Engaging the Skill Set of the Millennials: Librarians, Content and Technology in the Mobile Age

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Abstract

The Millennial Generation student consumes and interacts with information in a multiplicity of ways, at any time, in any location. Where Generation X took computer skills from study to employment, Millennials have grown up with an array of devices - from games consoles to computers to smartphones to e-readers to tablets. They read, message, watch video, chat, blog, photograph and tweet, interrogating and assimilating data across diverse formats. The speed and flow of information alters expectations and provides opportunities to research, share and learn faster and more effectively. This paper reviews library science and educational literature on the Millennials in the last ten years. It outlines how Millennials have been characterized and how academic libraries have responded to their needs, with special reference to mobile services. It provides examples of the functionality and services that currently typify university library apps and mobile-optimized sites in the UK and USA. The generational lens, it concludes, provides a useful perspective on key developments in academic libraries in recent times.

Keywords: Millennial Generation, digital native, digital immigrant, smartphone, tablet, Virtual Learning Environment, QR Code

CHARACTERISING THE MILLENNIALS
Defining a Generation

The Millennials, most often defined as the generation born between the early 1980s and early 2000s,

have been characterised in education and library science literature as a highly-skilled demographic cohort that presents special challenges to their Baby Boomer and Generation X educators. The term "Millennial" is first thought to have been raised in a US online poll (ABC News 1997). Generational theorists Howe and Strauss (2000) offer more comprehensive analysis of a new cohort with different values to the preceding Generation X. They point to key world events that have shaped attitudes - from the fall of the Berlin Wall to the war in Kosovo, through the Columbine shootings, the death of Princess Diana and Clinton's impeachment - events that encompass tragedy or injustice leading to accountability or positive outcomes. The Millennials are a departure from Generation X whose attitudes were shaped by news stories with more sombre outcomes, from the Chernobyl nuclear accident, to the Challenger space shuttle explosion, to the killing of protesters in Tiananmen Square.

Millennial Characteristics

Millennials are widely characterized as confident (Howe and Strauss, 2000) and optimistic (Mitchell, 2003). Born into an age of relative economic prosperity in the West, but with housing and education costs on the increase, they postpone departure from the family home (Koss-Feder 1998), often meaning that they have greater disposable income for cars, clothes and technology. Wolburg and Pokrywczynski (2001) note Millennials are more likely than their Baby Boomer parents to stay single in their 20s and 30s. Their parents, in turn, are more involved in the lives of their children, including college-age children, and "they believe the interference works" (Kennedy 2009).

Library scientists have contributed to the characterizations with a view to understanding the needs of a new cohort of customers. Abram and Luther (2004) describe Millennials as format-agnostic, nomadic, multi-tasking, experiential, collaborative, integrated, principled, adaptive and direct. Working with focus groups, Sweeney (2005) finds them discerning consumers who value education and work-life balance, are achievement-oriented and confident of their prospects.

Probably their most defining characteristic is their skill with digital technology. Prensky (2001) describes them as "digital natives", native speakers of the language of computers, video games and the internet. He compares them to the "digital immigrants" of the prior generation that have adapted to new technology but tend to revert to old habits of learning and discovery. He estimates that in the US, the average college graduate of the moment has spent less than 5,000 hours of his or her life reading, but more than 10,000 playing video games. This is a generation that assimilates information quickly, functions better when networked, multi-tasks, prefers graphics over text and random, hyperlinked access over linear presentation of content. Prensky concludes *"...today's students think and process information fundamentally differently from their predecessors"*

Surveying US secondary and tertiary level students in 2003, Microsoft's Diana Oblinger notes Millennials are fascinated and persuaded by technology, tending to be uninspired by the technological skills of their educators (Oblinger 2003). At university level, some 79% of those surveyed believe the impact of the internet on student life to be a positive one, whilst 60% believe it to have improved relationships with colleagues and 56% with professors. Some 70% of teens use instant messaging to keep in touch, with 81% using email. The telephone has already given way to the internet as a preferred means of communication (Oblinger 2003). Sweeney (2005) picks up the theme, noting the immediacy of online services and gaming tend to make Millennials impatient, even by their own reckoning.

