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Reconsidering Digital Native and Digital Immigrant in the Schools

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Abstract: There is now an obvious gap of generations in our education system, purported by the proponents of the 'digital native' and 'digital immigrant' resulting in imbalanced of ICT and technology use, skills, preferences and experience. Teachers are digital immigrants while students are digital natives, the latter being more ICT savvy than the former, hence the integration of technology into teaching and learning remains a challenge for many teachers. Recently, however, researchers have long argued that there are differences between the groups of digital natives and digital immigrants. This conceptual paper attempts to illustrate the current literature on the growing interest of digital natives and digital immigrants in the education system.

Keywords: Digital native, digital immigrant, ICT

1. Introduction

"Our students have changed radically. Today students are no longer the people our educational system was designed to teach." (Prensky, 2001, pp 1). According to Prensky (2001), the digital native generation are those born after 1980, in the technology era and are considered as a homogenous group characterized by their skills and preferences in ICT. He described the 'digital immigrant' generation as those older people born before 1980 and they learnt how to use ICT later in their life in which they are being portrayed as hesitant and skeptic when it comes to ICT use. Since Prensky (2001) first coined the term digital native, there are a number of labels to describe the young people currently studying at schools, colleges and universities in order to emphasize the significance and importance of new technology in their lives. Further, the younger generations are as described digital natives because they live in the information age, know how to maneuver ICT gadgets even before they are able to speak which has a profound effect in their study, work and social lives (Palfrey & Gasser, 2008).

Digital immigrants on the other hand are the opposite of digital native when it comes to embracing and adapting technology (Prensky, 2001). The older generation who are known as the digital immigrants are less proficient in ICT and will only use ICT when they have no choice (Ransdell, Kent, Gaillard-Kenney & Long, 2011). This raises the question as to how well schools are preparing students for the future if they continue to dwell on these tools in support of teaching and learning process.

2. Digital Native - Who might they be?

There is no commonly-accepted definition of the younger generations in which the concept varies among individuals, societies, regions and nations, and also over time (Gallardo-Echenique, Marqués-Molías, Bullen, & Strijbos, 2015). According to the literature, each way of describing this new generation carries with it some distinct features but in general the terms are used interchangeably (Jones, Ramanau, Cross, & Healing, 2010; Helsper & Eynon, 2010; Gallardo-Echenique, 2014). An integrative literature review was performed on 355 articles (both qualitative and quantitative) on digital natives which was published between 1991 and 2013 and the

review found 46 terms related to the notion of this new generation of students and the most common terms in circulation are: Net Generation, Digital Natives and Millennials (Gallardo-Echenique, 2014).

The existence of a generation of digital native is based on two main assumptions in the literature as summarized as follows: i) young people of the digital native generation possess sophisticated knowledge of and skills with information technologies; and ii) as a result of their upbringing and experiences with technology, digital native have particular learning preferences or styles that differ from earlier generations of students (Benett, Maton, & Kervin, 2008).

This rising generation is growing up immersed in technology that has a profound effect in the ways they learn, interact, and envision the world. That is why most of today's tertiary students, and children in primary and secondary schools are much more knowledgeable, comfortable, proficient and literate than their parents or teachers when it comes to technology (Prensky, 2001; Ivanova & Ivanova, 2009; Tapscott, 2010; Jones et al., 2010; Sánchez, Salinas, Contreras, & Meyer, 2011; Firat, 2013; Hall, 2016). The research evidence to date indicates that a proportion of young people are highly adept with technology and rely on it for a range of information gathering and communication activities (Benett et al., 2008; Gu, Zhu, & Guo, 2013).

Ivanova and Ivanova (2009) described the younger generations in Bulgaria as visually literate, fluent in expression through images, more comfortable in video and image-rich environment, and prefer learning by doing and first-person experience than by reading, want to be connected and mobile and would appreciate incorporation of social WEB-services and game-oriented tools into learning.

