

## From digital natives to digital literacy: Anchoring digital practices through learning design

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While the academic community and the general public often refer to learners today as inherently tech-savvy digital natives, those in the educational technology community have long advocated for a move away from digital native stereotypes in favour of fostering digital literacy. As such, the educational technology community can play a vital role in shifting from popular conceptions of digital natives and toward developing digital literacy for the benefit of all learners. In this paper, we provide a comparative analysis of search data from Google Trends showing continued use of the term digital natives and the rising interest in digital literacy. In order to help educators move away from popularized concepts of digital natives by instead developing digital literacy in three domains, we propose a conceptual framework for anchoring digital practices within a Learning Design model.

Keywords: digital natives, digital literacy, learning design, educational technology.

### Introduction

Amongst the general population and within academia, there is a continued fascination with *digital natives*, a term coined at the turn of the twenty-first century. As many within the educational technology community know, conceptions of digital natives position students within the Millennial or Net generation as being inherently tech-savvy and ubiquitous consumers and producers of technologies, especially social media. Prensky's work (2001) popularizing the concept of the digital native is widely referenced, evidenced by his over 21,000 citations within Google Scholar as of October 2018. While the overall academic community shows continued interest in digital natives, there is a notable decline in the use of the terms "digital natives," "Millennials," and "Net generation" within educational technology journals, indicating that the educational technology community appears to be moving away from these stereotypes (Judd, 2018). At the same time, across communities there is growing interest in the concept of digital literacies, which focus on the ways in which technology uses and preferences are learned.

In light of these disparate trends, we argue that those in the educational technology community can play a vital role in fostering meaningful change by addressing calls to move away from stereotypical ideas of digital natives (e.g., Brown & Czeriewicz, 2010; Kennedy, Judd, Dalgarno, & Waycott, 2010) through the development of digital literacy (Smith, 2017). Through an analysis of search data from Google Trends, we illustrate continued use of the term *digital natives* and, comparatively, the rising interest in *digital literacy*. In order to move away from concepts of digital natives and toward fostering digital literacy in all students, we propose a conceptual Learning Design framework for developing a robust set of knowledge and skills within three domains of digital literacy.

### Defining digital natives and digital literacy

While continued popularity of the terms "digital natives," "Net generation," and "Millennials" is well established (Judd 2018), little research has compared the sometimes-conflated yet decidedly distinct terms of "digital natives" and "digital literacy." Both terms originated around the turn of the twenty-first century, but while the term digital natives often implies inherent or innate abilities to use and understand technologies, the term digital literacy emphasizes the process of *learning* to effectively use technologies.

Digital native proponents argue that students in the Net generation, also known as Millennials, are unique in contrast to their digital immigrant elders because young people born in this era have always known a world with digital technologies and the Internet. An extensive literature analysis of foundational, recurring digital native claims shows



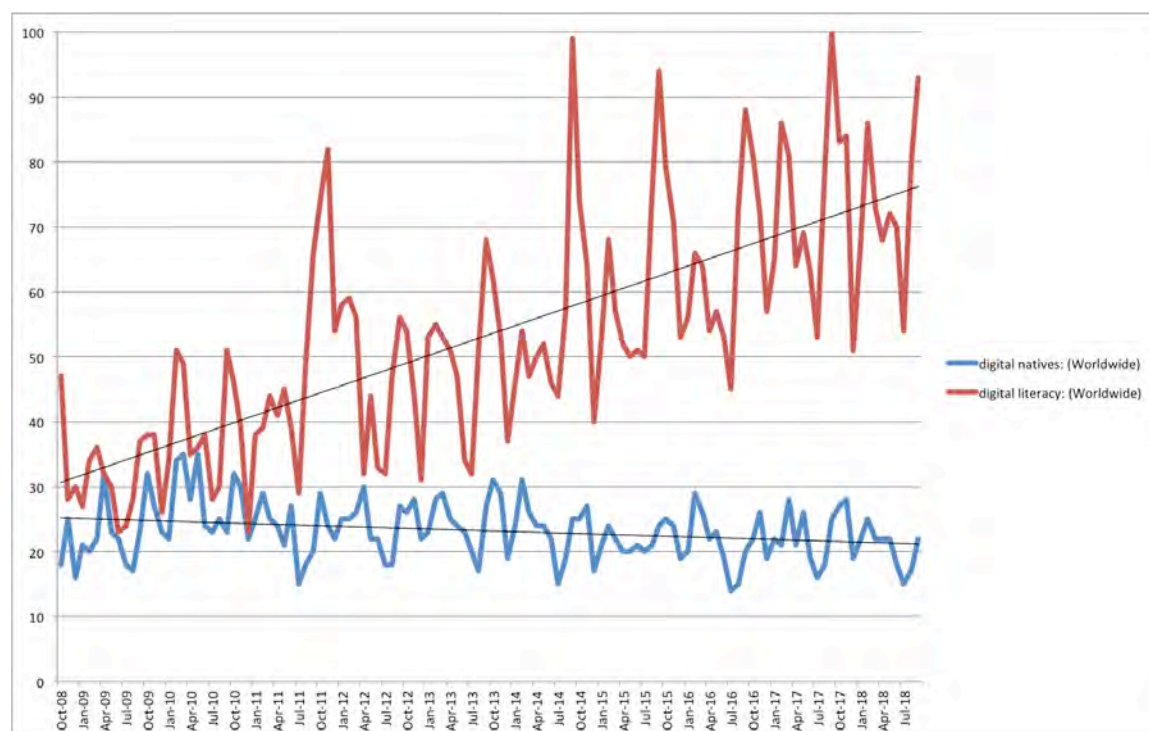
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eight dominant themes defining Net generation students as those who 1) possess new ways of knowing and being; 2) drive a digital revolution transforming society; 3) are innately or inherently tech-savvy; 4) are multitaskers, team-oriented, and collaborative; 5) are native speakers of the language of technologies; 6) embrace gaming, interaction, and simulation; 7) demand immediate gratification; and, 8) reflect and respond to the knowledge economy (Smith, 2012, pp. 6-7). Nevertheless, evidence from leading researchers and practitioners within the educational technology community has largely shown the digital native to be an unevicenced stereotype, and as such, it is not a particularly accurate or useful portrayal of students' technology needs or abilities (e.g., Bennett & Maton, 2010; Hargittai, 2010).

