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Generation Z: Facts and Fictions

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Information Facts and Fictions

Ashley Cole, Trenia Napier, and Brad Marcum

Libraries have long embraced service-oriented, user-centered approaches. Consider S.R. Ranganathan's 1931 theory *Five Laws of Library Science,* which includes three clearly user-centered tenants (every reader his or her book, every book its reader, save the time of the reader) and two that arguably hint at a user-centered approach (books are for use, the library is a growing organism). Despite such foundational user-focused theories, early research into information seeking focused not on user needs and behaviors but on "the artifacts and venues of information seeking: books, journals, newspapers,… and the like."[1] This method of investigation persisted through the 1960s, with researchers focusing on the information types, or *what*, users selected, with little to no interest as to *why* users selected particular pieces of information or the assumptions they made about information.[2] In the 1970s, William Perry's scheme of intellectual and ethical development heralded a shift toward user-centered investigations, which were extended by similar theories from Mary Field Belenky et al., Marcia B. Baxter Magolda, and Patricia M. King and Karen Strohm Kitchener. Of particular influence, however, was the work of Brenda Dervin, who challenged ten assumptions that she determined dominated and distracted research concerning information seeking. While Dervin's research focused on adult public library

users and their general, everyday information needs, her ten assumptions reso-
nated with academic libraries serving the more formalized information needs of
the higher-education student. Dervin's challenges of these flawed assumptions,
along with the work of other like-minded researchers and practitioners, illus-
trates a paradigm shift in library theory and practice, reflected in the literature
by research focused on user assumptions about the nature of information and
knowledge acquisition.

In recent years, academic library literature, and literature from higher
education in general, has heavily focused on generation Y, better known as
the millennial generation.[3] As the first generation exposed at an early age to
computers and the Internet in their homes and schools, millennials demonstrate
a marked increase in familiarity and use of digital technologies when compared
to previous generations. This increased use and cognizance of technology,
however, does not necessarily translate to a more information-savvy generation,
and recent research ascertains many tech-saturated populations possess poor
information literacy skills.[4]

Complicating matters further, students coming of age and entering
higher education in 2013 differ from the millennials in subtle, yet distinct and
powerful ways, due in part to their ubiquitous digital environment. Born in
the early to mid-1990s, this newly emerging generation's label has yet to be
finalized, although suggestions range from post-gen (referring to its members
tendencies to broadcast even the most minute details of their lives via social
media) to post-millennials or generation Z (in homage to its predecessor).
Although the generations overlap a few years, sharing a common history and
somewhat similar experiences with technology, the emerging generation,
hereafter referred to in this chapter as generation Z, can be distinguished
from the millennial generation in that its members have *never* lived in a
disconnected world. In many cases they have been "wired" 24/7 from birth
and, as such, seldom differentiate between their "online" and "offline" worlds.
Whereas millennials began interacting with technology and the Internet
in their early to mid-elementary school years, generation Z entered primary
school having experienced a wide range of digital technologies and devices,
from PCs to smartphones, allowing them to connect to and consume, modify,
and create a wealth of information. The ubiquity of smart mobile devices with
direct connections to multitudes of free web authoring services, online social
networks, information outlets, and collaborative platforms empowers these
students to consume and produce information in ways heretofore unimagined,
making them the most information-immersed generation in history. From

SMS, Facebook, YouTube, and Twitter to Google+ Hangouts, FaceTime, and Skype, this generation is developing an instinctive set of behaviors and expectations about the nature of information as well as its access, consumption, and creation.

The authors recognize such highly connected, digitally founded environments inevitably affect our incoming students' assumptions about information. Generation Z's information milieu allows content to be ever-changing, individualized, and personal. Such an environment calls for students to develop and strengthen the critical thinking skills necessary to recognize and accommodate these information characteristics. By examining generation Z through the lens of Dervin's assumptions, we hope to define and challenge the information assumptions of generation Z in order to realize the possible implications of such assumptions on our interactions with these students and the faculty we work with to serve them.

Background

How one comes to know, the beliefs one has about knowing, and one's expectations about the nature of information are developed through learning experiences and shaped by situational factors. Reciprocally, the nature of knowledge and learning, or epistemological beliefs, influences the learning experiences of students. Research suggests that such learning experiences encourage deeper introspection and enable the development of sophisticated beliefs about learning and knowledge.[5] Psychological research into the development of epistemological beliefs and their effect on decision-making began in the early 1950s; since, researchers have become increasingly aware of the effect of students' beliefs about knowledge and learning on academic performance.[6] Inspired by William Perry's scheme of intellectual and ethical development, psychologists have developed theories illustrating how epistemological beliefs develop over time. Four central theories and models of epistemological development address and define linkages in cognition and situational factors as they relate to our assumptions about information and information acquisition. While Dervin's ten assumptions of information and information seeking provide the theoretical framework on which the current study is based, these four theories inform the current study and, as such, are worthy of a brief review.

Review of Epistemological Theories

Scheme of Intellectual and Ethical Development

Psychological research into epistemological beliefs concerning information began with Perry's scheme of intellectual and ethical development. The first to study college undergraduates' beliefs about knowledge, Perry suggests that college students make meaning of their educational experiences through developmental stages based on personal assumptions. Starting in the 1950s, Perry conducted a longitudinal study involving primarily white male undergraduates from Harvard.[7] Through a series of interviews, Perry identified nine epistemological positions, which he grouped into four categories: dualism, multiplicity, relativism, and commitment within relativism. Students move through these developmental positions, responding to new experiences by relying on and adhering to existing personal assumptions (dualism) at one end of the spectrum or critically evaluating and incorporating information according to context and situations (commitment within relativism) at the other end, oftentimes modifying personal assumptions in reaction to new information.

