Creating a Virtual Library Classroom Tool for Digital Age Youth

Serina Patterson
University of Victoria

Abstract

This article considers the changing learning practices of today's digital youth, the Net Generation, and the use of digital technologies to create collaborative and interactive learning spaces to meet their needs. Specifically, the author details the creation of *SD62's Online Library* website, a project designed to explore the impact of e-reading on digital age youth in the classroom. Through the concepts of connectivity, interactivity, and accessibility, it is argued that *SD62's Online Library* highlights alternate approaches to online learning and provides a foundation for better integration of Web 2.0 technology into learning environments.

Serina Patterson is a PhD Candidate in the Department of English at U British Columbia. She is also associated with the Electronic Textual Cultures Lab, University of Victoria, PO Box 3070 STN CSC, Victoria, BC, Canada V8W 3W1 Email: serinap@interchange.ubc.ca .

The INKE Research Group comprises over 35 researchers (and their research assistants and postdoctoral fellows) at more than 20 universities in Canada, England, the United States, and Ireland, and across 20 partners in the public and private sectors. INKE is a large-scale, long-term, interdisciplinary project to study the future of books and reading, supported by the Social Sciences and Humanities Research Council of Canada as well as contributions from participating universities and partners, and bringing together activities associated with book history and textual scholarship; user experience studies; interface design; and prototyping of digital reading environments.

> Today's students *think and process information fundamentally differently from their predecessors*
> – Marc Prensky

Within the past ten years, the Net Generation – individuals between ages eleven and thirty – have forever changed the way we think about communication, interactivity, and our capacity to learn. Use of today's digital technology – instant messaging, blogging, iTunes, iPods, mobile phones, and social networks such as *Facebook* and *MySpace* – comes naturally to digital age youth, unlike "Digital Immigrants," who grew up with analog and broadcast technologies[1]. Over 90% of children aged five to seventeen (48 million) use computers (Lemke, 2003), and a study done in 2005 indicated that 87% of youth aged twelve to seventeen frequently go online (Montgomery, 2007). Currently, digital age youth are the most tech savvy generation; youth, as Don Tapscott (2009) writes, "just [breathe] it in" (p. 19). Indeed, today's youth live in a world of ubiquitous twitch-speed content: they can connect to peers, ideas, and information instantaneously, as well as tailor their own online spaces that promote a sense of freedom and individuality. These applications have not only reconfigured traditional concepts of information flow, but have also helped in developing new skills for traversing this digital landscape. The explosion of digital and interactive media has thus impacted how today's students acquire information, and how educational institutions are striving to meet the changing needs of their students.

While certain online learning environments, such as *Moodle,* have adopted some features of current Web 2.0 applications, numerous online classroom tools, such as *The Rembrandt Project*, have resisted the shift to the increasingly decentralized and interactive knowledge platforms that would appeal to digital age youth. Furthermore, scholars such as Marc Prensky have admirably illuminated the need to implement interactive gaming environments in teaching methodology, but there has been little research regarding the creation and implementation of new learning spaces that meets the needs of both students and educators. By analyzing the construction of a virtual library classroom tool I built entitled *SD62's Online Library*, the aim of this article is to illustrate how the changing learning practices of today's digital age youth can serve as conceptual foundations for enhancing online classroom tools.

Built in Drupal, a PHP open-source content management system, *SD62's Online Library* website is currently in its beta stage and is part of an ongoing project entitled "Teaching for the 21st Century," a study that explores the impact of e-reading on digital age youth in the classroom[2]. By focusing on concepts of connectivity, interactivity, and accessibility, I will argue that *SD62's Online Library* extends the Radical Change Theory

first theorized by Eliza Dresang and Bowie Kotrla (2009), as well as highlights alternate approaches to online learning. This virtual learning space does not eliminate the classroom, but rather acts as a facilitator to lead students and educators to different interactions with knowledge. In this way, *SD62's Online Library* can serve as an example for its integration of Web 2.0 technology in a way that alters the user experience of a traditional online e-library.

