New Terms for the Educators' Digital Lexicon

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Abstract

In 2001, Presky introduced the terms "digital immigrant" and "digital native". Currently, the educators' digital lexicon is insufficient to address educational success. The authors present terms augmenting the educators' digital lexicon. The authors propose terms expanding the digital lexicon including another class of learner – the digital Neanderthal and terms for educators to consider including digital concordance, digital discord, digital disruption, and digital dissonance. These terms are a result of members of each digital class not considering their learners. Unless instructors adopt learning theories amenable to appropriate classes of learners in the digital landscape, they will be barriers to learning instead of facilitators. If students are taught without regard to their digital demographic, educators will lose a vital opportunity to engage students regardless of their digital demographic. Administrators must also consider the faculty digital demographic when implementing technical innovations as this demographic may highly impact its success or failure. The authors are unaware of other work highlighting or conceptualizing this new class of learners or educators. Further, to our knowledge, we are unaware of the concepts presented here being presented elsewhere. The consideration of these concepts is critical to the success of students and our educational institutions, today and in the future.

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Introduction

In 2001 Prensky coined the terms "*digital immigrant*" and "*digital native*" (Prensky, 2001a) discriminating between contemporary students growing up in the digital age and those predating them. The early 2000s represented the first generation of students to grow up with new technology, often now referred to as smart technology, having spent their lives surrounded by and using the tools and toys of the contemporary digital age (Prensky, 2001a). As Prensky posited, the distinction is important because, as a result of a continuous immersion in this environment, contemporary students

process and think in a fundamentally different way than their parents (Prensky, 2001a, 2001b).

So, where is the line of demarcation defining the difference between the digital immigrant and digital native? This is a challenging line to define because, as the technology available to support the learning process advances, that line of demarcation moves. When these terms were first applied to clinical education, particularly in the context of game- and simulation-based teaching and learning, *it was often said if one remembers using the rotary phone, and certainly the pre-cell phone era, one is a digital immigrant.* Later, the narrative changed to *if you remember the time a cell phone was just a cell phone and not a multi-function internet-enabled smart device, one is probably a digital immigrant.* In the end, the demarcation and categorization of who belongs to which group, digital immigrant versus digital native, seems more matter of adaptability rather than a fixed point in time. By this we mean those struggling to adapt to and leverage new and evolving technology versus those who embrace it. From this perspective, the notion of who are or remain digital immigrants versus who are digital natives represents more of a continuum and philosophy rather than a binary designation. Given the discourse of how to define what it means to be a digital immigrant versus a native, and what that means within a social, academic, or healthcare community, the notion of a continuum of where people fit into a *digital ecology* is probably more accurate, because familiarity or comfort with digital technologies is not the same as expertise within the contemporary digital ecology (Selwyn, 2009; Stoerger, 2009).

In 2009, Prensky introduced the term *digital wisdom*, which seems to address the perspective of adaptability (Prensky, 2009). Prensky defines digital wisdom as *"… a twofold concept, referring both to wisdom arising from the use of digital technology to access cognitive power beyond our innate capacity and to wisdom in the prudent use of technology to enhance our capabilities.*" (emphasis added) (Prensky, 2009). Presky describes President Obama as someone who has digital wisdom when in the 2008 election then-candidate Barak Obama digitally connected with potential voters, constituents, and contributors. To this end, the line of demarcation may be impossible to define, or rather less relevant to define. Instead, how one comes to leverage technology to drive understanding and outcome, particularly in the context of teaching, learning, and healthcare is much more relevant or salient to professional development and our ability to teach, guide, and mentor today's learners and care for sick populations.

The term digital wisdom also applies to a term the authors introduce into the digital lexicon, the digital Neanderthal or digitally illiterate. The *digital Neanderthal* or *digitally illiterate* is unable to, unwilling to, or incapable of digital emigration. *Digital emigration* is the act of moving from one digital state to another. One who cannot, will not, or is incapable of digital emigration is a digital Neanderthal or digitally illiterate. Within the context of Prensky's digital immigrant-digital native paradigm and distinction among the digital population, the authors postulate the population of digital Neanderthals or digitally illiterates have been neglected. Although the population of digital Neanderthals or digitally illiterate falls on the extreme opposite of the non-binary continuum of the savviest digital native, this population is incredibly important to consider, and has been largely ignored and unrecognized. It is time, and it is important, to formally recognize this end of the digital continuum.

A Gap in the Digital Lexicon

Learning theories such as Bauman's Layered Learning Model have been proposed to explain how faculty and other instructional staff who find themselves somewhere in the chasm separating digital immigrants and natives can actively and effectively engage contemporary digital natives (Bauman, 2016; Bauman et al., 2017, 2014; Felszeghy et al., 2019). In other words, how the temporal immigrant can engage the temporal native through wisdom, rather than brute force. Contemporary or temporal digital natives come to our institutions with a host of expectations of how educational materials may be presented and made accessible. If educators fail to meet these expectations, we risk alienating the very populations we are charged with mentoring. The new educational paradigm sees the savviest teachers as guides who can leverage their digital wisdom to help students determine what must be committed to memory and what can and should be accessed and carefully vetted electronically among the vast amount of unfettered content continuously available to students (Prensky, 2010, 2012).

