

# Teens, Virtual Environments and Information Literacy

by Jamshid Beheshti

## EDITOR'S SUMMARY

As digital natives, the vast majority of teens are used to cellphones, text messaging, social networking sites and other forms of electronic communications and technologies. Though rooted in the digital world for many of their daily activities, teens lack basic information literacy skills for academic tasks and other demands. Specific instruction through the educational system may not be feasible, but it may be possible to build teens' information competence through interactive virtual learning environments. Game-style virtual environments are highly motivating and engaging, providing opportunities for repeated practice and reward for persistence and achieving goals. A virtual reality library, VRLibrary, was constructed, collaboratively designed by young teens and adults, based on the metaphor of a physical library. Teens could wander the virtual space and browse links to age-appropriate websites presented as virtual books. VRLibrary was very positively received and succeeded at engaging teen users. A librarian avatar could be incorporated to provide help as needed with a user's information seeking.

## KEYWORDS

adolescents	computer assisted instruction
information and reference skills	educational technology
virtual libraries	digital natives
information literacy	

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Today, information and communication technologies (ICT) are the prevalent mode of communication among youth. Recent reports indicate that 75% of 12-17-year-olds own cellphones, and text messaging is common among 88% of them. Pew Internet Research Center's 2009 survey shows that young adults of 18-24 exchange on average 3200 messages per month, with girls ages 14-17 following not far behind with an average of about 3000 messages per month [1]. Social network sites (SNS) such as Facebook with more than 750 million active users are also an important communication tool among youth. Just over 60% of 13-17-year-olds have a personal profile on SNS [2]. Despite the age restriction imposed by SNS, evidence illustrates that more than five million children under the age of 10 are SNS users [3].

Many designers have developed attractive, vibrant and dynamic portals to provide access to information and educational materials for the so-called *digital natives* – those born after 1989 – who may process information differently from their predecessors [4]. The term *digital natives*, however, may be controversial. Many colleagues point out that they rely extensively on ICT and therefore feel that they are as plugged in and as tuned in as any teenager. The digital natives, however, do much more than text messaging; they live in the digital world. Whereas most adults are attached to their physical material artifacts, cherishing their hardcopy books and DVDs, the digital natives live in digital worlds where they own virtual artifacts, which are more than just digital music and streaming movies. They use SNS to create personal spaces to store artifacts such as currency and familial possession as a means of self-expression. In a fascinating study of teenagers, Odom, Zimmerman and Forlizzi interviewed 21 teenagers (12-17 years old) to solicit their opinions about and observe their behavior in

everyday life [5]. One 16-year-old states, “I like to be logged in to my laptop and iPad so I know when something happens, like someone writes on my wall or a photo or tags me. ...I want to see it around me. ...way better than getting a text [message] or an email about it later. ... it keeps me up to date with everything going on.” (p. 1496).

### Information Literacy

While many teens use the Internet for online shopping, downloading music and sharing their personal information and artifacts, 62% reported using the Internet for finding and retrieving news and information about current events, and 31% reported that they search for health, dieting or physical fitness information [6]. Despite their online activities, a panel of experts, meeting recently to discuss the information behavior and needs of the new generation of users, concluded that a research agenda is urgently required to investigate the “characteristics and preferences of this tech savvy group that surprisingly lacks basic skills in information evaluation and retrieval” [7]. A growing body of research shows that children and young adults when seeking information under imposed tasks such as school projects encounter many problems and challenges. In a comprehensive review of the literature, Large [8] concludes that children encounter problems in selecting appropriate search terms, move too quickly through the web pages while spending little time reading the materials, and have difficulty judging the relevance of the retrieved pages.

These challenges are just a few among scores of obstacles facing today’s teenagers, who for the most part may be information illiterate. In fact, studies show that when the youth enter institutions of higher education, they lack information seeking, retrieval and evaluation skills [9]. The American Association of School Librarians’ Standards for the 21st Century Learner [10] reflect the new realities of emerging ICT. The standards are divided into four broad competencies: 1) inquire, think critically and gain knowledge; 2) draw conclusions, make informed decisions, apply knowledge to new situations and create new knowledge; 3) share knowledge and participate ethically and productively as members of our democratic society; and 4) pursue personal and aesthetic growth. These standards along with the information literacy

standards proposed by the American Library Association and many other national organs, such as Partnership for 21st Century Skills and international organizations, form the basis of a continuum that begins with the teenagers’ ability to define a problem and identify the information need, followed by searching for information, identifying and selecting the appropriate sources and contents, authenticating the sources and the contents, retrieving and storing the information, organizing the information for future use and synthesizing the information while respecting copyrights to produce new knowledge. The process is complex and multifaceted. Each step requires advanced knowledge and skills, which should be acquired through education and training.

### Intervention

Numerous information-seeking models have been proposed, the core of which deal with information need, searcher’s characteristics, the environment and the interaction of these three entities [11]. Kuhlthau, through her observations of school students, developed a six-stage information searching process (ISP) model, designed from the user’s perspective, that incorporates the concept of time and shows that students’ conceptions of information change as they progress through the information problem [12]. She emphasizes the affective factor (feelings) and investigates the factor’s role on users as they move through various stages of the ISP. Kuhlthau suggests that uncertainty, and consequently anxiety, are experienced by the students as they move through the third stage of ISP, the exploration stage. At this stage, intervention may be necessary in order to reduce unnecessary anxiety.