Our youth have changed

As Tapscott (2009) asserts, "the Net Generation *has* arrived" (p. 6). In order to understand the appeal of *SD62's Online Library* website design to this new generation of digital age youth, I will explain the changing characteristics, behaviours, and attitudes of digital age youth and highlight the current state of the education system with respect to teaching a twenty-first century audience.

Tweens and teens are undoubtedly the highest demographic using Web 2.0 technologies; a recent study by the Kaiser Foundation found that youth between the ages of eight and eighteen spend upwards of eight and a half hours a day exposed to digital and video sensory stimulation (Tapscott, 2009). Although research on the neurological relationship between youth and digital technology is still in its infancy, Gigi Vorgan and neuroscientist Gary Small (2008) argue that digital technology has indeed affected the physiological development of digital age youth. For Small and Vorgan (2008), the "young developing brains [of young people] are much more sensitive to environmental input than are more mature brains" (p. 25); as a result, the plasticity of young minds in response to environmental stimuli has caused youth to encode information differently than older generations (Small & Vorgan, 2008). In his work with educational games, Prensky (2001b) similarly observes that digital age youth have "develop[ed] hypertext minds. They leap around. It's as though their cognitive structures were parallel, not sequential" (p. 3). These non-sequential thinking patterns illustrate that developing brains alter their neural circuitry to better accommodate active participation within a digital environment. Youth, Small and Vorgan (2008) note, are able to process information faster, respond more quickly to visual stimuli, sharpen cognitive skills, and multitask better than older generations can (p. 20).

The changing physiological state of young brains allows digital age youth to perceive and interact with technology in unprecedented ways. While writing this paper, for instance, one might also be checking on updates for a computer game, posting a comment on a blog, browsing updates from friends on their *Facebook* page, viewing the latest Call for Papers from their *Google* RSS feed, writing an email, talking to someone on *MSN Instant Messenger*, listening to their customized radio station on *Pandora,* and watching *The History Channel* on television. For digital age youth, technology is not only immersive, but also fundamental to their quest for identity: they can use blogs, social networks, and personal webpages as sounding boards to explore ideas, issues, values, beliefs, and opinions, as well as gain a sense of shared community among their peers. Digital media has given digital age youth the autonomy and power to customize and personalize almost everything around them at a young age, perhaps more than any other generation. As media expert Kathryn Montgomery (2007) writes, youth want to "create their own personalized cultural collages" (p. 109). Far from passive observers, digital age youth also want to be active participants in digital media: as we can infer from the global popularity of top sites such as *Facebook, YouTube,*

Patterson, Serina. (2012). Creating a Virtual Library Classroom Tool for Digital Age Youth. *Scholarly and Research Communication, 3*(2): 020124, 9 pp.

3

and *Blogger*, digital age youth crave interactive and collaborative user experiences. Successful digital applications for youth must therefore address opportunities for collaboration, self-expression, community, innovation, and personalization within a visually stimulating environment.

Youth have changed, but what about our education system?

Coming from this constant exposure to a modular, connected, and ever-changing digital world, digital age youth often approach learning with an expectation for the same interactive experiences. They no longer simply want to absorb knowledge, but engage with it in a significant way (Lemke, 2003). According to Cheryl Lemke's (2003) platform for integrating twenty-first century skills into the classroom, "students learn more when they are engaged in meaningful, relevant, and intellectually stimulating work" (p. 10, 64). In the same vein, Tapscott (2009) suggests that we need to "customize the education to fit each child's individual way of learning" (p. 122), a suggestion that extends the student-centred approach to learning. Terry Anderson (2004) also notes that digital age youth need collaborative learning environments online where they can "[talk] about knowledge" and "reflect upon their own thinking" (p. 37).