Women's Ways of Knowing

Belenky et al. identified limitations in Perry's study and conducted similar interviews with women to discover how their epistemological beliefs vary in comparison to their male counterparts. Belenky et al. suggested that women possessed five unique perspectives through which they view reality and draw conclusions: (1) silence, in which one feels both mindless and voiceless; (2) received knowledge, in which information is received and reproduced from an all-knowing authority; (3) subjective knowledge, in which truth is personal, private, and subjectively known or intuited; (4) procedural knowledge, in which one engages in a conscious, deliberate, and systematic *analysis* of knowledge and information; and (5) constructed knowledge, in which one "integrate[s] knowledge that [one] felt intuitively was personally important with knowledge [one] had learned from others."[8] These five ways of knowing depict a woman's cognitive development, each dependent on the other to progress.

Epistemological Reflection Model

Baxter Magolda developed her model of epistemological reflection in an attempt to address gender-related differences noted in the work of Perry and Belenky

et al. Through a five-year longitudinal study, Baxter Magolda found that college men and women experience four ways of knowing that develop over time: absolute, transitional, independent, and contextual.[9] Absolute knowers assume that knowledge is absolute, and uncertainty is only in relation to the unknown, while those in the transitional knowing stage shift the focus of knowledge from acquiring to understanding.[10] Independent knowing allows the student to begin to question authorities as all-knowing and trust their own opinions about information.[11] Knowers in the final stage, contextual knowing, now have the ability to construct their own perspective by contextually judging evidence. Baxter Magolda determined that patterns of knowing are determined by one's own personal experiences and that personal experiences ultimately assist in cognitive development. Educational experiences strengthen these epistemological beliefs and, as a result, contribute to a higher level of knowing.

Reflective Judgment Model

King and Kitchener's reflective judgment model asserts, "As individuals develop, they become better able to evaluate knowledge claims and to explain and defend their points of view on controversial issues."[12] To illustrate this developmental progression, King and Kitchener used the reflective judgment interview to ask participants to address and describe their position to a problem. The reflective judgment model explains intellectual development through the application of seven stages of development, which are further classified into three broader categories. In this model, individuals transition from believing knowledge is certain (pre-reflective) through acknowledging knowledge is uncertain and that some problems do not have a right or wrong answer (reflective) to finally recognizing that "knowledge is not given but must be understood in relation to the context in which they were generated" (reflective thinking).[13]

Dervin: Information Seeking and Information Use
Sense-Making Theory

Dervin's work identified and challenged information assumptions dominating research on communication and information seeking, ultimately leading to the development of her sense-making theory. Dervin's research focuses on the individual as he or she seeks, finds, and accesses information in different, indi-

vidualized situations and contexts. These situational and contextual constraints and assumptions about information ultimately establish gaps that impact one's ability to use or apply information in order to "sense-make," or construct an understanding of and apply information to one's own needs.[14]

Ten Information Assumptions or Myths

In relation to her sense-making theory, Dervin identified ten assumptions (which provide the framework for the current study) that affect both the individual's approach to locating, accessing, evaluating, and using information and the methods and systems through which information professionals and institutions address information needs.[15] While others have provided insightful summaries explaining these ten fundamentally flawed assumptions, they are, in brief—

1. Only "objective" information is valuable.
2. More information is always better.
3. Objective information can be transmitted out of context.
4. Information can only be acquired through formal sources.
5. There is relevant information for every need.
6. Every need situation has a solution.
7. It is always possible to make information available or accessible.
8. Functional units of information, such as books or TV programs, always fit the needs of individuals.
9. Time and space—individual situations—can be ignored in addressing information seeking and use.
10. People make easy, conflict-free connections between external information and their internal reality.[16]

Dervin posited that in order to provide the most effective services and resources, we must take such assumptions into consideration in the development of services, resources, and systems of information access, storage, and retrieval.[17]

Purpose of Study

A cursory glance at the literature concerning today's traditional student reveals stark differences in the information environment, practices, and beliefs of these students as compared to the original populations studied by Perry, Belenky et al., Baxter Magolda, King and Kitchener, and Dervin. We can be certain that

generation Z's collaborative, individualized, and evolving information environment impacts their information-seeking behaviors and, more importantly, their assumptions about information; however, *how* and *in what ways* remain unexamined. Given this theoretical orientation, the authors propose a pilot study with the purpose of establishing a body of preliminary descriptive, qualitative information exploring the following research questions:

1. Are Dervin's ten information assumptions present in generation Z students?
2. Has technology hampered or assisted generation Z's beliefs about how one finds, accesses, and uses information?
3. How does their collaborative, individualized, evolving information environment affect generation Z's information assumptions?
4. Do the assumptions and expectations of this new generation call for a new approach our services, resources, and/or systems?