The young learners act differently to learning approaches as they are more concerned with the speed of access, instant gratification and constant connection (Bayne & Ross, 2011). At the same time, they are impatient with linear thinking and the ability to multitask, and prefer image and information in digital form (Bayne & Ross, 2011). They argue that since the young people have grown up with computers and the Internet, they are naturally proficient with new digital technologies and spaces, while older people will always be a step behind with regard to digital technologies. In the Canadian context, Smith (2012) identified them as: i) driving a digital revolution transforming society; ii) inherently tech-savvy; iii) are multi-taskers, team-oriented, and collaborative; and iv) embrace gaming, interaction and simulation. Firat (2013) asserts that today digital native are using computer, Internet and mobile technologies on a daily basis.

There were few studies carried out to identify digital natives in the Malaysia education system. For example, a total of 328 questionnaires were collected from the students from three academic disciplines: Sciences, Social Sciences and Economics that enrolled in Foundation English and English for Academic Purposes (EAP) course at a university to investigate undergraduate students' patterns and perceptions of ICT use for learning English (Thang, Jaafar, Nambiar, Amir, & Wong, 2014). The findings revealed that students' reception towards the use of technology was very positive and ICT is essential and beneficial in language learning. Although they prefer more technology-rich courses, students' use of ICT are mostly for recreational purposes as compared to academic purposes. All of the students used Facebook, emails and blogs to connect and communicate with each other on a daily basis.

In a later study, Yong et al., (2016) conducted a casual-comparative study from two different disciplinary schools at a private university in Malaysia. The objective of the study was to explore Malaysian university students' use of digital technologies. A total of 191 students responded to the online survey that assessed their ICT use for academic and non-academic purposes. This study has shown that the pre-university students are 'being' the digital natives and 'doing' the digital native activities. However, students used ICT for non-academic activities (76% or 15.6 hours per day) much more than for academic activities (24% or 4.95 hours per day).

3. Digital Immigrant

In contrast to digital natives are digital immigrants. Conceptions of the digital native and digital immigrant began to take shape in the late 1990s and early 2000s, when a growing number of publications began describing an urgent need to recognize and adapt to the characteristics of a new generation of students (Smith, 2012).

Being portrayed as the older generation, digital immigrants are born before 1980s (Prensky, 2001). Unlike the groups after them, digital immigrant was not immersed in technology growing up hence they are hesitant and skeptic when it comes to ICT use. Further, a study in one American University found that majority of students in their 40s and older are less confident in using technology for education (Ransdell et al., 2011). The study suggests that they need to be encouraged to be more confident and less cautious about their technological skills.

This is true because, although digital immigrants can "speak the same language" as digital natives but often times speak with an "accent" when they refer to actions that limit the use of technology such as printing a document to edit rather than editing the document virtually (Prensky, 2001). A study revealed that educators in two British Universities are unmindful of the potential of ICT because they themselves are not using emergent technologies for their own learning and work (Margaryan, Littlejohn, & Vojt, 2011). The study further illustrated that while some of them recognize the educational value of some emergent technologies, others view these as 'fads'. Taking that into perspective, digital immigrant makes up the majority of educators today while students are all from the digital native generations in the education settings. Hence, this situation could become problematic and remain a challenge for the school leaders and teachers who are not native to ICT to integrate and champion ICT in the schools.

4. Digital Immigrants, Digital natives – Closing the gap.

There are many proponent as well as critics on the notion of digital native and digital immigrant as described by Prensky (2001). Recent studies seemed to dismiss the idea of generalizing the younger students as more proficient in ICT than the older generation, the digital immigrants. First of all, Thompson (2013) argued that the digital native generation is not universal in terms of digital technology proficiency because the range of technologies students use are limited. While digital natives use a wide range of technologies for personal empowerment and entertainment, they are not always digitally literate in using technology to support their learning (Kennedy & Fox, 2013). The literature indicates that students seems to devote more time on-line on entertainment than on academic pursuits (Yong, Gates, & Harrison, 2016). This is true when a study found that students' used the computer and the Internet for mostly non-school activities (Sánchez et al., 2011).