While numerous educators have abandoned the traditional lecture-style approach to teaching, many teachers still do not know how to effectively integrate digital technology into the classroom in a way that balances their need to convey specific information with the interest (and attention spans) of their students. David Buckingham (2007) outlines the issue as a problem of implementation: "the problem with most educational uses of such media is that they continue to be regarded as merely instrumental means of delivering information – in effect, as neutral tools or 'teaching aids'" (p. 145). Educational sites are thus often created with the goal of the educator in mind rather than the user experience of the students.

The *Rembrandt Project* presents an excellent case study of this dilemma: as an educational website that intersects Rembrandt's artwork with social studies curriculum, Bette Schneiderman (2008) promises to deliver a user experience to teachers and students that not only showcases "a new kind of environment" for learning (p. 46), but that also teaches twenty-first century visual literacy skills (p. 44). While users can access Rembrandt's artwork on the website, students are given few opportunities to discuss and interact with the works with their teachers and peers *on the site itself,* a feature Schneiderman states is an essential part of the project (p. 47). Rather, the site provides lesson plans and suggestions for teachers to follow in their classrooms *offline.* The *Rembrandt Project*'s Web design highlights the educational problem commonly found in educational websites: in terms of their design, these stationary websites may be useful to educators, but they ultimately suffer from a misunderstanding of how digital age youth interact with content in a digital setting. Although the *Rembrandt Project* hosts a virtual building in the game *Second Life*, the site does not effectively communicate collaboration, personalization, and interaction with content in a visually stimulating manner. As a result, the site shifts students from an active role online to that of a passive observer.

From a Web design perspective, the problem lies primarily in the changing notion of interactivity between online and offline environments. Educational models such as Anderson's (2004) theory of online learning stress the importance of human-based,

and specifically teacher-student, interactivity in a learning environment, but students today also learn from content-based interaction. Interaction is no longer simply an exchange between two people, but a method of *influencing* and *changing* the content in significant ways. With the plethora of Web 2.0 applications available today, links, dropdown menus, and image galleries are, unsurprisingly, no longer a remarkable phenomenon to digital age youth. "Young Digital Natives," Small and Vorgan (2008) note, "have become stimulus junkies, drawn into flashy graphics and intense, rapidly changing visual stimuli" (p. 38); therefore, the key lies in thoughtful design and implementation of web-based applications based on the user's motivations. Design, as Martin Holmes notes, is critical to the success of an interactive application: "well conceived interactivity knows its audience, understands their knowledge base, and uses terms and phrases that are commonly understood by that audience" (quoted in Sims, 1999, para. 6).

Web design: Digital age youth versus digital immigrants

When I first set out to build *SD62's Online Library*, I knew that it had to appeal to the needs of two distinct audiences: students and educators. The main goal of *SD62's Online Library* was to create an e-library framework that allowed students to download class materials and discuss literature, and enabled teachers to create classroom groups, upload library and classroom material, and have full control over student accounts. If we glance briefly at the design of top teen-centric sites versus the top online libraries available publicly, we can clearly see the discrepancy in visual stimulation between these two demographics. On popular teen sites for girls such as *Cosmo Girl* (a teen magazine), *Girl Sense*, and *Gurl*, teens can find the latest trends in teen fashion, take personality quizzes, play games, chat with friends, personalize their profile page, customize a mini avatar, and so on. Information on these sites is vibrant and ever-changing: podcasts, videos, images, *Flash*-based applications and other interactive media used to engage teens are presented with bright colours, clean CSS templates, and trendy graphics. Although these sites may appear saturated with information, teens are able to read and navigate information with ease. From their design, digital age youth know immediately that these sites were built for *them*. Top online libraries, in contrast, do not usually contain any of these interactive elements. The *Internet Public Library*, *Literature.org*, and *The Free Library* provide great search queries and subject categories, but no way to interact with the literature. Additionally, the layout is visually minimalist with little or no colour or graphics. *Feed Books* and *Read Print* provide visually appealing CSS templates, but users can only "favourite" books. Perhaps one of the only online literature websites that combines traditional library navigation with interaction is Amazon's *Shelfari* – a virtual bookshelf where users can add and discuss books they are currently reading. Unfortunately, *Shelfari* is not a library; books must be borrowed elsewhere. From this survey of websites, we can gain a sense of the differences between sites that appeal to both digital age youth and older generations: while website designs that appeal to digital age youth are often visually stimulating, websites built for older generations have simpler navigation and are largely text-based.

