The Google Generation is at Your Library's Door

How (Information) Literate are Today's College Students?

Introduction

Today's college students are mavens with mobile devices and everyday technology. The first generation of true digital natives is a cohort who show adaptability with technology – no matter how new or complicated. It is this adaptability which creates an impression that this generation of today's college students has a superior user experience expectation (UX). But being well versed in technology and UX does not make a well-versed researcher. In fact, it is quite the opposite. Technology, especially the Internet has built poor information literacy skills in today's students. The Google Generation, for example, may not fully understand the different types of information resources and distinguish 'good' from 'bad'. As a result, there is a significant gap in what information skills a student graduates with and what is expected within the workplace, ultimately affecting their careers while de-valuing the monetary worth of their college experience.

Libraries are faced with an incredible challenge to teach, build and ensure information literacy skills within today's college students – no matter their research level. This whitepaper will explore this challenge as well as present the idea of how discovery platforms can be utilized as a first step in building information literacy in students.

Today's College Students - Meet the Google Generation

The Google Generation is on trend to be the most educated generation of all time, with college enrollment surpassing that of Millennials. [1] Your college or university library will be a place they most certainly will utilize. Understanding who they are and how their lives have been shaped provides key insight into what motivates them, how they utilize technology, their user experience expectations and the research challenges your library can meet.

As children of Generation X, the Google Generation's views and perceptions have been shaped by their parents. Gen Xers experienced a booming job market that sharply declined, drastic changes in the housing market, large political swings and other polarizing events. Their perception has been labeled by some as "cynical", or, to put it in a more appealing way—"a new sensibility". [2] As a result, their children have been instilled with a pragmatic sense, and the notion that hard work equals success. The Google Generation was raised during a time where political tension, violence, and social instability increased. This has shaped the generation to be innovative, entrepreneurial, and highly conscious of their futures and the challenges they face. [3]

Born between 1996 and 2012, the Google Generation has interacted with technology from a very young age. [4] Digital tools and platforms like the Internet, mobile devices, computers, and social media have and continue to be a constant and prevalent force in their lives. It is these tools and platforms which have shaped their "information processing" – not only are these "Digital Natives" able to process information at a substantial rate, they are often multitasking while doing this. [5]

Technology has shaped the way these students process information but has also shaped their user experience expectations and communication methods.

Mobile

Unlike previous generations (including Millennials). The Google Generation has always known a life in which mobile devices have been present. For all of us – mobile has become our go-to device, but for the Google Generation, mobile is ingrained in their lives (preference isn't even an option). The average age the Google Generation received their first phone is age 12, and the Smartphone is their preferred device. [6] It is the impact of mobile through the formative years that has influenced a portion of the user experience expectation of this generation. From shopping to communication to video usage to learning – mobile reigns supreme. According to a 2015 Pearson Education Survey, 75% of high school students believe using mobile in the classroom will better match their learning style. [7]

As a library, the mobile-first mindset will certainly affect the research behavior of your college students. Ensuring that there is a mobile-first approach to your library website and discovery platforms will ensure that your library is matching the UX expectation of your end-users. In addition, mobile and "anytime" access of your library will be critical for students who are pursuing a degree remotely – which is on the rise in the United States. [8]

Internet Influence

As with mobile, the same life-long influence has occurred with the Internet. For the Google Generation, the Internet has become the primary means of obtaining information and learning. [9]

On a positive note; the Internet has shaped students' perceptions that learning can take place anytime, anywhere, they believe that learning tools should be available on-demand and have low barriers to access. [10] Internet search results and evaluating search results have created interesting UX behaviors in students. The starting point for an Internet search is most often Google, even if this is not the best place to start. This overreliance of Google has affected their ability to properly interact and assess search results and has also poorly affected their user experience behavior when searching for information. For example, students will take a "tabbed" approach –

opening several Internet browsers at a time to access and assess information. [11] They also have a short "bounce" approach, viewing only 1-2 pages of a website before bouncing. In terms of evaluating search results - most take a "failure of acceptance" approach, meaning that you accept what you find quickly from web-based search results and not what is best. And most often the top evaluation criteria for assessing search results is the currency of the article, rather than relevancy to their keyword search.