Contrary to ideas of digital natives, the original definition of digital literacy highlighted a developmental process whereby people build mastery of ideas, not just keystrokes (Gilster, 1997, p. 15). Digital literacy is often defined as “the ability to use information and communication technologies [ICTs] to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (ALA Digital Literacy Taskforce, 2012, para. 2). In this way, definitions of digital literacy often incorporate complimentary aspects of the *information literacies* needed to effectively locate, evaluate, and use information. Additionally, digital literacy reflects aspects of *multiliteracies* or *new literacies* (Baker, 2010) focusing on new ways of studying and understanding literacy in the twenty-first century as closely associated with ICTs (Lankshear & Knobel, 2003) and, relatedly, notions of digital natives (Ng, 2012). Recognizing these overarching concepts, we argue that digital literacy requires mastery of knowledge and skills within three domains: the **procedural and technical** domain for those *operational, procedural, or technical skills required* for functional aspects of the technology; the **sociocultural** domain encompassing the ways in which technologies are *shaped by and reflect the sociocultural contexts* within which they are created and used; and, the **cognitive** domain for those *cognitive aspects required for effective technology use* including the need to process information, form schemas for information retrieval, and make metacognitive connections.

## A comparative analysis of search trends

A comparative examination of the usage of these search terms (see Figure 1) allows us to consider, within a snapshot of the last decade, trends reflecting the level of popularity and interest for these topics.



**Figure 1: Graph of Google Trends search data over the past 10 years (worldwide).** This graph shows interest related to the search terms “digital natives” (blue) and “digital literacy” (red) since October 2008. According to Google, these “numbers represent search interest relative to the highest point on the chart for the given region and time,” with 100 for peak popularity and 50 indicating a search term is half as popular.

As can be seen in Figure 1, overall search interest in “digital natives” remains relatively constant over the past decade. Comparatively, Google Trends data reveals growing interest in “digital literacy,” with peak popularity for this term occurring in October 2017. While such trends can vary geographically, potentially due to language differences and other regional variations (Stocking & Matsa, 2017), when examining additional Google Trends data according to geographical area during this time, researchers found similar trends for these search terms in the UK, US, Canada, and Australia.

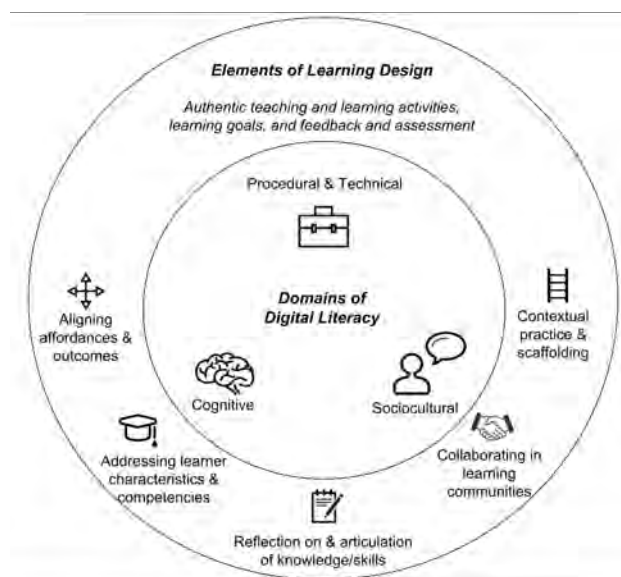
The Google Trends search data illustrates that while the term “digital natives” persists, growing interest in the topic of “digital literacy” presents an opportunity to move toward evidence-informed dialogue about learning and technologies across generations.