Although students have a wide-ranging access to ICTs and ICTs are frequently and heavily integrated into everyday activities, there are differences in the intensity of this use (Sánchez et al., 2011). The finding discovered that ICT usage among students in the Chilean context vary in intensity in which some are highly intense and sophisticated uses while others make a far less intense use of it. In their qualitative study which involved 20 students, they found that students' use of ICTs depends on gender, type of ICTs use, and meanings that they attribute to ICTs. Thus, the findings of the study do not coincide with the image of a more homogeneous generation as predicted by Prensky (2001). Firat (2013) claim that as a result of the daily usage of the computer, Internet and mobile technologies, digital native now 'suffers' from Continuous Partial Attention (CAP) and Multitasking conditions. Although Multitasking may increase production but CAP increases high stress level to digital native.

Further, the digital immigrant/native metaphor is limiting innovative teaching because the concept of digital immigrant in this metaphor has been characterized as someone who i) cannot and will not adapt to change; ii) cannot relate with digital native; iii) are skeptic and hesitant to changes; iv) are intimidated by the technologies; and iv) are easily frustrated due the lack of skill in using technologies (Wolsey & Grisham, 2011). As there are differences, as well as similarities between generations, age is not the sole predictor in ICT proficiency. Besides the age factor, education, experience, income, and social play an important role in predicting ICT proficiency in digital native and immigrant as well (Williams, 2015; Martin, 2011).

With the advance of ICT and learning autonomy, 'digital immigrants' are gaining the necessary knowledge and skills and quickly adapting to ICT use to attain 'digital competence' (Helsper and Eynon, 2010). They argue that the generation factor is not the sole predictor of advanced interaction with the Internet but breadth of use, experience, self-efficacy, gender and educational levels are also important, and in some cases more important than generational differences. This study has offered some indication for the education community that educators will not remain immigrant to ICT

forever. Over time, digital immigrant can and will progress in ICT proficiency, perhaps not as native as the students but the gap between them is getting narrow. Vice versa, based on a case study in Houston, Texas which described the application of technology in the instructional practices of five Digital Native teachers, Williams (2015) found that it is wrong to assume all Digital Native teachers are Digital Native to the full extend. Although they grow up immerse in technology, some of them lack of experience and expertise using technology in classrooms. Alas the Digital Native teachers are not that different from the Digital Immigrant teachers when it comes to teaching with technology.

This idea of closing in the gap in ICT proficiency between them holds true when a study of 988 users determined that digital immigrants used the Doctoral Community Network more often and for a larger variety of purposes than digital natives did (Berman & Hassell, 2014). Specifically, they found that digital immigrants log-on more frequently, read more blogs, use more doctoral community network research resources, and send and receive more peer messages than digital natives do. Further, according to Wolsey and Grisham (2011), teachers who learned to use technologies can actively partake and involve in the twenty-first century learning environment. Moreover, a recent study based on 223 participants revealed that there was no significant difference in instructional technology use between the digital native and digital immigrant faculty members at a university (Johnson, 2018). The aforesaid findings are evidence that digital immigrant has the ability to advance ICT use just as good as the digital native because, contrary to popular beliefs, digital immigrant can be proficient in ICT just as the digital native (McAuley, Stewart, Siemens, & Cormier, 2010).

5. Conclusions

In a nutshell, many studies seemed to show that the young people, be it digital native, net generation, Google generation or millennials, are different from the previous generation when it comes to ICT preference. Although they are not homogeneous in their ICT proficiency but they all embrace ICT openly and use them as a way of life. It is important to acknowledge that there is a great deal of variance among the distinguishing characteristics within any given generation (Kennedy, Judd, Churchward, Gray, & Krause, 2008; Prensky, 2009) and that the education of tech-savvy students is still a major issue for education activities (Benett et al., 2008; Lieve, Malin, & Barbara, 2010; Sim, 2011).

Perhaps the concept of digital immigrants and digital natives was true enough for the last decade but as individuals grow at personal and professional levels, the differences between them is getting less as it used to be. The image of digital immigrants as disbelievers of ICTs, incapable of handling ICTs tools, and refusing to participate in ICTs related activities is no longer applicable today than it was yesterday.

