OPENING THE WAY: Using Evidence-Based Practice to Address Student Information Needs

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BACKGROUND
Within our role as librarians, it is possible to see how student behavior changes over time; we might not be able to pinpoint when students altered their assumptions surrounding research, but we can observe it in our instructional sessions and in our one-on-one work with students. Identifying and responding to changes in student behavior allows us to refine our instruction and build upon the research practices students bring into the classroom. Without data to confirm, our observations can remain questionable: are we seeing a pattern or are we just remembering what we find interesting? Evidence-based practice provides us with a process for integrating evidence into our decision-making process and gives us an opportunity to check if our observations hold up under scrutiny. In undertaking this study, we hoped to gather data that would identify if the information assumptions of Generation Z students differed from previous generations, as well as inform how we adapt our instruction to meet their information needs.

LITERATURE REVIEW
Research exploring the information needs of students is not a new phenomenon, though looking at needs between and across generational cohorts is not as common. Benselin & Ragsdell demonstrated that all ages suffered from information overload, though the youngest generation expressed more confidence in their ability to use search engines while also expressing the most difficulty managing large amounts of information. In their research on Generation Y, Gardner & Egg examined library preferences but responses primarily focused on physical attributes and uses of library space. More recently, Cole, Napier & Marcum focused on the information assumptions of Generation Z, as well as the implications of these assumptions. While they found that the information assumptions held by Generation Z differed from previous generations, more research was needed into order to determine the significance of those differences as well as why Generation Z’s assumptions differed.

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METHODS

Overview

We began by reviewing the results of an initial survey of our Generation Z students to then develop our research questions. The data gave us a clear idea of gaps in our knowledge, and allowed us to run the survey again, paired with 20 interviews, a year later. We thematically coded our results using Inductive Thematic Analysis Coding, and later checked for agreement between reviewer one and reviewer two utilizing Kappa to eliminate the possibility of chance agreements. Once established, we utilized descriptive statistics to determine which themes were more prominently present in our data set.

Developing Interview Questions

Having run in 2018 a modified version of the Generation Z: Information Facts and Fictions survey instrument developed by Cole et al, we identified several interesting data trends outside of our significant results that were inconclusive due to a lack of data. We identified this as an opportunity to repeat the survey in 2019, and to amend it with an interview protocol. Based on the most prominent data trends, we created 6 questions that focused on what a student’s initial process of finding academic data is, what are the characteristics they apply to reliable academic data and seek out information related to problems with access. The questions asked were as follows:

- Tell me a little about how you search for information when you have a research assignment or project for class. That is, what steps do you take when you are looking for information?
- When looking for resources for an academic project, do you ever run into situations where you find a large amount of useful sources or information? How do you decide what information will work best for your need?
- What does the word credible mean to you when an instructor asks for a “credible resource”?
- How do you decide for yourself what is a “credible resource” when searching resources in your academic studies?
- Has there ever been a situation where you were searching for information for your academic studies and couldn’t find a resource? Tell me about it.
- What about a situation where you think you found a resource you need for an academic project but couldn’t access it? Can you tell me about that situation?

Participants

Twenty-one students were interviewed during the fall of 2019. Selection of the participants in the interview portion of our study were pulled from a pool of students who identified themselves as willing to participate during the 2019 Generation Z: Information Facts and Fictions survey. This survey auto-excluded any students identifying as being born before 1994 and was distributed to all first-year students at the Ohio State University at Newark Campus. As incentive, we offered 25 dollar visa gift cards for participation in an interview, and as a result had a large pool of students to select from. We did our best to create a deliberate sample of students who were demographically representative of our campus, and succeeded in doing so.

Interview Process

During the interview processes we emphasized the anonymity of the interviews and required participants to choose an alias. All names found within this document are those chosen aliases. Six interview question was
asked of each student, with each interview recorded. Later each anonymized interview was transcribed through an external service for later analysis.