Methods and Procedures
Subjects and Setting

With the goal of viewing generation Z through the lens of Dervin's information assumptions, the authors sought to survey generation Z students currently enrolled as freshmen at a higher education institution using a survey instrument designed to explore the assumptions that generation Z makes about information. Eastern Kentucky University's (EKU) Institutional Review Board approved the study and granted permission for EKU to serve as the research site. EKU is a "regional, co-educational, public institution of higher education centrally located in Richmond, Kentucky, offering general and liberal arts programs and pre-professional and professional training at both the undergraduate and graduate levels."[18] EKU's service region extends into eastern and south central Kentucky, an area comprised of mostly rural counties in the Appalachian mountains of Kentucky.[19] Total enrollment in the fall of 2012 was 15,968, including part- and full-time students enrolled at the main Richmond campus, three regional campuses, several educational centers, and online.[20]

Current literature does not agree on any one particular year as a line of demarcation between the millennial generation and generation Z, although most research acknowledges a generational shift occurring in the early to mid 1990s. For the purposes of this study, the authors recognize 1994 as

a transitional year and establish a birth date of 1994 for the beginning of generation Z. Using this definition, the first batch of generation Z is coming of age and entering institutions of higher education as freshman in 2013. Since EKU requires all incoming freshman students to enroll in a freshman orientation course during the first semester of freshman year, the authors speculated that freshman orientation courses would most likely provide the highest concentration of students falling within the targeted range of birth dates for generation Z. To facilitate data collection, the authors further narrowed the research population by targeting 12 freshman orientation courses scheduled for both a library orientation/tour and a follow-up bibliographic/library instruction session (most freshman orientation courses receive only the orientation/tour); the rosters of these particular freshman orientation courses included *only* first-time freshman. While the resulting population may not be representative of all generation Z students, the pilot nature of the current study, time constraints connected to the academic calendar, and issues concerning accessibility of a viable student sample necessitated this convenience sampling of students.

Data Collection

As stated, the focus of the study is to examine how the information assumptions of generation Z students adhere to or deviate from Dervin's ten information assumptions, or, as labeled by Donald O. Case, "Dervin's Ten Myths about Information."[21] To test generation Z's information assumptions, the authors created a 24-question survey using Dervin's ten assumptions—or, more specifically, Case's 2002 reimagining of Dervin's assumptions—as a framework. While based on Dervin's work, these questions were not taken directly from Dervin's original research questions. Those questions were uniquely formulated to assess the information-seeking and sense-making behaviors of Dervin's specific study populations and also were too exhaustive for the authors' pilot study. Rather, in the spirit of the experiential nature of the pilot study, the authors formulated the questions based upon their cumulative experiences in relation to Dervin's ten assumptions, modifying based on feedback from institutional library colleagues. The authors propose that the survey questions be revisited following the pilot study to reassess the effectiveness of each question in gauging adherence to or deviation from Dervin's assumptions, which is reflected in the discussion and results section of this paper. Each survey ques-

tion was presented as a statement about information and/or research, and respondents were asked to indicate the degree to which they agree or disagree with the statements, based on their own assumptions and experiences, using a seven-point Likert scale (see Appendix 5A).

The authors solicited the assistance and approval of the 11 teaching faculty assigned to the targeted 12 freshman orientation courses. The eight teaching faculty who consented to allow their students to participate in the study assisted with the research by distributing a survey packet containing the questionnaire and an informed consent form to students a week prior to the second library visit, with instructions to return the packet during the second library visit. Completion of the research instrument was strictly voluntary and, apart from requesting date-of-birth information from each respondent in order to limit to the authors' definition of generation Z (only students born in or after 1994 were included), the authors collected no personally identifiable information in the context of the study. Further, informed consent forms were separated from surveys before data entry and analysis.

Data Analysis

Data analyses comprised the following steps: collecting the surveys; verifying the entry of the requisite date of birth and completion of each survey to be included in the pool; entering data obtained from the surveys into Excel spreadsheets; using Excel formulas to calculate percentages of students who responded to each question with *totally disagree* (1), *moderately disagree* (2), *slightly disagree* (3), *neither agree nor disagree* (4), *slightly agree* (5), *moderately agree* (6), or *totally agree* (7); and analyzing and drawing conclusions from the data collected. Responses on the Likert scale (1–7) were tabulated and generalized into three categories: *disagree* (1–3), *neutral* (4), and *agree* (5–7), while still preserving the granularity of the individual one through seven responses.

Of the 87 completed surveys, eight were disqualified because the respondents' birthdates were prior to 1994, six were disqualified because the respondents did not list a birthdate, and 73 fell within the delineated age parameters, leaving N=73. Nine respondents failed to fully complete the survey by answering all 24 questions. These surveys were not disqualified, but to preserve the validity of the sample, analysis of the questions left blank was adjusted to take into account this lower number of respondents.

Limitations

Broadly speaking, generation Z is described within this study and in much of the external literature as having lived in an ever hyper-connected world from birth; however, such definitions fail to adequately consider variables such as socioeconomic status, gender, ethnicity, language, education, or cultural or ethnic and religious differences. Due to the experiential, pilot nature of the current study and to accommodate the time constraints and concerns of the faculty and classrooms in which the study was executed, the authors consciously chose to collect and consider only the age of participants and forgo any investigation into mitigating factors beyond age. The authors did not intend to evaluate the survey questions in a quantitative or statistical manner in this initial pilot study. Rather, the authors anticipated seeing recurring generation-based themes emerge in relation to Dervin's Ten Myths about Information and information seeking through a qualitative and descriptive analysis, presenting opportunities for more in-depth research in the future. Given the lack of demographic data beyond birthdates, the diversity inherent in all generational groups, the differences between EKU's demographics in relation to other institutions, and the small sample population, we would be remiss in assuming our findings could be used to make comprehensive generalizations about generation Z. As such, the authors acknowledge the sample population may not be representative of all generation Z students. Regardless of these limitations, however, important findings and themes do arise. While this research is only a sampling into generation Z's assumptions about information, the analyses and recommendations add to the understanding of gen Z students and serve as an entry point for a broader, more diverse conversation.