The aforesaid discussion provides some rational to the notion that the young students in schools today are definitely a different group of learners as their teachers or parents once were. They are different because of ICT and Internet proliferation occurs during their time in which they get to experience the benefits of living in digital age with Facebook, online gaming, Skype or online video calls, portable and digital devices, smart phones and the likes which offer instant and real-time communication. Recent studies discover that teachers have the ability to be as proficient in technology as the students in due time and perspective. As time goes by, more training is provided for teachers, better ICT infrastructure is provided to schools, the importance of technology and teaching becomes imminent, teachers will be as native as the students.

In a nutshell, how schools respond to the phenomena is key to student success. Inevitably, schools must leverage on how digital natives live and learn and implement new strategies in teaching and learning process (Jackson, 2013; Konting, 2016; Zhong, 2016). Although the Internet and ICT proliferation did not start with the intention of education, eventually, the hype has also got into the education system resulting in substantial funding by governments all over the world to invest in ICT application in support of teaching and learning. And now, with the new image of digital natives and digital immigrants, the task of integrating ICT into teaching and learning is seemed less daunting to the teachers. Students are not as superior as they were once thought and teachers will not remain alien to the digital age indefinitely.

References

Bayne, S., & Ross, J. (2011). Digital Native and Digital Immigrant Discourses. *Digital Difference: Perspectives on Online Learning*, 50(1993), 159–169. doi: 10.1007/978-94-6091-580-2_12

Benett, S., Maton, K., & Kervin, L. (2008). The "digital natives" debate: A critical review of the evidence. *British Journal of Educational Technology*, 39(5), 775–786. doi:10.1111/j.1467-8535.2007.00793.x

Berman, R., & Hassell, D. (2014). Digital Native and Digital Immigrant Use of Scholarly Network for Doctoral Learners. *Journal of educators Online*, 11(1), n1.

Firat, M. (2013). Multitasking or continuous partial attention: A critical bottleneck for digital natives. *Turkish Online Journal of Distance Education*, 14(1).

Gallardo-Echenique, E. (2014). An integrative review of literature on learners in the digital era. *Studia Paedagogica*, 19(4), 161–184. doi: 10.5817/SP2014-4-8

Gallardo-Echenique, E. E., Marqués-Molías, L., Bullen, M., & Strijbos, J.-W. (2015). Let's Talk about Digital Learners in the Digital Era. *International Review of Research in Open and Distributed Learning*, 16(3), 156–187. doi: 10.5430/ijhe.v3n1p94

Gu, X., Zhu, Y., & Guo, X. (2013). Meeting the "Digital Natives": Understanding the acceptance of technology in classrooms. *Educational Technology and Society*, 16(1), 392–402. doi:10.2307/jeductechsoci.16.1.392

Helsper, E. J., & Eynon, R. (2010). Digital natives: where is the evidence? *British Educational Research Journal*, 36(3), 503–520. doi: 10.1080/01411920902989227

Ivanova, A., & Ivanova, G. (2009, June). Net-generation learning style: a challenge for higher education. In *Proceedings of the International Conference on Computer Systems and Technologies and Workshop for PhD Students in Computing* (p. 72). ACM.

Jackson, D. B. (2013). The Relationship Between Principals' Technolgical Leadership and Their Schools' Implementation of Instructional Technology. Georgia Southern University.

Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net generation or Digital Natives: Is there a distinct new generation entering university? *Computers and Education*, 54(3), 722–732. doi:10.1016/j.compedu.2009.09.022

Johnson, K. E. (2018). Digital Native and Digital Immigrant Professors' Self-Assessments of Instructional Technology Usage in College Classrooms (Doctoral dissertation, The University of Alabama).

Kennedy, D. M., & Fox, B. (2013). "Digital Natives": An Asian Perspective for Using Learning Technologies. *International Journal of Education and Development using Information and Communication Technology*, 9(1), 64-79.