Prensky defines digital natives as "…students [who] are all 'native speakers' of the digital language of computers, video games and the Internet." suggesting that digital immigrants are "Those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology…" (Prensky, 2001a). However, the authors believe that this categorization ignores a substantial aspect of the population – those who are not willing or capable of interfacing with technology, technology that is rapidly changing and evolving. Those ignored or forgotten are those who despite multiple attempts, and possibly dire consequences, have not and will not change their behavior to accommodate and leverage new technologies into their lives.

This distinction is important mainly for two reasons. The first distinction occurs when temporal digital natives are being taught by digital Neanderthals or digitally illiterates. The second distinction occurs when digital Neanderthals or digitally illiterates are being taught by temporal digital immigrants or natives using contemporary digital pedagogy. Anecdotal evidence suggests digital Neanderthals or digitally illiterates may be resistant to change in the face of the implementation of digital curricular evolution. For example, a faculty composed of digital Neanderthals or digitally illiterates might be less likely to implement the adoption of tablet or slate computers on campus or embrace the implementation of game-based teaching and learning activities as adjuncts to the curriculum, let alone a technique to deliver core content. Likewise, the digital Neanderthal as a student may find it difficult if not impossible to engage and embrace unfamiliar digital learning platforms such as learning management systems, let alone educational tools and techniques such as game-based learning and simulation, particularly when these experiences embrace completely novel technology such as virtual and augmented reality and artificial intelligence. The authors suggest that this disconnect has negative effects on learning. This paradigm represents what the authors term *digital discord*. The authors propose digital discord as a mismatch in the pedagogy among teachers and learners. (Conversely, *digital concordance* would be a match in terms of digital ecology – digital immigrants teaching digital immigrants, or digital Neanderthals caring for digital Neanderthals.) It is this digital

discord that is disruptive to the learning and healthcare processes.

An additional reason why it is important to be able to identify digital discordance is because of the impact that it can have on health professions education and ultimately patient outcome. Being a digitally literate clinician means embracing and understanding the concept of digital wisdom within one's practice. Digital literacy moves beyond the ability to navigate the electronic medical record. Medical and health professions educators must be in the position to not only provide guidance for their students, but also provide strategies to their students about how they might engage patient populations who are spread across the digital continuum.

Consequences of Digital Discord

Technology continues to evolve rapidly without regard to the population it serves. For example, it is now commonplace for patients to be sent home for extended cardiac monitoring with technology such as the MCOT telemetry patch system (Malvern, PA USA). However, these systems are more often designed from a data collection perspective without careful user interface and user experience consideration from either the patient's or the clinician's perspective. Is it reasonable to assume that all clinicians forced to adopt such technology may be digital immigrants capable of embracing this medical technology, or all patients needing such technology may not be digital Neanderthals?

Much in the same way a faculty of predominately digital Neanderthals or digitally illiterates often fails to meet the expectations of digital natives, digital discord occurs when there is a mismatch of pedagogy and technology solutions being used to deliver the curriculum. Similarly, digital discord can occur in healthcare. Digital discord may be even more pronounced and frustrating when digital Neanderthals or digitally illiterates find themselves in a student or learner role (or patient) that requires them to embrace contemporary technology and pedagogy without accommodation that is completely unfamiliar to them. (Perhaps learning materials upon discharge from the hospital.) The importance of appropriate learning theory selection, technology selection, and integration strategy must be considered based on the population of learners or patients being engaged.

The digital Neanderthals or digitally illiterate are unlikely to be able to accept pedagogical approaches or technological applications outside their familiar educational perspective. Regardless of the instructor, the Neanderthal or illiterate cannot frame contemporary pedagogical or healthcare philosophy. While the immigrants may be capable of straddling both educational and healthcare eras, ignoring contemporary learners' and patients' preferences as it relates to innovative technology means that we are failing to leverage the digital ecosystem to its potential. Synergy among pedagogy and technology only occurs when instructional designers, faculty, and healthcare technology developers carefully tailor instruction to avoid digital discord and promote digital concordance. In other words, digital concordance represents the positive synergistic effect that occurs when technology and pedagogy are carefully and thoughtfully selected to promote effective knowledge transfer, understanding and behavioral change within the context of the curriculum or healthcare

objectives.

Conclusions

In this essay, the authors have recommended new terms be added to the digital lexicon Prensky introduced nearly 20 years ago: digital Neanderthal, digital illiterate, digital discord, and digital concordance. Instructors should promote digital concordance by tailoring their instruction to their audience. For example, we advocate embracing contemporary pedagogy that supports digital technology when engaging today's traditional college students. However, we hope that teachers will not abandon traditional instructional methods when engaging populations of digital Neanderthals. As technology continues to evolve, teachers will need to constantly evaluate what pedagogical technological best practice looks like. Further, because we acknowledge that the digital native-digital Neanderthal paradigm is a non-binary continuum, we urge teacher's healthcare technology developers, and healthcare educators to take a layered learning approach to learner engagement. Failing to do so may only frustrate the learner and teacher, resulting in negative educational and healthcare outcomes.

Author Contributions

EBB coined the term "digital Neanderthal" and GEG proposed the idea of a manuscript. GEG composed the first manuscript draft. Both authors contributed to subsequent revisions of the manuscript. Both authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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