Discussion and Results

Students' cumulative responses were mapped to Dervin's Ten Myths about Information to determine to what degree, if any, the information assumptions held by this group of generation Z students deviated from each of the ten myths about information and information seeking (see Appendix 5B). The results are discussed in the following sections.

Myth #1: Only "Objective" Information Is Valuable

An information literate student knows how to find information and ascertain if it is credible, accurate, and reliable, all while identifying which sources should be avoided because of inaccurate or simply irrelevant information. Such critical thinking skills also attribute to the ability to understand the significance of sources that do not adhere to objectivity. In fact, many experienced researchers and scholars reject the assumption that *only* objective information is valuable. Recognizing that true objectivity cannot be achieved and that all sources are created under and carry with them certain biases, such sophisticated researchers understand that objective and even seemingly biased information can be of use if carefully evaluated and considered in the proper context, situation, and application. To test this assumption in generation Z students, the authors asked participants to consider statement 18, "Editorials and other opinion-based pieces are useful," and statement one, "Only information based on research is credible." Survey results show that while some generation Z students seem to be transitioning beyond this assumption, the percentage of respondents that adhere to this assumption—or myth—remains substantial. Nearly 51 percent of respondents agree that only information based on research is credible, while roughly 32 percent disagree. Contrarily, 50 percent agree that editorials and other opinion-based pieces are useful.

The authors recognize that gen-Zers may misconstrue the purpose of statement one, answering in a way they presume librarians and faculty want them to, particularly in the context of their experiences with academic assignments (the design of which often stipulates a need for more scholarly, research-based information sources). Even so, statement 18 suggests that generation Z's experiences with blogs and other social media have inculcated a familiarity and confidence in parsing opinion-based sources. This may be leading generation Z to transition to the understanding held by most experienced researchers or scholars: While research-based information is often of higher quality and is generally more reliable, especially when researching and conversing in a scholarly milieu, opinion-based or seemingly biased information can be useful if evaluated and used with a critical eye. Nevertheless, the vast amount of information available to gen-Zers in the digital environment requires constant examination and (re)evaluation; thus, librarians and faculty must not ignore the individual assumptions and skill levels of the students with whom they work. Rather, librarians and faculty should be mindful of this dilemma and provide

guidance through formal learning activities, such as instruction in information literacy and research practices that look beyond categorizing information as simply "black and white" to acknowledge those "gray areas," in order to encourage critical thinking.

Myth #2: More Information Is Always Better

Gen-Zers may embrace the abundance of information available in their highly connected, digital world, considering 74 percent of respondents agree with statement ten that "you should keep searching even when the first few sources on a topic seem to answer the question or help complete an assignment," but student responses to related statements suggest they might not know just what to do with all that information once they have it. For example, gen-Zers were divided about how to handle information saturation, with 64 percent disagreeing with statement 17 that "it is sometimes difficult to choose what information to keep and what information to toss" when researching, and 48 percent agreeing with statement 22, "The more information I find, the more overwhelmed I feel." These responses confirm that the "more information is better" assumption is still strong with generation Z, while presenting the troubling conclusion that many students are ill-equipped to cope with the modern day glut of information. The authors acknowledge students might self-report a propensity to search beyond the first few seemingly "correct" sources to please authority figures, such as faculty and librarians, who have reminded them to "look beyond the first few pages of a Google search." Perhaps in reality many students do just that—stop at page one of any search. Regardless, these findings, coupled with gen-Z's self-reported difficulty and anxiety in evaluating and sifting through information, are still quite insightful and should be applied to our reference and instructional services.

For example, assumptions and approaches that advocate a focus on the amount of information fail to recognize the individual need, situation, and context of the user, thus reverting back to approaches that focus on "the artifacts and venues of information seeking" while ignoring *why* and *how* students select and apply information.[22] Most librarians and faculty consider themselves experienced searchers and, likewise, are often much more sophisticated in their search strategies and ability to formulate and manage information-seeking strategies. For such experts, accustomed to the rigor of scholarly research, more information is almost always better as a comprehensive examination of any research topic is optimal. However, such expert searchers should not forget

that each student's individual information need must be considered in light of the context and situation of that need as well as each individual student's prior experiences with incorporating information, information-seeking strategies, and the tools and sources available. As such, we must restructure our services, particularly our reference interactions, to investigate and accommodate the unique information needs, contexts, and situations of our students. Training and assistance in search and evaluation strategies to winnow the most important and relevant information sources from the easily obtained mountains of information now available will be of particular benefit to gen-Zers.

Myth #3: Objective Information Can Be Transmitted Out of Context.

Generally speaking, generation Z understands that "information only has meaning in the context of what a person knows, understands, or creates."[23] For example, 74 percent of respondents disagree with statement seven, "As long as the author is a credible expert on a topic, there is no need to read the entire article/book," and 78 percent disagree with statement two in that "when doing research, it's okay to ignore information that contradicts your opinions." These survey responses indicate gen-Zers understand that while there are individual units of information to glean meaning from and that provide a great deal of meaning within, the context of the entire work and, as such, are dependent on this relationship for significance. Nevertheless, respondents are conflicted in regards to statement 23, "It is acceptable to quote facts out of context to make a point," in that only 43 percent of students disagree with this statement, while 20 percent remain neutral and 37 percent are in agreement.