Social Media

It is well understood that this generation is a big consumer of Social Media, but there are key differences in how the Google Generation uses and interacts with social media that provide clues into their consumption of research content. Whereas previous generations used social media to primarily connect with others, the Google Generation uses social media for information sharing, education, searching for information and entertainment. [12] For example, today's students are more likely to turn to YouTube for education and product research – more so than any other generation. [13] In fact, according to a Pew Research Center Report, YouTube is the dominant social media platform for U.S. teens. [14]

In understanding mobile usage, Internet influence, and social media behavior, connections can start to be made with how this generation researches and how growing up in the golden age of technology has created a generation of information "illiterate" students.

Information Literacy Defined

In order to understand how the Google Generation lacks information literacy, we must examine and understand the tenets of information literacy. The phrase "information literacy" was coined by Paul Zurkowski, president of the Information Industry Association, in 1974. [15]

"Information is not knowledge; it is concepts or ideas which enter a person's field of perception, are evaluated and assimilated reinforcing or changing the individual's concept of reality and/or ability to act. As beauty is in the eye of the beholder, so information is in the mind of the user."

While today's college students can acquire knowledge, it is how they interact and "act" with information which is the challenge that your library must address.

The ALA defines information literacy as a five-step framework [16] :

1. determines the nature and extent of the information needed
2. accesses needed information effectively and efficiently
3. evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system
4. individually or as a member of a group, uses information effectively to accomplish a specific purpose
5. understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally

The AAC&U also defines information literacy via a 5-quadrant rubric [17] :

1. determine the extent of information needed
2. access the needed information
3. evaluate the information and it sources carefully
4. use information effectively to accomplish a specific purpose

5. access and use information ethically and legally

What this is showing is that both the library (ALA) and faculty (AAC&U) value and vision information literacy with a similar approach. But, information literacy is as much an academic endeavor as it is a monetary endeavor. With higher education costs continuing to inflate, the research success of a college student is not just linked to their academic output but also with the monetary value of their academic experience. The emphasis of its monetary worth is seen more plainly once a student has entered the workforce.

The National Association of Colleges & Employers (NACE) surveyed US employers to determine how the employers valued ten skills that they wanted undergraduates to know. Managers rated the top five skills [18] :

1. "ability to work in a team structure"

2. "ability to make decisions and solve problems"

3. "verbally communicate with persons inside and outside the organization"

4. "ability to plan and prioritize work"

5. "obtaining and processing information"

While the fifth skill is a direct link to information literacy, all five skills are developed through information literacy skills. Furthering this insight, Project Information Literacy surveyed managers as it relates to new hires. Managers identified four competencies that new hires lack. [19]

1. "engaging team members in the research process"

2. "retrieving information from a variety of formats"

3. "finding patterns and making connections"

4. "taking a deep dive into the information reservoir"

Not only is an individual's GPA affected, but their career and professional life can be affected as well if a strong foundation in information literacy is not built within their academic years.

Library Challenges

If you are a librarian reading this, you are very aware of information literacy. After all, this was an area of focus during your degree studies and is also the challenge you are faced with every day. Teaching information literacy is one thing, having the right tools in place to anticipate user intent to help foster information literacy is another thing.

Impressions of the Library

Chances are, when it comes to library onboarding with the student population, you have very limited time and reach to effectively and efficiently demonstrate and present on all that the library offers. According to a recent Library Journal article, librarians, on average have about a couple of hours set aside by their institutions for a tour and presentation of the library. [20]

An inadequate amount of education time, coupled with lacking information literacy can cause unfavorable impressions of the library, particularly with first-year students – where the success rate is the most important. Impressions of your library also directly affect your ability to demonstrate the value of your library. It is a huge challenge to convince your library end users that Google is not the place to start, continue and end with research.

Limited Staffing

Another common challenge for the library is insufficient staffing. This leads many academic library staff members to juggle multiple roles and wear multiple hats – from learning code for their website, serving as the marketing and promotions department, and providing training on resources and platforms (on top of doing their job-specific duties). Limited staffing can affect not only the users of the library but also the tools and content of the library.