**Thematic Coding**

We utilized Inductive Thematic Analysis Coding, as established by Braun and Clark\(^5\) and expanded by Nowell, Norris and White\(^6\), in which each interview response was stripped of its identification data and sorted in excel by question. Each author then reviewed the responses separately for common themes, setting aside our expected responses, being open to the unexpected. We later came together to compare our findings and again reviewed each of the interviews to agree on found themes as well as pulling representative quotes from students. These were used to establish overarching themes before parsing each theme deeper. We utilized the initial representative quotes to establish subcategories, realizing that the breadth of topics discussed went much deeper than initially expected. Nine main themes were established starting with Web Above All, What is Credible?, Indicators of Authority, Time & Space & Stress, Problem Solving, No Loyalty, Finding Help, Emotional and finally Miscellaneous. While significant takeaways were found in most, we will be focusing only on those that are related to our topic of Opening the Way.

**FINDINGS**

**Web Above All**

This theme was established as students repeatedly mentioned starting with Google or the internet. Fern stated, “Okay, I typically search for information, I look at [sic], I go on internet, that's always my first source”. As a result, our subcategories in this theme are Google First, Databases, and Wikipedia. Students. This Category was most prominent when we asked question one, asking students about how they search for information, with 40% of the responses talking about Google first, and 28% mentioning databases in some context.

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<td><strong>(Q1) Tell me a little bit about how you search for information when you have a research assignment or project for class. What are the steps you take?</strong></td>
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**What is Credible?**

While we asked this question explicitly in question 3, the responses we got from it ranged from describing the people (Indicators of Authority) to describing the document, sometimes exclusively. The subcategories that emerged for this theme were Age of Document, .org .edu .gov, Peer-Reviewed and Ambiguously Reliable. Ambiguously Reliable often showed that students had an idea of credibility and what it entailed but didn't have the experience or vocabulary yet to describe. Violet told us “… Let me think. I'm trying to use the right wording. Just that it's also been researched and is credible or reliable in the fact that people have put time and effort into to creating information that they believe is sustainable for different ideas”. 36% of our responses from Question 3 were able to be categorized into Ambiguously Reliable, where students were trying to describe credibility, but ended up instead being incredibly vague, regardless of the interviewers asking for statements of clarification. We also heard responses here that some may expect, with 9% of responses talking about the type of website, and 11% speaking to the age of the document, although there wasn't enough of a consensus for us to be able to put an actual year range in our theme.
The codes in this theme showed up throughout our interview questions, demonstrating that students were deeply aware of the asks of a research project. Upon initial coding, the codes within this theme often lived under another theme. It was not until we had completed the codes and compared did we realize that the few that didn’t “fit” within other themes, were all discussing the intangible choices students make during the research process. Choices that revolved around, where to do research, how much time it takes, and the amount of stress these steps can make. Thus was born the codes, Databases are Confusing where students explicitly used the verbiage “confusing” to describe their interactions with databases, Informed Rejection, where students make a weighted choice on when to use or not use a source depending on the amount of effort it would take to utilize it, Changes Topic if too Difficult, which is self-explanatory. This code of Changes Topic if too Difficult showed up in 6% of our responses to Question 5, and the final code, Research is Time Consuming, is where students opened up about how long it took to find, access, and sometime use resources. Students were not afraid to explicitly say they ran into problems with databases in both finding resources and accessing. Matt share that “…it’s a little bit confusing because it takes you, when you click on something on the page of the original research database, it takes you to another page. But when you go to that other page you’re not… You don’t have access to any of those resources. And so you have to navigate around and make sure that the link in the original database isn’t taking you to that [sic], to the other webpage”. Matt’s response speaks to the time-consuming nature of research, something that showed up explicitly in question 5, with 6% of our responses mentioning it.