Mass media and our approaches to educating students about it give this particular assumption a greater impact than first realized. News is now acquired through a variety of sources, including collaborative social networks such as Twitter and Facebook. For this reason, our daily news is "unattached and often without meaning," but it is within the context of what a person knows that information establishes meaning, in that without context, information becomes irrelevant. While gen-Zers understand the nature of context and its importance, this does not deter them from isolating facts to make a point. Given the contradictory assertions made in this assumption, librarians and faculty should be conscious of the need to support our students in critical thinking and

reinforce these rules and values as early and as often as possible in the future. Encouraging students to evaluate what they encounter in mass media and our educational system further demands an altered approach to instruction, one that goes beyond simply communicating information to ultimately instructing students on how to become informed, critical thinkers.[24]

Myth #4: Information Can Only Be Acquired through Formal Sources

Student responses confirm generation Z no longer assumes that information can only be acquired through formal sources. In fact, when asked to agree or disagree with statement 11, "When researching, it is ok to use information you find on-line," 82 percent agree, while 51 percent disagree with statement 15 that "sources found in the library are all you need to answer your question or complete an assignment," thus reflecting a similar sentiment. Encouragingly, 69 percent of respondents report a healthy skepticism of informal sources by disagreeing with statement 21, "I find friends, family members, and classmates more useful than authors, professors, or scientists," although 61 percent agree with statement 16, "I use Google, *Wikipedia*, blogs, and social media more often than I use library databases, reference books, or other library sources." Such responses indicated that gen-Zers tend to rely on a diverse set of formal and informal information to satisfy their needs; however, survey questions were not designed to calculate how critically students evaluate their sources.

While gen-Zers appear to be moving beyond the assumption that information can be acquired only through formal sources, many faculty and librarians reinforce this assumption in their academic interactions with students. Faced with undergraduate "Google" papers filled with low-quality informal sources, many faculty strictly regulate or forbid the use of informal sources in student papers to ensure a higher level of source quality, and many librarians focus almost exclusively on formal tools and sources (e.g., subscription databases, library catalogs, and scholarly literature and presses) when assisting or teaching students. As our students become more comfortable and immersed in the less formal free web environment, and as the abundance of varying qualities of freely available, easily accessible information increases in such environments, the role of faculty and, particularly, librarians as supporters and facilitators of information literacy becomes progressively critical. Gen-Z's

information environment necessitates librarians and faculty to foster in students the skills necessary to evaluate information contextually "in the wild," so to speak, rather than exclusively teaching students to rely on the tools, limiters, and lexicon of academia's formal sources and tools.

Myth #5: There Is Relevant Information for Every Need

To test this assumption, the authors asked participants to consider statement three, "I can always find exactly what I need when searching for information online or in the library." Analysis of the survey question revealed that 60 percent of respondents agree, indicating generation Z students continue to assert the assumption that "there is relevant information for every need" and remain committed to the notion that information is available for *every* problem. This reflects an "amateurish" overconfidence, not informed by experience or, perhaps, informed only by experience researching relatively simple and close-ended topics and augmented by movies and pop culture trumpeting "everything you ever wanted to know is one Google search away," not to mention slick advertising personifying the omnipotence of technology—just ask Siri!

One can speculate that our digitally native, wired gen-Zers might be even more susceptible to this notion than their predecessors, considering the sometimes ambiguous nature and wealth of information available to students in the digital environment. Faculty and librarians are often at ground zero with students during the search process and are well positioned to reinforce that many topics have not been fully explored. It is also important to remember that the capabilities of the faculty member as the expert researcher and the capabilities of the undergraduate as the novice researcher are often at a disjuncture, provided that most gen-Zers have not attained the level of cognitive development required to comfortably deal with the ambiguity of academic research and "do not think in terms of information-seeking strategy, but rather in terms of a coping strategy."[25] The perception that research is simply a means to an end, needed only to complete coursework, contributes to the sanguine feelings of gen-Zers; however, more experienced researchers and scholars understand that research is a method of inquiry and discovery as well. To that end, information professionals must remain mindful of

student assumptions as future generation Z students may illustrate an even stronger shift toward this notion as technology continues to saturate their everyday lives, compounding these natural and developmentally common tendencies.

Myth #6: Every Need Situation Has a Solution

The inherent flaw of this assumption is that information alone will not meet every need because *every* need does not have a single clear, established solution; nevertheless, 65 percent of student respondents continue to agree with statement four that "there is an answer to every question—you just have to find it." The magnitude and availability of digital information coaxes students into a false assumption that a resolution can be found with a simple click or swipe of the finger, but students fail to understand that the Internet is becoming so expansive that is it difficult to organize, let alone search. Results from subsequent survey questions illustrate divergence, considering that gen-Zers are torn on the assumption illustrated in statement six, "If I cannot find an answer to my question or sources for an assignment, I must be doing something wrong." Responses are divided almost evenly, with 43 percent disagreeing and nearly 31 percent agreeing with this statement. For this reason, we can assume that our information-rich environment incites doubt in gen-Zers about their ability to find and access information. This indicates that some students may understand that solutions to our problems are not always found in formal systems like the library or the less formal World Wide Web—occasionally, solutions must be carefully crafted by the individual, informed by an arsenal of information, rather than easily and simply plucked directly from an information source. Additionally, librarians and faculty oftentimes also fail to understand that a student's problem cannot always be answered using only conventional resources. Sometimes students are not looking for a solution that comes in a clean, canned response, even though our systems strive to package information as such. As professionals, we must rid ourselves of our own assumptions before we can help students move beyond their assumptions, thus offering our students the freedom necessary to investigate information and seek solutions in and from diverse sources and places while encouraging and supporting them in applying critical thinking skills in crafting their own solutions from the information at hand.