Inadequate Search Technology

Most students are accustomed to starting their search (both as a consumer and as a researcher) through a single-search box, after all, today's students are the Google Generation. Over the years, search technology has expanded to better anticipate users' needs, and library search technology must match. This library search technology is often packaged within a discovery service.

Utilization of a discovery platform during the research process can contribute to building information literacy skills. The functionality of a discovery platform such as *EBSCO Discovery Service™*, not only meets the UX expectations of a college student but also helps to improve their information literacy.

Overview of *EBSCO Discovery Service*

EBSCO Discovery Service (EDS) is an all-inclusive search solution. The platform offers features and functionality that improves the research experience.

Subject Indexing

Nearly every area of study has some kind of authoritative subject index. For example, psychology has *PsycINFO®*, engineering has *Inspec®*, nursing has *CINAHL®* and mathematics has *MathSciNet®*. In essence, subject indexes are high-quality mini-discovery services for their disciplines. *EBSCO Discovery Service* is the only discovery service that properly leverages subject indexes. Subject indexes contain highly detailed thesauri and controlled vocabularies. EDS leverages and connects these to provide better matches at the top of the search results list.

Relevance Priorities

EBSCO Discovery Service has no bias toward content from any provider. Search results are prioritized by:

1. Match on subject headings from controlled vocabularies
2. Match on article titles
3. Match on author keywords
4. Match on keywords within abstracts
5. Match on keywords within the full text

Value Priorities

• **Recency/currency** - Recently published content is scored higher for value than older content.

• **Document type** - Certain document types are weighted higher than others. For example, "review articles" are considered valuable. "Book reviews" are not considered valuable. If the word "book" or "review" is not searched, there is a bias against book reviews, so these don't dominate results.

• **Document length** - Documents of a more substantial length are more valuable. For example, a quarter-page article is considered less valuable than a four-page research paper.

Subject Mapping in Action

Subject indexes contain controlled vocabularies, which link concepts with different terminology. EDS includes complex mapping technology to leverage and connect these for improved search results.

For example, a search for "learning aids" maps to:

- Instructional materials (*ERIC®*, *MLA International Bibliography*)
- Educational resources (*GeoRef*)
- Instructional media (*PsycINFO*)
- Teaching aids & devices (*Education Abstracts™ (H.W. Wilson) Education Source™*)
- Teaching materials (*MeSH/MEDLINE®/PubMed*, *CINAHL*)

Users may revert to original search terms only, but user research shows that users prefer their search results fine-tuned by subject mapping.

Access to Full Text

EBSCO Discovery Service provides users with direct access to full text when available through the library (link resolvers are used when needed).

By leveraging EBSCO's SmartLinking technologies, EDS provides users with one-click access to PDF or HTML full-text content directly through the detailed record or from the result list preview pane.

Features and Functionality

With *EBSCO Discovery Service*, researchers can conduct a discovery search of their library's entire collection on a single, powerful search platform—including databases, special collections, e-books, catalog records, archives and a wide range of digital content available through their library. *EBSCO Discovery Service* offers unique features and tools built on user research to enhance the academic experience. These EDS features assist academic researchers at any level—from the first-year to graduate-level researchers.

The next section of this paper explores how a discovery service like *EBSCO Discovery Service* can meet individual researcher needs – from "beginners" or first-year students to core library users or "intermediate" students to advanced researchers (graduate-level professional students).

First-Year Researchers

The majority of first-year students are overwhelmed by the size and complexity of the college library versus their high school library. Over half (57%) felt stymied by the thicket of irrelevant results their online searches usually returned. (74%) said they struggled with selecting keywords and formulating efficient search queries. [21] For the library administrator, the 2017 Library Journal survey reported that respondents noted in their opinion, only 28% of first-year students are prepared for college-level research. As an entity that is directly related to GPA and year to year retention, this puts a heavy burden on you and your staff. For without these essential skills, first-year students will access your library without a solid foundation of how, what and where they need to find the right information for their research and will continue to have a negative association with the library.

