
Video (via YouTube)	14	5.4	5.5	80.9
Audiotape	3	1.2	1.2	82.0
Online (via a discussion forum, IR or chat)	46	17.8	18.0	100.0
Total	256	98.8	100.0	
Missing 9	1	.4		
Total	259	100		

According to Prensky (2001a) digital immigrants have 'accents'

The importance of the distinction is this: As Digital Immigrants learn – like all immigrants, some better than others – to adapt to their environment, they always retain, to some degree, their "accent," that is, their foot in the past. The "digital immigrant accent" can be seen in such things as turning to the Internet for information second rather than first, or in reading the manual for a program rather than assuming that the program itself will teach us to use it. (p. 2)

Why would someone have turned to the Internet first in the year 2001? When Prensky (2001a; 2001b) wrote his papers, not all information that the average person or a researcher in a specialized field of study needed was available on the Internet. Due to copyright restrictions, or other considerations, much of the scholarly literature was still outside the purview of the Internet during the year 2001. Nor was the Internet as easy and friendly to use until after the visual interface of the Web became the dominant way of searching and viewing information on the Internet. The same people who, ten years ago would have turned to the Internet as second choice, now search the Internet first before searching elsewhere. Such behavior is dictated by availability of information, convenience, and ease of use.

The same argument can be used for "reading the manual for a program" (Prensky, 2001a, p.2). Programs that were designed, developed and marketed years ago are not as user friendly as more recent versions of the same software packages. Software packages of the past did not "teach" their users. It was usually the other way around. Users had to "learn" how to use software packages. Because online help was not as sophisticated as it is these days, users had to resort to reading manuals in the past, in spite of the fact that such manuals were very technical in nature and hard to read for the average users of the software. It may be true that more people could be using online help features to learn how to use software packages. But is such behavior out of choice or because printed manuals are not being shipped with software packages that can be downloaded using the Web?

Prensky (2001a) claims

There are hundreds of examples of the digital immigrant accent. They include printing out your email (or having your secretary print it out for you – an even "thicker" accent); needing to print out a document written on the computer in order to edit it (rather than just editing on the screen); and bringing people physically into your office to see an interesting web site (rather than just sending them the URL (p. 2).

The person who prints out an email may be doing so to read it later when he or she is not connected to the Internet. Or it could be a matter of choice or preference. A person who asks a secretary to print out an email does not necessarily have a thicker accent. He or she may not have the time to log into a computer and an email account and to read it online. It also makes perfect sense to ask someone to come into your office to look at a web site together and exchange ideas and opinions about the content of the site face-to-face if the other person has an office in close proximity.

The authors of this paper think that what Prensky (2001a) calls an 'accent' is actually a matter of 'choice' or 'preference,' or 'convenience.' We would like to point out that people do things in certain ways because it is either convenient to do so or because for some reason or the other they prefer to do so. As noted earlier, an overwhelming majority of participants in this study reported that they preferred to buy printed textbooks. This is a choice, not an accent. Also, at least one of the authors of this paper viewed the results of the data analysis that was conducted for this study on a computer monitor for a few hours. Then he printed the results on paper and took them home to review them over the weekend. He printed out the results because it is very convenient and easy to jot down ideas on paper as they come to mind.

Conclusion

At the very outset it must be made very clear that the authors of this paper are not opposed to the use of technology to facilitate teaching and learning. They are very much interested in determining effective ways to use technology to

improve teaching and learning in schools, colleges, universities, and other formal and informal educational settings. However, they are also concerned about using un-researched theories and designations to advocate and promote large scale educational reform.

Data from this study suggests that not all people use all the digital tools available in society. Large numbers of the general population as well as participants of this study do use social networking sites, and use them for many hours during any given week. However, over the course of time, preference for one networking site or service has given way to preference for another networking site or service. For example, a few years ago, MySpace.com used to be the most popular social networking site. At the time this paper is being written, Facebook.com is the most favored social networking site. Now Twitter, started as a micro-blogging site, is not slowly being transformed into a social networking site as well, and its popularity and usage are growing considerably. What tool or service is going to become the next king of social networking? Your guess is as good as ours.

Tools and services for social networking that are available to the general public come and go, and people do use them to meet their need to connect, communicate, network, and interact with each other, but they do not necessarily use such sites for purposes of learning content taught in educational settings.

Left to themselves, kids will play games for hours and hours, not just digital games. In many parts of the world, including some parts of the United States, kids have always played real games (as opposed to digital games) with other kids in their neighborhood. Parents have always had to ask kids to stop playing late in the evening so they can eat dinner or finish their school work and go to bed so they can get up early and go to school the next day.

The idea that there are digital natives and digital immigrants is yet to be proven by research. Other authors have also raised some doubts about the two designations (see for example Bennett, Maton, and Kervin, 2010; Brown, and Czerniewicz, 2010; and Salajan, Schonwetter, and Blaine, 2010). All educators should be wary of calls for educational reform that are not based in research, but on pure speculation. Yes, there are some aspects of the two designations that may hold true. Society has always recognized that some people tend to be more techno-savvy than others and that some use technological tools more obsessively and excessively than most others. Society has used terms such as "nerds," and "geeks" to refer to such people. We therefore boldly propose that the designations of "Digital Nerds," and Digital Normals" be used to replace the designations of "Digital Natives" and "Digital Immigrants." We also conclude our paper by suggesting that, at this point in time, the types of educational reforms that Presnky (2001a and 2001b) advocates may be more suitable for the small proportion of 'digital nerds' rather than the larger proportion of 'digital normals' in modern society.

References

Bennett, Sue, Maton, Karl, and Kervin, Lisa. (2010). The 'digital natives' debate: A critical review of the evidence. British Journal of Educational Technology, 39(5): 775-786.

Brown, C., and Czerniewicz. (2010). Debunking the 'digital native': beyond digitsl apartheid, towards digital democracy. Journal of Computer Assisted Learning, 26, 357-369.

Prensky, Marc. (2001a). Digital Natives, Digital Immigrants.*On the Horizon*, *9*(5). Retrieved from the World Wide Web on November 14, 2010: http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf

Prensky, Marc. (2001b). Digital Natives, Digital Immigrants, Part II:Do they really think differently?*On the Horizon*, *9*(6). Retrieved from the World Wide Web on November 14, 2010: http://www.rtmsd.org/744112551813560/lib/744112551813560/Prensky_-_Digital_Natives,_Digital_Immigrants_-_Part2.pdf

Salajan, Florin D., Schönwetter, Dieter J., and Cleghorn, Blaine M. (2010). Student and faculty inter-generational digital divide: Fact or fiction? Computers & Education, 55: 1393-1403.

Willingham, Daniel T. (2010). Ask the cognitive scientist: Have technology and multitasking rewired how students learn. *American Educator: A Quarterly Journal of Educational Research and Ideas*, *34*(2): 23-28.

About the Authors

M.O. Thirunarayanan is Associate Professor of Learning Technologies, Department of Teaching & Learning, Florida International University, Miami, Florida

thiru@fiu.edu

Herminia Lezcano is Training Manager, FIU Online, Florida International University, Miami, Florida

Herminia.Lezcano@fiu.edu

Myra McKee is a Teacher, Miami-Dade Public Schools, Miami, Florida.

Gus Roque is an Instructional Designer, FIU Online,

Gustavo.Roque1@fiu.edu

go top
Februqry 2011
Home Page