Other studies point to contradictions in Millennial behaviour, notably that high technical engagement can be accompanied by a willingness to accept "good enough" information drawn from a limited range of sources. Laureen Cantwell, Reference and Distance Services Librarian at Colorado Mesa University recently told the Library Journal "I see a lot of what's known

as satisficing…" meaning they feel satisfied with their research when a sufficient answer is reached. "….They go with what they can find as opposed to sleuthing out what they need - they're not employing all their options…" (Peet 2014). Some go further in depicting the "digital natives" as hindered. Online provision of learning resources can set inexperienced students adrift from the support of their teachers and give them leeway to "behave rashly, make poor judgments and cut corners…" (Brabazon 2007).

Millennials and the University Library
Self-Servicing and Confident Information Seekers

Millennial characterizations, in turn, have spawned multiple studies on how this generation seeks information from the university library and how librarians should respond. Holliday and Li (2004) note the Millennial preference for launching enquiries from commercial search engines and frustration at traditional advanced searching. Millennials are confident, and to a large extent effective, in selecting high-quality web resources, they are versatile consumers who can "switch instantly between commercial search engines, social networking sites, wikis, bookmarked resources and electronic services provided by their library to satisfy their information needs". Connaway (2008) says catalogues must be made easier to use and a range of methods and access preferences must be accommodated.

In a doctoral study focused on four UK higher education institutions Tapril (2011) finds most students owning PCs and spending 25-36 hours online per week for academic and personal use. They are frustrated with lectures and other mass instruction formats and seek customizable, convenient library services. Library staff primarily are seen as a source of procedural or directional support over reference or specialist subject support, with content acquisition increasingly patron-driven. At the heart of student expectations is a sense that libraries should deliver to self-empower.

Changing Role for Librarians

University librarians, in consequence, note a decline in demand for traditional reference work and an expanding role as customer-centred educators. In the Tapril study, librarians cite learner support and customer service displacing traditional forms of specialist subject input. They are focused on providing information literacy tuition, creating and maintaining electronic resources, delivering quality learning spaces, metadata development, licensing digital material, collecting and digitizing archival material (Campbell, 2006).

The rise of the Virtual Learning Environment (VLE) for university teaching presents further opportunity for librarians to engage with the Millennial skill set, whether by embedding basic OPAC services in the VLE or using it as a vehicle for learning support. However, access issues and organisational culture at times limit librarian involvement with VLEs (Corrall and Keates, 2011). There is also recent anecdotal evidence that librarians are reluctant to place full-text articles within the VLE as they cannot generate usage data from that environment. They prefer, therefore, to insert deep links from the VLE back to the hosting site.

Librarians are nonetheless seen embracing their directional, para-academic role in many ways that suit Millennial learning styles. Just one example is reported by Sachs, Leatherman and Langan (2010) who describe re-creating the University of Western Michigan's online tutorial on information literacy after surveying student requirements. The new tutorial understands contemporary learning preferences for less lecture time and less text. The team designs a dynamic audio, visual and kinaesthetic experience that includes active and on-demand learning and task-based assignments. It is more appealing to students because it increases interactivity and shortens time to completion.

Mobile-Optimized Library Services

Just as Millennial digital technology skills are changing the nature of student-librarian interaction, high take-up of portable computing is altering the delivery of library services.

The migration to portable and mobile in fact, as Hahn (2008) puts it, has been progressing unintentionally since the 1990s when students began to grasp the benefit of smaller, faster computing leaving educators to play catch-up. Catch-up was required. The digital library was conceived for PC use; adapting web presence for smaller screen, small keyboard mobile devices requires content and technology choices. What content is essential, what content translates to mobile and how can presentation be simplified? Will native apps be more appropriate than a website customised for mobile?

Hahn cites examples of progress at US academic libraries, such as Athabasca University selecting the AirPac interface to make its catalogue searchable on mobile devices, or North Carolina State University launching its MobiLib to include catalogue search, computer availability and the campus directory.

In 2009, Ryerson University in Toronto asks students what they want from their mobile library site. Requests include catalogue search, article search, the ability to check a borrower record, book a room and display an individual student's timetable. They reconfigure the site and in the ensuring ten months, record 3,726 unique users and 10,000 visits to the timetable section (Wilson, 2010).

Little (2011) reports on the increasing use of text messaging for reference services. While early adopters purchased dedicated cell phones, a second wave of US institutions including Cal Tech, Dartmouth College and Florida Atlantic University is offering text messaging through third parties such as Mosio's "Text a Librarian" which can be integrated with existing Instant Messaging reference services and workflows.