SD62's Online Library

The split of preferences between these two demographics were also strongly reflected in my report for requested features carried out in the initial design stages of *SD62's Online Library*. While conceiving of its design, I asked Devon Stokes-Bennett and her students to provide a list of desired features for the site (see Table 1). Students wanted a site that not only provided

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5

an easy download system, but (unsurprisingly) also included a variety of interactive elements they typically might find on frequently visited websites such as *Facebook* and *iTunes*.

Table 1: SD62's desired website features

Features Requested by Students	Features Requested by Teachers
An easy and **comprehensive search engine** that allows students to search by author, title, subject, genre, etc.	**Easy to navigate** books and files through a **neutral** visual interface
Genre categories like *iTunes*	**Groups** and subgroups for different classes and districts
A **rating system**, but only for opinion (interestingly, students felt that a five star rating system "would be hurtful" for books their fellow peers enjoyed)	Enable interactive discussions **between teachers and students**
Images of book covers (many students requested a site that provided numerous colours and images)	Allow instructors to **monitor and modify** site content generated by students
A feature that **recommends similar books** based on the user's previous selections (they wanted something similar to the *iTunes* music recommendation system)	Only instructors can create student accounts. Students do not have the ability to change usernames
Future potential for downloading music, podcasts, and videos of books and other media	An **uploading system** that allows instructors to upload files to their classroom space (a group) and e-books to the library
A **classroom space** where students could ask questions, give help on assignments, have **group discussions** on class topics, and so on	Provide instructors with information on **site statistics** for page visits, book downloads, and popular books
A **profile** that students could add their own interests and **personalize**	
A **reading journal** (blogging system) where students could share their thoughts on literature, and provided the ability to have different privacy settings on different posts	

For instance, the students did not simply want a text-based list for their navigation system, but an "iTunes-like interface" wherein they could turn book images over to read the back jacket and preview opening chapters. In effect, students wanted to engage with texts in a system they were comfortable with: they wanted to "touch" the books, recommend them to a friend, and express their opinions about them. For students, books were no longer perceived as objects given out in class and lectured on by their teacher; rather, their desire for active participation illustrates that they are already changing the way people think about learning spaces and, in some cases, how we engage with literature itself. Teachers' requests, on the other hand, mostly focused on issues of security, classroom space, and uploading books in an intuitive process. Interactive elements played a minimal role in their desired user experience.

THE STUDENTS

Eliza Dresang and Bowie Kotrla have similarly picked up on this trend toward interactivity in books targeted at digital age youth. Coining this change as the "Radical Change Theory," Dresang and Kotrla (2009) outline three criteria – connectivity, interactivity, and accessibility – for defining technology-driven changes within young

adult literature. Since *SD62's Online Library* is, in part, a place to learn and connect with literature, I would like to extend their theory by applying it to the design and development of *SD62's Online Library*. In short, Dresang and Kotrla's theory is useful for understanding how media conforms to the sensibility of its users.

Connectivity

Dresang and Kotrla (2009) refer to the principle of connectivity as a "sense of community" within the medium created primarily through socialization (p. 94). *SD62's Online Library* provides students with multiple ways to foster this connectivity by promoting shared experiences and communication. In addition to a classroom group – that is, a mandatory group administered by their instructor where they can ask questions and download assignments – students can create and administer *their own* groups about any school-friendly subject. Students can also create a forum within their group and start discussions with members who join their group. Moreover, a public forum connects all members on the site with defined, school-related topics.