Kennedy, G. E., Judd, T. S., Churchward, A., Gray, K., & Krause, K. L. (2008). First year students' experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology*, 24(1), 108–122. doi: 10.1007/s13398-014-0173-7.2

Kennedy, K. T. (2015). Requisite Skills and Knowledge Principals Perceive Necessary to Successfully Integrate Technology at the Middle School Level. The Sage Colleges.

Konting, M. M. (2016). *Teaching for quality learning : A Leadership Challenge*. UPM Press.

Lieve, V. den B., Malin, C., & Barbara, G. (2010). Learning, Innovation and ICT: Lessons learned by the ICT cluster Education & Training 2010 programme. European Commision. Retrieved from http://www.kslll.net

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & education*, 56(2), 429-440.

Martin, M. E. (2011). Digital Natives and Digital Immigrants: Teaching with Technology. Northeastern University. Retrieved from https://repository.library.northeastern.edu/files/neu:1188/fulltext.pdf

McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). The MOOC model for digital practice. doi:10.1016/j.im.2011.09.007

Palfrey, J., & Gasser, U. (2008). Born Digital: Understanding The First Generation of Digital Natives. Basic Books.

Prensky, M. (2009). H. sapiens digital: From digital immigrants and digital natives to digital wisdom. *Innovate: Journal of Online Education*, 5(3), 1–9.

Prensky, M. (2001). Digital natives, digital immigrants part 1. On the horizon, 9(5), 1-6. doi:10.1108/10748120110424816

Ransdell, S., Kent, B., Gaillard-Kenney, S., & Long, J. (2011). Digital immigrants fare better than digital natives due to social reliance. *British Journal of Educational Technology*, 42(6), 931-938. doi:10.1111/j.1467-8535.2010.01137.

Sánchez, J., Salinas, A., Contreras, D., & Meyer, E. (2011). Does the new digital generation of learners exist? A qualitative study. *British Journal of Educational Technology*, 42(4), 543–556. doi:10.1111/j.1467-8535.2010.01069.

Smith, E. E. (2012). The Digital Native Debate in Higher Education: A Comparative Analysis of Recent Literature. *Canadian Journal of Learning and Technology*, 38(3), n3.

Sim, Q. C. (2011). Instructional leadership among principals of secondary schools in Malaysia. *International Research Journals*, 2(December), 1784–1800.

Tapscott, D. (2010). Grown Up Digital: How the Net Generation is Changing Your World. New York, USA: The McGraw-Hill Companies. doi: 10.2501/S1470785310201119

Taylor, L., & Parsons, J. (2011). Improving Student Engagement. Current Issues in Eudcation, 14(1), 1–33.

Thang, S. M., Jaafar, N. M., Nambiar, R. M. K., Amir, Z., & Wong, F. F. (2014). Are Malaysian undergraduates "digital natives" in the true sense of the word? A quantitative analysis. 3L: Language, Linguistics, Literature, 20(1), 177–191. doi: 10.17576/3L-2014-2001-14

Thompson. (2013). The digital natives as learners: Technology use patterns and approaches to learning. *Computers & Education*, 65, 12–33. doi: 10.1016/j.jwb.2007.10.005

Williams, J. K. (2015). A Case Study: How Digital Native Elementary Teachers Use Information Communication Technology To Teach Students. (Unpublished doctoral dissertation). Texas Tech University.

Wolsey, T. D., & Grisham, D. L. (2011). A Nation of Digital Immigrants: Four Principles. The California Reader, 44(2), 1–9. Retrieved from http://www.californiareads.org/res/TCR_editorial-44-2.pdf

Yong, S. T., Gates, P., & Harrison, I. (2016). Digital Native Students–Where Is The Evidence?. *The Online Journal of New Horizons in Education*, 6(1), 46-58. Retrieved from https://www.tojned.net/journals/tojned/volumes/tojned-volume06-i01.pdf#page=54

Zhong, L. (2016). The Effectiveness of Digital Leadership at K-12 Schools in Mississippi Regarding Communication and Collaboration During CCRS Implementation. (Unpublished doctoral dissertation). The University of Southern Mississippi.