The US Association of Research Libraries (ARL) reports that by 2010, 58 libraries (47% of its members) are offering mobile-optimized sites or apps (Gerrity and Bruxvoort 2010). The most commonly offered services are listed in Table 1.

Table 1 –Association of Research Libraries – Mobile Services Offered by 58 Libraries in 2010

Information or Service	Number of Libraries Offering Service on Mobile
Library Opening Hours	26
Ask a Librarian/Chat	27
Search	25
News	20
Locations	18
Databases	18

University-wide mobile sites or apps, often incorporating the library mobile service, are also starting to proliferate with 41 universities (33% of ARL's members) offering this facility (Gerrity and Bruxvoort 2010). An illustration of the services and functionality typical of current USA and UK academic library mobile sites is provided in the section below.

The literature also charts library initiatives with Quick Response (QR) codes, readable by smartphone cameras, that send users to websites, images, videos or other content type, or dial telephone numbers. QR codes can be positioned in library stacks to link users to online versions of print materials. They can appear on library exhibitions to link related audio-visual items and within the catalogue to offer basic information about an item and its location. They are added to printed library information sheets or marketing collateral to facilitate fast loading of the library mobile site or the text message reference service (Ashford 2010). The University of Gloucester (EDUCASE, 2009) adds a QR code to library books with the renewal number encoded.

To meet Millennial expectations of convenience and portability, several universities experiment with e-reader loan. The National University of Ireland Maynooth, for instance, uploads core text books to Kindles, finding 32 of 34 students in the trial say they would borrow the Kindle

again (Saults 2012). The University of Manchester uploads book chapters and journal articles to Sony e-readers. Students appreciate the usefulness of the e-reader as a portable storage device, though comment that it lacks the touch screen interactivity that so facilitates study. The natural progression is towards tablet loan, a current example being the University of Vanderbilt making 60 iPads available to students, faculty and staff for 3-day borrowing periods (http://www.library. vanderbilt.edu/technology/). Librarians can upload not only set texts but a wide range of apps that support study and research across the subject areas.

Alongside many studies charting the creative and proactive development of services for the Millennial generation, some commentators feel universities have not always responded quickly enough to the rapid adoption of smartphones and mobile technologies in the developed and developing world, thereby "....frustrating students who want to manage their coursework and the rest of their lives with their mobile phones."(Keller 2009). Other players, however, contribute momentum. Scholarly publishers such as Wiley, Elsevier and Springer offer apps for particular journals or databases. Journal and catalogue aggregators such as JSTOR and WorldCat roll out mobile-optimized sites. Librarians have a new task in telling users which titles and databases are mobile-optimized and explaining any login requirements on or off campus. Publishers innovate with enhanced formats for reading scholarly articles on mobile devices, such as Wiley's Anywhere Article. http://olabout.wiley.com/WileyCDA/Section/id-819787.html

Mobile Academic Library Services

University library mobile websites and apps have been rolled out widely in the UK and USA. The 12 examples below give an indication of the kind of services and functionality currently on offer.

UK

University of Cambridge

LibrarySearch (http://www.lib.cam.ac.uk/mob) is the mobile optimized interface for catalogue search accessible by link or QR code. Users can create and manage requests, renew items and build lists of items which can be emailed out. There are also interfaces for Facebook and iGoogle.

University of Exeter

The library is using the smartphone catalogue interface AirPac for mobile access to the catalogue, journal article search and requests (see Figure 1). User accounts, payments and inter-library loan are also mobile-optimized. http://as.exeter.ac.uk/library/resources/airpac-mobilecatalogue/

Figure 1 – University of Exeter Library App

University of Glasgow

The library app offers AirPac quick search, journals search and library user account management. There is also a Find Exam Papers function, PC availability check, email a librarian and library news on Twitter.

http://www.gla.ac.uk/services/library/mobile/

Loughborough University

The library's own Systems Team designed the app and continues to develop it. Users can check borrowing details, renew, cancel high demand books, browse reading lists, make room bookings, check PC and read up on events and library news.

http://www.lboro.ac.uk/services/library/about/projects/mobile/

Newcastle University

The mobile site at http://libsearch.ncl.ac.uk searches the full library collection and links to online resources. There is also a mobile question and answer system at http:// libhelp.ncl.ac.uk/mobile.php where users can raise a question, book a librarian consultation or enter live chat (see Figure 2).