A discovery platform like EDS provides features that match many of the research pain points of first-year students. It is through interacting with these features which will ultimately increase the return rate of first-year students to the library and help to guide students through the early stages of information literacy. Below are three examples of these features.

Anticipating user intent – autocomplete and autocorrect

When entering a search term into the discovery search box, simple mistakes such as misspelling, lack of contextual knowledge or formulating the best search queries may set the first-year research onto a rocky start. Feature elements like Did-You-Mean, Autocomplete and Autocorrect offer users suggestions and correct users' search terms, decreasing false results and errors – which can create even more confusion for first-year students.

Giving a simpler starting point for research – Research Starters

Feeling overwhelmed by search results can lead a first-year student to abandon their search early into the research process. Placards are a great feature to help guide a user to exactly the type of content they are looking for. EDS offers a custom placard called Research Starters. Designed to enhance the research experience, Research Starters include links to relevant articles, images, videos, and audio clips. The content is curated from a variety of high-quality sources including Salem Press and Encyclopædia Britannica. If a Research Starter is available for the topic, it will appear at the top of the EDS search results list.

Research Starters provides that important initial success of finding quality information on a topic without the depth of experience in researching [that] our beginning students are just building. It is an excellent transition from the more familiar Google-type of search to a more structured research strategy.

- BethMarie Gooding, Associate Dean of Library Rasmussen College

Refining Search Results – Filters and Limiters

Overwhelming search results can cause a first-year student to immediately return to a more familiar space (Google). [22] The limiters and filters that are available within EDS mimic the same UI that students are accustomed to on popular shopping sites like amazon.com. By presenting an "open tray" approach to the most common limiting elements such as Full Text, publication date range, and source type – EDS helps first-year students to start evaluating criteria within a guided structure. But, it doesn't end just with first-year students. The limiters and filters within EDS evolve alongside the researcher, so the more familiar they become with the various sources of content, the easier it is for them to drill down using the limiter and filter feature (e.g., search by subject, publication name, even publisher).

Intermediate or "Core" Researchers

For this paper, intermediate researchers are typically students who have been in school for more than one year and may have a specific area of study. They have made it past the first-year researcher struggles, but now, have a new set of challenges when it comes to developing information literacy skills. Sourcing and using ethical information, engaging other students in the research process and finding patterns/connections are just a few examples.

Connecting to subject-specific information – Hyperlinked Databases

Subject-specific databases become more of a focus for intermediate researchers but efficiently connecting to them through a simple database list may be a challenge. For example, a nursing student may not be aware that they have used information provided by *CINHAL* before or that *CINHAL* is a choice database for their area of study. This is where a feature like hyperlinked databases comes into play. This feature allows the researcher to become exposed to the availability of specialized databases held by the library, helps them to start drawing better connections and makes them keenly aware that the library has the right content for their area (more so than the Internet).

Collaboration – Google Drive Integration

A significant amount of public education students, approximately more than 30 million children, use Google education apps [23] and almost a billion-people world-wide use Google Drive. [24] Clearly, what this is showing is that Google Drive is not only the favorite (and most importantly free) cloud storage device available, but it will also most likely follow a student from high school to college and into the workplace. By having Google Drive as an integrated feature within a discovery platform like EDS, this not only satisfies the expected and established workflow of students but also provides a common and easy place for students to collaborate when it comes to team-based research.

Collecting information ethically – Citation Search

A basic information literacy skill is the collection of information and the reconstruction of that information for a researcher's output. [25] Performing this action in an ethical way to avoid plagiarism is something that intermediate researchers need to fully understand and build into their research actions. EDS provides the ability for a researcher to search on a citation – allowing the user to move forward and backward in their research and find cited works easily to avoid plagiarism. In addition, the export citations feature allows users to save or email citations in .csv or other formats of their choice, so they can easily organize and cite their research sources.

Advanced Researchers

Graduate-level researchers are at a level in their academic career where they are looked at to be the creators of knowledge, rather than the consumers of knowledge. Therefore, the expectation of their research workflow is to be self-led. [26] That may be true for many graduate students, but some may need to be refreshed in the ways of proper research and information literacy. In addition, graduate students today are pursuing their degree in different ways - either full-time or partially or completely online, this means that ease of use when it comes to searching the library is paramount to the end-users. And finally, graduate students have a very specific "field" vision for their research with a need to be able to quickly with subject-specific content.