## **Anchoring digital literacy through learning design**

Digital native stereotypes remain popular, suggesting that educators are looking for ways to connect with their students and foster meaningful use of technology. However, our analysis of the literature suggests that when such efforts rest on digital native stereotypes, they are misguided at best. At worst, they may be harmful because young learners don’t necessarily come with all of the knowledge and skills they need, and when educators assume that they do, valuable learning opportunities are likely missed. Thus, the educational technology community can support a movement toward the more useful construct of digital literacy by providing a clear Learning Design (LD) framework in order to guide educators toward meaningful and robust technology integration.

To help shift discussions from a focus on digital natives to the development digital literacy, those in the educational technology community can play an important role in helping educators to facilitate effective digital practices through effective designs for learning. Mor and Craft (2012) define Learning Design as “the deliberate shaping of form in response to function. LD is the act of devising new practices, plans of activity, resources and tools aimed at achieving particular educational aims in a given situation” (p. 86). *The Larnaca Declaration on Learning Design* (Dalziel et al., 2016) articulates a clear connection between LD and digital literacy. Walker and Kerrigan (2015) advocate for further work connecting these two areas: “The challenge for Learning Design theory and the further development of the Larnaca Declaration is not only to embed critical digital literacy into the development of learning practices, but also to contextualize this as part of successful Learning Design” (p. 99). Mor, Craft, and Main (2015) emphasize the importance of conceptualizing a model prior to design of particular learning activities. To address this challenge of embedding digital literacy in LD while at the same time recognizing the importance of first conceptualizing an overarching model to guide this process, in the following section we propose a model for embedding the three domains of digital literacy within a Learning Design framework that aims to provide a foundation for fostering effective digital practices.

To inform this model, we consulted the design literature for recurring elements of designs for learning that can anchor an overarching pedagogical approach to digital literacy. Fink’s (2003) work engages with strategies for designing significant learning experiences, and emphasizes the importance of *situational factors*, such as learner characteristics and disciplinary context, that inform the key components of integrated course design: teaching and learning activities, learning goals, and feedback and assessment (p. 62). These inform the essential foundations of Learning Design for digital literacy represented at the top of Figure 2. Likewise, Herrington and Oliver (2000) demonstrate that for authentic learning to occur, particularly in online environments, elements of *situated learning* can foster application of knowledge and skills within real-life contexts. They define the critical elements of situated learning environments as providing authentic contexts, activities, and assessments through design strategies, including: coaching and scaffolding (i.e., by the teacher); modeling of processes/practices; engagement with multiple perspectives/roles; collaboration for knowledge construction; and reflection and articulation (e.g., making tacit knowledge explicit) (Herrington & Oliver, 2000, pp. 25-26). Additionally, when teaching or learning about and through technologies, alignment between learning outcomes and technological affordances (i.e., the types of interaction that a technology facilitates or prevents) becomes key (Willcockson & Phelps, 2010). We have distilled and integrated all of these considerations into five pedagogical elements of Learning Design framing the development of digital literacies outlined in Figure 2.



**Figure 2: Learning Design elements supporting development of three domains of digital literacy.** We propose five key LD elements to support digital literacies in the procedural and technical, sociocultural, and cognitive domains.

Drawing upon the design literature and characteristics of situated learning, these five key LD elements can help to bolster authentic development and application of digital literacies in each of the interconnected areas of procedural and technical (e.g., technically manipulating account settings), sociocultural (e.g., creating and exchanging digital artifacts in socially/culturally relevant ways), and cognitive (e.g., metacognitive abilities for learning how to learn about and with technologies). Educators may look to this model when considering the steps involved in building digital literacy in each domain:

- 1) *Aligning technological affordances and learning outcomes.* For example, mapping disciplinary or professional competencies onto the most appropriate digital tools or technology-mediated interactions.
- 2) *Addressing learner competencies and characteristics.* For example, determining the prior knowledge and skills learners bring in each domain, and where existing competencies need to be further developed.
- 3) *Enabling learner reflection on and articulation of their knowledge and skills.* For example, supporting learners in moving from being tacit about digital knowledge and skills to being explicit about each domain.
- 4) *Facilitating collaborative knowledge construction and exchanges in (online) learning communities.* For example, where appropriate, engaging in student-student and student-educator interactions via in-person or online learning communities that help in acquiring and apply digital literacies within all the domains.
- 5) *Creating opportunities for contextual practice and scaffolding.* For example, modeling or coaching within contextual practice opportunities that reflect the domains.

These LD elements are neither prescriptive nor sequential, but rather should be seen as a part of an iterative design process. When linked to clear learning outcomes in each of the domains, they can offer a robust approach to digital literacy development.

## Conclusion

The rising interest in digital literacy, as evidenced by Google Trends search data, provides the educational technology community with a timely opportunity to facilitate a move away from stereotypical ideas of digital natives. In this paper, we argue that this move must be supported by intentional design for learning digital literacy, which fosters knowledge and skills in three interconnected domains: procedural and technical, sociocultural, and cognitive. Educators may look to the proposed conceptual framework for strategies to anchor digital practices through a model that articulates five key situated LD elements.

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