Emotional

This theme was the most surprising, with subcategories of Frustration, Passion/Joy, Confusion, Discouraged, and “Guilt”. Throughout the interview transcripts we found students often expressing varying but intense emotion when speaking about different aspects of the research process. Matt was expressed frustration in relation to access and the library, stating “It is the most frustrating thing ever. Because a majority of the time it’s like, hey, I can’t find this. They’re like, ‘Oh, it’s probably in a library’ “. We also heard generic discouragement or confusion during interview responses, such as can be seen in this statement from Jackson “I found things that were saying different things and talking about different things, which was weird”. These emotions were prominent enough to warrant their appearance twice, with there being two subcategories dealing with Confusion, one coming from the theme Time & Space & Stress explicitly calling out that databases are confusing and one seen within this theme for general confusion during the research process.
The final subcategory “Guilt” is in quotes. This is in part because there may not be a better term for it, but also because students occasionally are expressing an emotion very close to guilt or regret. Students are actively acknowledging that they could have “done better” in some way, whether they could have or not is to be debated. We hear statements such as the following from Jackson, “Sometimes I have to change the point I want to make a little bit, because I can’t find exactly what I want. That’s probably on me not being able to search properly”. This statement in not unsimilar to other responses, in which a student takes a perceived inability to do a portion of research as a personal failure, not seeing that they may have never been appropriately trained, a fact that is certainly not their fault. Guilt showed up in 2% of all responses, with frustration showing up in 6%. In question 5 alone, asking about access, frustration appeared 13% of the time.

**Assignment Redesign**

During the interview process we expected students to reference assignments specifically, but instead found a theme that showed how simple assignment redesign would have helped most of our students during some point of their research in the past. The first of our codes, *Review Assignment*, was not something that we explicitly asked students about, but showed up when we began asking them generically what their steps for research were, and how do decide what to use when they encounter substantial amounts of useful information. Our second code, *Text Based Resources*, referring to when students referred to a text-based resources, either in the course materials or syllabus rather than the assignment itself. This code primarily showed up in question one with 17% of the responses being coded into this subtheme when asking student’s how they search or information for a research project and what the steps they take are. The final code, *Assignment Prompt Drives the Direction of Research*, which showed up sporadically in our results was not entirely unexpected. Students spoke of the limitations of the assignment or using it to guide them when they were yet unconfident in their skills. In question 2 we see this code the most often, with 5% of our responses recalling the process of referencing the assignment to gain more clarity of the types of resources the instructor is requesting.

**Miscellaneous**

This is a catch all theme, with the subcategory of *Mentions High School, Evidence was shown of Self-Checking Knowledge, and Deeper Knowledge of the Publishing Cycle*. The only theme we are looking closely at in this current study is if a student mentioned high school as a reference point for when they encountered or learned an aspect of research initially. Students most often, 6% of responses, brought up their high school experiences during question 6, when we were asking about access, or a lack of. Often students went into intense depth speaking of research projects that were either made incredibly frustrating or had topics entirely redirected due to a lack of access while in high school, an idea that seems to carry forward into their university experiences.

**DISCUSSION & CONCLUSIONS**

**Limitations**

While there were limitations in this study, we do not believe they have affected the data we have reported. Limitations begin with the number of participants; although 20 students gave us a robust amount of data to work with, we suspect that some of the themes would more strongly be present with a larger data set. As a school located firmly in the Midwest, it might make one think that we are not able to supply robustly diverse data, but surprisingly we had a reasonably diverse student base we were pulling our interviews from, but as in most studies could absolutely include more diversity. We were able to be representative of our campus in our interviews, but strongly believe that two peoples voices cannot possibly make up the lived experiences for all of those who identify with them. We believe that this study can be generalized to American students but not past that without replication in other countries. This gives an opportunity for another institution to replicate our interviews.
more data, and a larger population of interview candidates, our findings will be stronger, and we will be able to flesh out our weaker themes.