Intervention in information seeking through various agents is supported by Vygotsky’s theory of the zone of proximal development (ZPD) [13]. ZPD may be considered as the bandwidth of competence within which people learn. The lower limit of the zone consists of the tasks that can be accomplished independently, while the upper limit includes more complex tasks requiring interaction with experts. Kuhlthau’s notion of the zone of intervention is modeled upon the ZPD and is defined as “that area in which an information user can do with advice and assistance what he or she cannot do alone or can do only with great difficulty” [12, p. 129]. Considering that the significant budget constraints imposed on the education system may

curtail any attempt to train teenagers in information literacy including information seeking, can we design systems that would empower young people to become self-sufficient, information literate individuals?

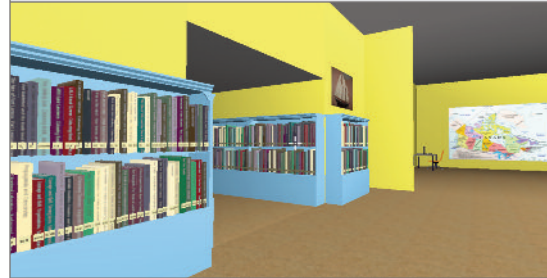
### A Potential Solution

Digital natives often are well versed in using computer games, most of which now take the form of simulations, such as those designed for the X-Box 360 and the Nintendo Wii. Computer simulations can take various technological forms, including virtual environments (VEs), which provide a computer-generated experience obtained by and through an interface that engages one or more of the user's senses and almost always includes the visual sense. VEs give a feeling of being within a three-dimensional space where the user interacts with objects and controls his/her movements. VEs can provide an interactive, stimulating learning environment (sometimes referred to as virtual learning environment or VLE).

Although the application of computer simulations in an educational context has raised some controversy, especially from those educators and developmental psychologists who have questioned the appropriateness of virtual experiences for children, a MediaWise report summarizing the findings of a number of research studies, states, "Video games are natural teachers. Children find them highly motivating; by virtue of their interactive nature, children are actively engaged with them; they provide repeated practice; and they include rewards for skillful play. These facts make it likely that video games could have large effects, some of which are intended by game designers, and some of which may not be intended." [14] Other evidence shows that immersion and presence can have a strong motivational impact on young users who like computer applications, which often produce engagement and delight in learning. Teens will benefit from VEs which present them with opportunities to experience environments normally inaccessible to them for a number of reasons such as safety, time, distance and scale.

VEs may have an important role to play in engaging teenagers in their information-seeking processes and helping them to contextualize information. The rationale for using VEs in the information context goes beyond their appeal to digital natives. VEs are especially effective in

FIGURE 1. The VRLibrary



allowing students to experience new worlds where they can develop resources for problem solving and, ultimately, view the environment as a design space that can be engaged and changed.

A focus on engagement is needed to ensure that teenagers remain in virtual environments long enough to investigate and learn the content. VEs have been used successfully in entertainment and gaming worlds with which teenagers are likely to be familiar and enjoy interacting. While many VEs such as *Second Life* and *World of Warcraft* are designed for adults, more than 250 virtual worlds have been constructed for teens. *Habbo Hotel* ([www.habbo.com](http://www.habbo.com)) founded in 2000, is an example of a thriving VE, boasting to be the "world's largest online community" for teenagers with more than 200 million registered characters.

While young people are increasingly using the Internet they are still well acquainted with traditional libraries. This familiarity with the library environment leads us to believe that the VE should represent a physical library. We utilized a bonded design methodology, where adults and young teens formed an intergenerational design team, to construct the VRLibrary (Figure 1) [15]. We used the metaphor of a physical library with rooms, bookcases and books to design and develop the VE. The user, just as in a physical library, can walk around the library, move among the bookcases, scan the titles of books that are arranged on the bookshelves, select individual books and open them. The difference is that the library and its rooms are virtual, and the books actually represent websites; when a book is "opened" it displays the contents of the website in a window. We chose the library metaphor because young people are acquainted with traditional libraries and we could capitalize on the navigational affordances of recognized artifacts. The VRLibrary contains about 1500 links to English-language websites classified and deemed to be appropriate in content and

language for students and on Canadian history. In multiple experiments, younger teens could easily navigate through the VRLibrary and select appropriate books (websites) relatively efficiently. They unanimously agreed that the VE was “cool,” and remained engaged to discover new resources by browsing through the virtual library.

Many of the participants in the experiments were also resolute about the help features or an outside intervention agent; they would have liked to receive help if and when needed. They suggested that in this VE, in-context help should be provided through an avatar depicting a librarian, who would approach the user only when help would be needed. In other words, the system should be intelligent enough to know when an intervention in an information-seeking activity is required.

### Conclusion

While technically savvy, many of today’s teenagers are most likely to be information illiterate. Under imposed tasks, such as classroom projects, teens require instructions and directions to navigate through the stages of the ISP. A potential solution is to design and develop intelligent information systems with in-context assistance capabilities. Virtual environments, by their nature, are engaging for teenagers and may provide an alternative vehicle for information delivery. Teens can control these environments and navigate through the VEs interacting with information, while the system can intervene in the appropriate stages of the process. Intervention in an engaging virtual environment may be a viable solution to the complex processes of information consumption and knowledge production facing today’s teenagers. ■

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