Figure 2 – Newcastle University's Library Help for Mobile
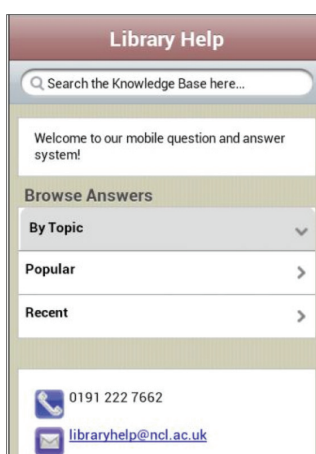
University of Reading

The library is using an "off-the-shelf" library app (BookMyne developed by SirsiDynix) to provide its mobile services. It's free to download but users have to select the University of Reading as their home institution and set up an account with their university login. They can search, create personalised lists, check loans and due dates. However, it will not display recall due dates.

http://www.reading.ac.uk/library/using/catalogues/lib-bookmyne.aspx

USA

University of Arizona

In addition to the ability to search the catalogue, chat, ask questions, check opening hours, the library app offers a mobile optimized version of the full library website. The university librarians have produced a comprehensive guide to publisher and other databases that are mobile optimized.

http://www.library.arizona.edu/help/how-do-i/mobile#databases

California State University Marcos

In addition to having a mobile site at http://mlib.cususm.edu that offers search, renew, help and group study facilities, the library has launched an app specifically to help people inside the library find a free computer and save time waiting for people to log off.

https://biblio.csusm.edu/site/computer-app

Duke University

Duke University library offers an extended list of services that launch from the university-wide app. In addition to search, request, renew, user account view, users can view mobile-optimized research and course support guides, ask a librarian and chat.

https://itunes.apple.com/gb/app/dukemobile/id306796270?mt=8

Harvard University

Harvard has created a university-wide app to meet the multiple requirements to the Harvard community. The simple, clean interface (see Figure 3) links to a catalogue search across all Harvard's libraries and there are maps to show where each library is located. Users can check availability of items.

https://itunes.apple.com/us/app/harvard-mobile/id389199460

Figure 3 - Harvard University Mobile App
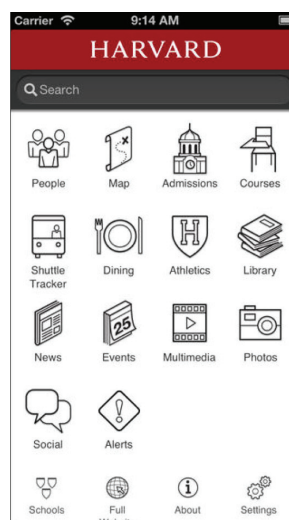
Massachusetts Institute of Technology (MIT)

MIT has created the MIT WorldCat mobile from which users can search and request books from MIT libraries and from libraries around the world. It accesses the main MIT catalogue to renew books. Users need to connect to the MIT mobile web site to find library hours and contact staff at MIT Libraries.

http://libguides.mit.edu/c.php?g=176092&p=1158704

https://itunes.apple.com/gb/app/mit-mobile/id353590319?mt=8

San Diego State University

The library app includes standard search, user account information, request and renew services in both English and Spanish interfaces. The app incorporates detailed floor plans (see Figure 4).

https://itunes.apple.com/us/app/sdsu-library/id529283501?ls=1&mt=8

Figure 4 - Library Floor Plan View from San Diego State University Library App

The Generational Perspective

A recent survey of 1,228 US college students aged between 18 and 30 (Harris Poll & Pearson 2014) finds 83% regularly use smartphones for study, 86% regularly use laptops and 45% regularly use tablets. Some 96% have wireless internet at home. In the UK, the University of Leeds has recorded a 300% increase in unique users of wireless devices since 2009 (Caperon 2014). The Millennials are living up to their tech-savvy characterization while manifestly seeing technology not so much as technology, but simply the norm.

The generational lens is just one of several prisms through which we can interpret today's students. It is a useful prism, nonetheless, for putting recent developments in university library services in perspective. The roll-out of mobile-optimized and other technology solutions, and the shift in the librarian's role itself, show a profession responding to very generational expectations for anywhere anytime connectivity, engagement, interaction and service.

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