Myth #7: It Is Always Possible to Make Information Available or Accessible

While generation Z is truly a generation of "digital natives" who have never known a world without the Internet, smartphones, and iPads, we do not live in a perfectly ordered universe in which information that is not available or accessible can be made so at whim.[26] Student responses illustrate a divide, in that only half (51 percent) of the respondents agree with statement 12, "I can always find and access information I need" and 62 percent with statement 20, "Any information I could possible need is available locally or online." The majority of generation Z students believe that our digital environment creates an open arena for information, with accessibility easy to institute and maintain at all times; however, while digital resources allude to a plethora of information, the needed information may not always be available. Nevertheless, we can ascertain that generation Z students are beginning to deviate from the foregoing assumption. Results illustrate that some gen-Zers understand that information systems are limited due to our constantly changing needs, given that one-third of responders (29 percent) dispute the assumption of an open, ever-accessible information environment.

While information professionals understand the fault in this assumption, libraries are also inadvertently strengthening student assumptions concerning ubiquitous availability and accessibility through the establishment of "just-in-time" models. For example, patron-driven requests through interlibrary loan have increased accessibility and availability to materials, in turn reinforcing the idea that information is *always* available or accessible. In addition to an awareness of the effect of the free, open web, librarians must also maintain an awareness of the effect interlibrary loan and just-in-time models have on student perceptions of availability and accessibility. Further, they must be prepared to explain why some information is difficult—and sometimes nearly impossible—to access, even with these just-in-time services, whether those reasons are tied up in translation or transcription barriers, journal embargos, or when the answer simply does not exist.

Myth #8: Functional Units of Information, Such as Books or TV Programs, Always Fit the Needs of Individuals

An impressive majority (over 95 percent) of students surveyed agree with statement five, "Sometimes what I need might not exist in one place—I might have

to use several sources to answer one question," lending credence to the idea that gen-Zers recognize the flaws inherent in assuming that predetermined information packages set by authors, publishers, vendors, or even libraries always translate easily and cleanly to the individual's information needs. Surprising, then, is the realization that students were more divided in regards to statement 13, "I should be able to find one perfect source to answer any question I might have." While 50 percent of students surveyed disagree with this statement, presenting a similar tone as that set with statement five, the other 50 percent either agree (29 percent) or are unsure or neutral (21 percent) in relation to the idea that "one source should do it all." The relatively high percentage of students demonstrating agreement or uncertainty about statement 13 might give librarians and faculty cause for pause. However, upon further reflection, the authors recognize that statement five might be leading students, as librarians and faculty alike often impress on students to "go beyond the first page of the Google results." It is possible, then, that many students answered in the affirmative to statement five because they knew their authority figure—their classroom instructor and class librarian—would expect them to investigate multiple sources before settling on an answer, rather than because they truly agree with the statement. While the authors cannot say for certain, it is therefore also possible that gen-Zers adhere to the faulty assumption that there exists one (or perhaps a couple?) perfect piece of information for every possible need and that those pieces of information are functional and useful as presented, requiring no additional work or thought on the part of the individual information consumer.

Additional research is necessary to make any definitive statement about student assumptions as they relate to information units, which might also require that the authors revisit and revise the questions used to gauge this particular student assumption. Regardless, librarians and faculty can and should use their instructional platforms and relationships with students to demonstrate the need to evaluate and sift through individual units of information, evaluating what and how to integrate appropriate pieces of larger information units into their own knowledge bases or academic products while simultaneously rethinking the way we create and develop student resources. Further, while intended to gauge student assumptions concerning units of information, statement 13 might also have implications on student assumptions as they relate to Dervin's Myth #5, "There is relevant information for every need," in that it seems to indicate students believe there exists at least one perfect source for every need or question.

Myth #9: Time and Space—Individual Situations—Can Be Ignored in Addressing Information Seeking and Use

The proliferation of and quality enhancements to just-in-time and "at-a-distance" services have alleviated many time and space barriers; however, individual situations, as well as an individual's perception of his or her own situation, shape and define information needs in fundamental ways, and thus must not be ignored. Survey results indicate generation Z students recognize the need to be aware of their own situational constraints, including time and place constraints, in order to meet their information needs: Seventy-eight percent of students surveyed disagree with statement eight, "There is no need to start your research early—any information you might need is freely and readily accessible" (22 percent neutral or agree), while a similar percentage (71 percent) agree with statement 24, "If a book or article is not readily accessible to me, I move on to something I can access now." Similarly, 49 percent of students surveyed disagree with statement number 14, "I accept information that is 'good enough' if it is easily accessible, not necessarily the best information." Yet an alarming percentage of students agree or are uncertain/neutral (33 percent agree, 18 percent neutral). While these results indicate that gen-Zers recognize the need to consider time and space barriers when selecting information, it also suggests that they might resist digging a little deeper or pushing a little harder to find a more suitable, appropriate information source. Librarians and faculty need to be aware of this possibility and encourage students to dig deeper and seek assistance when in doubt.

Additionally, the authors recognize potential flaws with the statements used to gauge student assumptions in this area. First, similar to statement five, it is possible that students responded to statement eight in a way they believe their authority figures would approve of, considering librarians and faculty alike encourage students to "start early" to avoid stress and possible "information roadblocks." Second, the authors again recognize that, while intended to gauge student assumptions concerning time and space and individual situations, statement 24 might have also implications for Dervin's Myth #7, "It is always possible to make information available or accessible," in that it could imply a deviation from this assumption, indicating students realize not all information is readily or easily available and accessible.