Making Quick Connections – Full Text Finder and Journal Placards

Internal surveys conducted by the EBSCO user research team show the preferred content item for graduate students is journal articles, particularly PDF files of full-text articles. [27] Utilizing a discovery platform as an article discovery tool helps to address this need for graduate students. EDS helps to take it a step further by offering a full-text limiter for students to narrow results to full text. On the back-end, Full Text Finder, a component of EDS provides a higher standard for library holdings and link management. Robust features – including a knowledge base, holdings management tools, a state-of-the-art publication search service, as well as a fully functional link resolver – helps users find the full text as easily as possible.

In addition, EDS provides a journal placard feature. This allows a more advanced graduate student to quickly target their article search to the full text within a single title.

What impressed us about EDS was the speed with which [new] content arrived [...] Our researchers are looking for up-to-date information. They want to know that the most recent articles are available.

- BethMarie Gooding, Associate Dean of Library Rasmussen College

Be Where your Graduate Students are - Mobile

Today, researching is not just limited to a desktop. Students are using mobile devices in all areas of the research process. [28] The library must have the means to be wherever the graduate researcher is. In addition, more programs are being offered online which means that a graduate student may never set foot into the physical library space. Having an effective library experience transcends both the location of your student and the device they are on.

Create a Unique Research Experience - Subject Indexes & Subject Specific Profiles

When it comes to a high-quality search experience at the graduate level, there is no substitute for the information provided by critical subject indexes. The quality level of a record within highly-regarded subject indexes—such as *CINAHL*, *Historical Abstracts™*, *Criminal Justice Abstracts*, *Humanities International Index™*, *Anthropological Index Online*, *Art Abstracts™ (H.W. Wilson)*, etc.—is extremely important to graduate research, *EBSCO Discovery Service* leverages the power and value of detailed subject indexing from such resources (to which the institution subscribes) via inclusion of subject indexes in order to improve the quality of research for users at the graduate level.

In addition, a library can create subject-specific profile pages within EDS. For example, a university with a music department can build a music-specific search page using different branding, skinning, widget and custom options than the main library search page. This tailoring helps to better target researchers that are conducting searches granularly at the subject level, including graduate-level research.

Conclusion

The functionality of a discovery platform such as *EBSCO Discovery Service*, not only meets the UX expectations of today's Google Generation but also meets the expectations of "information literacy".

1. EDS Offers the ability for a library to streamline access to scholarly content and resources through a familiar single search experience, allowing the student to accurately access and determine the nature and extent of information being presented.

2. Relevancy ranking within EDS allows for the most relevant article or content to surface at the top of search results based off the student's keyword search. This combined with the limiter functionality allows the student to focus on effectively evaluating resources and to make selections of resources to include into his/her knowledge base.

3. With vetted information from reliable publishers and databases who have partnered with the *EBSCO Discovery Service*, the student can then take the actionable knowledge acquired through the discovery search and apply it to their work or to "accomplish a specific purpose". Additionally, the information found within *EBSCO Discovery Service* allows for a student to connect the ethical to the searching for, downloading of, and proper citation of information (something which cannot be guaranteed with a web search).

The features, functionality, and content found within a discovery platform streamline research for users and build their information literacy skills so that they can feel more comfortable researching effectively and utilizing the library resources again and again. For example, the EDS customers reported:

• University of St. Gallen (HSG) saw a 50% increase in full-text article downloads year over year post-EDS implementation.

• Namseoul University saw a 20% increase in usage of their electronic resources.

• University and City Library of Cologne noted that the number of searches in the library's subject databases increased by almost 300 percent post-EDS implementation.

Implementing a discovery platform builds information literacy skills by presenting an intuitive interface that matches UX expectations of today's college students while simultaneously employing features and functionality that guide a student to select, evaluate and implement relevant and reliable information in an ethical manner in their research.

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