Individual reading journals and a commenting system also increase the site's sense of community by enabling students to read and post thoughts about literature. Students can comment briefly on any book or post in a reading journal. Alternatively, if students simply want to provide a quick opinion on a book, they can click on the "Vote Up" icon located on every book's main page. Top voted books are displayed on the website's front page.

Interactivity

Dresang and Kotrla's (2009) second technology-influenced principle is interactivity. For Dresang and Kotrla (2009), interactivity "refers to dynamic, user-initiated, nonlinear, non-sequential, complex cognitive, emotional, and physical behaviors" in relation to literature (p. 94). While they focus on print-based literature, Dresang and Kotrla's (2009) definition extends well beyond the tendency to define interactivity as exclusively based on human relationships. In an online classroom environment, this interaction becomes a key component for engaging students with classroom material. *SD62's Online Library* contains numerous elements that promote nonlinear navigation and personalization in relation to the site's library content. First, the website features multiple, aesthetically engaging navigation paths to find desired books. Students can browse books by interacting with a three-dimensional tag cloud, tag categories, and a coverflow interface that cycles through newly added books. Also available is a feature that provides users with a list of books similar to the book they are currently viewing. If a student wants to locate a specific book, they can use the search bar or browse through the alphabetized list of books under the "library" link; while these two features are, perhaps, the most traditional forms of navigation, books are still viewed as images in order to create a visual, virtual bookshelf.

Accessibility

Dresang and Kotrla (2009) define accessibility in terms of breaking down information barriers between people (p. 94), but for a website accessibility also includes providing information across human-interface barriers. Written in PHP, *SD62's Online Library* is available using any modern Web browser from the last decade. Features are functional across all browsers and information is laid out in a consistent manner. The site uses actual text and JavaScript instead of *Flash* so that user-system-based accessibility

Patterson, Serina. (2012). Creating a Virtual Library Classroom Tool for Digital Age Youth. *Scholarly and Research Communication, 3*(2): 020124, 9 pp.

7

clients can read or translate material for students who are seeing or hearing impaired. The site also supports high contrast colours in order to provide easy reading on different screens. In addition, *SD62's Online Library* currently hosts over two hundred novels, short stories, and poems for students to download and read. With such a wide availability, teachers can vary curricula without a high initial cost.

The teachers

If students crave interactive, visually stimulating media, then how do we implement this new type of interactive environment in a way that is also feasible for educators? Buckingham (2007) cautions that schools should be careful to curb the desire to create applications that are "more like children's out-of-school environments" in order to maintain a certain level of authority (p. 179). *SD62's Online Library* is teacher-friendly in that instructors can turn off any interactive element on the site, create a group that only allows instructors as members, and monitor student-generated content, among other things. While theorists such as Prensky (2001) suggest solutions for enhancing interactivity, such as gaming, without regard for a teacher's access to resources or curricula, virtual classroom tools must also keep in mind the needs of the teacher and the school board. Thus, security and accessibility are top priorities on *SD62's Online Library* and only teachers can create and delete student accounts. Students are not able to upload books, images, or documents to the site.

While *SD62's Online Library* is still currently in the beta stage, the site still offers teachers an innovative platform that provides creative ways of extending learning beyond classroom walls. In this way, teachers can create creative assignments, use their group page as a hub for out-of-class discussion, or use the site in a physical classroom. As students and teachers interact with the website and more features are added, *SD62's Online Library* has not only become a classroom tool for engaging students with literature, but has also progressed well beyond a simple teaching aid used only in a physical classroom. Understanding the way students perceive and interact with content can help pave the way for building educational spaces that better meet the changing educational needs of digital age youth.

Notes

1. "Digital Immigrants" are typically people who were born before 1977 (i.e., Baby Boomers and Generation X).

2. The pilot group for this project comprised two high school English classes from Victoria's school district 62.

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Patterson, Serina. (2012). Creating a Virtual Library Classroom Tool for Digital Age Youth. *Scholarly and Research Communication, 3*(2): 020124, 9 pp.

9