Myth #10: People Make Easy, Conflict-Free Connections between External Information and Their Internal Reality

An ordered world in which our personal reality is perfectly aligned to the external information we encounter does not exist. The connections that our students make between external information and their internal realities illustrate how people inform themselves and the conflicts that arise when these two realities differ.[27] Highly connected, technophile gen-Zers may embrace this conflict more frequently than students who are less digitally connected, considering the seamlessness and ease with which transitioning between online and offline worlds exposes them to information contrary to their own beliefs. In fact, student survey responses in this area illustrate that gen-Zers acknowledge the need to weigh and evaluate information, both within the context of what they believe to be true and in relation to additional external information. Seventy-three percent of students surveyed disagree with statement 19, "When I encounter information that differs from what I believe, I immediately feel that the information is wrong and I don't use it," while 59 percent responded in the affirmative to statement 24, "When I encounter information that differs from what I believe, it makes me want to research more," indicating that this new connected generation maintains a healthy skepticism in regards to external information but is also aware of personal assumptions and works to keep these assumptions in check when evaluating new or foreign information.

While the implications are certainly encouraging, suggesting students are moving beyond the assumption that engaging with information is "easy," the data should not be misconstrued as a recommendation that librarians and faculty no longer need to be concerned with assisting students in developing the critical thinking intrinsic in the acquisition and development of information literacy skills. Gen-Zers recognize that conflict may exist between their internal realities and external information; however, it is likely they may still struggle with the application and incorporation of external information into their own internal realities.

Conclusion

Generation Z students have lived their entire lives with instant access to information on nearly any topic imaginable. These students are the most connected and diverse in our history and are using technology in ways never thought possible.

Implications for libraries, universities, and higher education remain to be seen, but we must prepare ourselves for the significant impact generation Z will have on academia. Early research into information seeking and beliefs about information advocated for a user-centered, service-oriented approach to library services. Even so, students and academic faculty and staff continue to look for standard answers from the "right" and "objective" source, believing that, if we only search long enough and wade through enough information, we will discover the proverbial gold at the end of the rainbow; in reality, the search for information is no rainbow and that pot of gold may not be exactly as we hope.[28] An analysis of the survey data reveals gen-Zers deviate from Dervin's ten assumptions of information in significant ways. Nevertheless, students continue to exhibit some of the same fundamentally flawed ideologies of their predecessors. Student information assumptions—as well as librarian and faculty assumptions about student information assumptions—have interfered with our ability to fully focus on the individual information needs, contexts, and situations of our students, a problem with the potential to become ever more prevalent as tech-focused, information-saturated gen-Zers advance into higher education.

Dervin advocated that information professionals, such as librarians, apply sense-making as a methodology, thus bypassing and overcoming the allure of such assumptions by asking neutral, rather than closed or even open, questions. Such questions allow the librarian to see past the user's stated need to the nature of the underlying situations, the possible gaps faced by the user, and the expected uses informing the user's need and information assumptions.[29] The authors agree, believing that such an intentional, focused approach to discovering the underlying information gaps and assumptions of our students is more vital now than ever with the incoming class of tech-focused, information-saturated gen-Zers. Further, the authors recognize that the study's sample size is relatively small in comparison to the larger generation Z population; the study population might be less tech-savvy or information-saturated than its peer populations, especially considering EKU's largely rural service region; and that, beyond age, little is known about the demographics of the study population—all of which impact the generalizability of the results. In response, the authors propose that research into larger, more diverse and digitally immersed populations of gen-Zers could reveal even more drastic deviations from Dervin's Ten Myths about Information, and acknowledge that other factors not addressed in this pilot study—students' educational preparedness, L1/L2 or ESL status, socioeconomic factors, gender differences, etc.—should be considered in order to fully explore adherence to

or deviation from Dervin's Myths. Regardless, additional research and attention to the ways generation Z interacts with and develops beliefs about information is necessary to ensure that we do not leave our students behind in terms of information literacy as they move forward in an increasingly connected, ever-changing, information-rich environment.

Acknowledgments

Appendix 5A.
Survey Instrument
Generation Z: Information Facts and Fictions

Date of Birth:_____

Below is a list of statements about information and research. Please read each statement carefully and indicate the degree to which you agree or disagree with it. Please respond as honestly and objectively as you can. Use the following scale:

Totally Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Totally Agree
1	2	3	4	5	6	7

1.	Only information based on research is credible.	1 2 3 4 5 6 7
2.	When doing research, it's okay to ignore information that contradicts your opinions.	1 2 3 4 5 6 7
3.	I can always find exactly what I need when searching for information online or in the library.	1 2 3 4 5 6 7
4.	There is an answer to every question—you just have to find it.	1 2 3 4 5 6 7
5.	Sometimes what I need might not exist in one place—I might have to use several sources to answer one question.	1 2 3 4 5 6 7
6.	If I cannot find an answer to my question or sources for an assignment, I must be doing something wrong.	1 2 3 4 5 6 7
7.	As long as the author is a credible expert on the topic, there is no need to read an entire book/article.	1 2 3 4 5 6 7
8.	There is no need to start your research extra early—any information you might need is freely and readily accessible.	1 2 3 4 5 6 7
9.	When I encounter information that differs from what I believe, it makes me want to research more.	1 2 3 4 5 6 7
10.	You should keep searching even when the first few sources seem to answer the question or help complete an assignment.	1 2 3 4 5 6 7
11.	When researching, it is okay to use information you find online.	1 2 3 4 5 6 7
12.	I can always find and access the information I need.	1 2 3 4 5 6 7