**Searching for Information**

Students described their information seeking behavior as reliant on web resources to the exclusion of anything else. While students described themselves as frequent users of databases, they also expressed that they found databases confusing, making Google a more attractive starting point. Our data shows that students are aware of the time it takes to conduct research, and we can extrapolate that this reliance on web resources is in part due to time constraints: online search results and databases provide quick, easy access to resources and allow students to move on to the next stage of their research assignment. Students also mentioned the assignment itself as a guide for how they conducted their research, as well as their peers. Faculty and instructors would include suggested or recommended databases as part of the research assignment, making these sources the starting point for most students. Peers were seen more as a source of assistance, which is not surprising as their peers are awake during the same hours and are completing the same or similar types of assignments.

**Evaluating Information**

Throughout our interviews, students mentioned all the aspects of a good evaluation but on a very surface level: students knew to identify the domain of a website, the age of document, and if it was peer-reviewed, but could not explain why those elements were important to their research. Our code for “ambiguously reliable” was critical when analyzing this part of our interview transcripts, as students would identify a source as reliable but could not explain the reasoning that led to that decision. This does indicate that students have a mental framework for evaluation, but this framework is at a foundational level; as students mature as researchers, a more nuanced approach to research will come into play.

**Emotions**

One thing that surprised us in the data was the level of emotion that transcended all questions; students had a spectrum of feelings about the research process and their own research projects. In many cases, these were not just assignments, they were projects that students cared deeply about and wanted to be relevant. While this was an unexpected finding, it was consistent with research conducted by Kirker & Stonebraker that demonstrated how students view research as an emotional labor, and how emotion is present across the research process. Throughout the interviews, students described an emotional weight to the research process, and this colored how they view both the assignment and research itself. Frustration and guilt emerged as our most significant findings, but we also saw evidence of passion for a particular research topic as well as discouragement when a student was unable to find the information they needed. Further research is needed to determine the range of emotions student experience and how this emotion powers their research process.

**CONCLUSIONS**

Our preliminary data led us to suggest three pathways for application in the areas of access, outreach, and assignment/curriculum design. Students described a range of barriers when searching for information, including paywalled articles, user-unfriendly interfaces, and challenges developing search terms and keywords. Access to library databases can be challenging to students if they are unsure of the authentication method used by their institution; asking a single question survey at the end of an instruction session or during campus events can help pinpoint where students are encountering trouble. Framing authentication concerns as access issues will help librarians advocate for solutions from administration, positioning the library to increase student success by removing barriers to information and resources.

In terms of outreach, our data indicate that students see faculty and their assignments as guideposts for their research; if they have questions, faculty are among the first they turn to for help. While outreach to students is
an important part of our role, outreach to faculty is where we can reach more students at scale. Teaching faculty may be aware that students are struggling with research, but not how librarians can help faculty understand why students are struggling, and how to best address it. To be effective, this outreach must position librarians as partners within the classroom—incorporating the role of faculty librarians into our professional identities and highlighting the pedagogical knowledge that we bring to teaching faculty.

In recommending a third and final pathway, we point librarians to our data indicating how students use the assignment itself as a guide for their topics as well as direction for where to start their search process. Research assignments are a gateway into the course, and the primary way most college students experience research; librarians must become partners in the assignment and curriculum design process to address the research bottlenecks students describe in our data. In our outreach to faculty, we should highlight the importance that students place on the assignment itself and how the design of that assignment is critical to a positive and productive research experience for students. Our data demonstrate that students have strong emotional connections to their research, and want to investigate topics that are meaningful; their frustration stems from a lack of experience as a researcher. By collaborating with faculty to redesign assignments and curriculum, we can make the research process more transparent to students and decrease their stress levels around research assignments.

The overarching goal in this research is to discover the ways Generation Z students search for and evaluate information have changed and identify evidence-based recommendations for librarians to implement within their local context. Future research could explore the emotions undergraduate students experience as part of the research process, or the mental framework Generation Z applies when evaluating sources. Student voices are an integral part of this research project, and the authors encourage future researchers to implement a mixed-method research design if they choose to build upon this research.

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