13.	I should be able to find one perfect source to answer any question I might have.	1	2	3	4	5	6	7
14.	I accept information that is "good enough" if it is easily accessible, not necessarily the best information.	1	2	3	4	5	6	7
15.	Sources found in the library are all you need to answer your question or complete an assignment.	1	2	3	4	5	6	7
16.	I use Google, Wikipedia, blogs, and social media more often than I use library databases, reference books, or other library sources.	1	2	3	4	5	6	7
17.	It is sometimes difficult to choose what information to keep and what information to toss.	1	2	3	4	5	6	7
18.	Editorials and other opinion-based pieces are useful.	1	2	3	4	5	6	7
19.	When I encounter information that differs from what I believe, I immediately feel that the information is wrong and I don't use it.	1	2	3	4	5	6	7
20.	Any information I could possibly need is available locally or online.	1	2	3	4	5	6	7
21.	I find friends, family members, and classmates more useful than authors, professors, or scientists.	1	2	3	4	5	6	7
22.	When searching for information, the more information I find, the more overwhelmed I feel.	1	2	3	4	5	6	7
23.	It is acceptable to quote facts out of context to make a point.	1	2	3	4	5	6	7
24.	If a book or article is not readily available to me, I move on to something I can access now.	1	2	3	4	5	6	7

Appendix 5B.
Survey Questions and Results Mapped to Dervin's Ten Myths about Information
Generation Z: Information Facts and Fictions

Survey Questions and Results Mapped to Dervin's Ten Myths about Information

1. Only "objective" information is valuable.

1. Only information based on research is credible.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	5	7	11	13	23	11	3
Percentage	6.85%	9.59%	15%	17.81%	31.51%	15%	4.11%
		31.51%				50.68%	

18. Editorials and other opinion-based pieces are useful.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	2	2	12	19	25	8	2
Percentage	3%	3%	17%	27%	36%	11%	3%
		23%				50%	

2. More information is always better.

10. You should keep searching even when the first few sources on a topic seem to answer the question or help complete an assignment.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	2	2	4	11	31	17	6
Percentage	3%	3%	5%	15%	42%	23%	8%
		11%				74%	

22. When searching for information, the more information I find, the more overwhelmed I feel.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	4	6	15	13	23	8	4
Percentage	5%	8%	21%	18%	32%	11%	5%
		34%				48%	

17. It is sometimes difficult to choose what information to keep and what information to toss.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	2	0	6	18	28	15	4
Percentage	3%	0%	8%	25%	38%	21%	5%
		11%				64%	

3. Objective information can be transmitted out of context.

7. As long as the author is a credible expert on a topic, there is no need to read the entire article/book.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	7	18	28	10	6	3	0
Percentage	10%	25%	39%	14%	8%	4%	0%
		74%				13%	

2. When doing research, it's okay to ignore information that contradicts your opinions.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	28	19	10	7	6	3	0
Percentage	38.36%	26%	13.70%	9.59%	8.22%	4.11%	0
		78.08%				12.33%	

23. It is acceptable to quote facts out of context to make a point.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	13	9	11	13	11	10	6
Percentage	18%	12%	15%	18%	15%	14%	8%
		45%				37%	

4. Information can only be acquired through formal sources.

11. When researching, it is okay to use information you find online.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	0	2	3	8	17	27	15
Percentage	0%	3%	4%	11%	24%	38%	21%
		7%				82%	

15. Sources found in the library are all you need to answer your question or complete an assignment.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	6	14	17	10	11	4	1
Percentage	8%	19%	24%	14%	15%	6%	1%
		51%				22%	

21. I find friends, family members, and classmates more useful than authors, professors, or scientists.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	15	14	20	12	7	2	1
Percentage	21%	20%	28%	17%	10%	3%	1%
		69%				14%	

16. I use Google, *Wikipedia*, blogs, and social media more often than I use library databases, reference books, or other library sources.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	6	9	6	7	16	11	17
Percentage	8%	13%	8%	10%	22%	15%	24%
		29%				61%	

5. There is relevant information for every need.

3. I can always find exactly what I need when searching for information online or in the library.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	1	5	7	16	20	16	8
Percentage	1.37%	6.85%	9.59%	21.92%	27.40%	21.92%	10.96%
		17.81%				60.27%	

6. Every need situation has a solution.

6. If I cannot find an answer to my question or sources for an assignment, I must be doing something wrong.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	4	13	14	19	15	7	0
Percentage	5.56%	18.06%	19.44%	26%	21%	9.72%	0
		43.06%				30.56%	

4. There is an answer to every question—you just have to find it.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	2	2	12	10	19	14	14
Percentage	2.74%	2.74%	16.44%	14%	26%	19.18%	19.18%
		21.92%				64.38%	

7. It is always possible to make information available or accessible.

12. I can always find and access the information I need.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	2	2	16	14	19	10	6
Percentage	3%	3%	23%	20%	28%	14%	9%
		29%				51%	

20. Any information I could possibly need is available locally or online.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	1	5	7	15	26	11	8
Percentage	1%	7%	10%	21%	36%	15%	11%
		18%				62%	

8. Functional units of information, such as books or TV programs, always fit the needs of individuals.

5. Sometimes what I need might not exist in one place—I might have to use several sources to answer one question.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	0	0	1	2	18	22	30
Percentage	0%	0%	1%	2.74%	24.66%	30.14%	41%
		1%				95.89%	

13. I should be able to find one perfect source to answer any question I might have.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	8	15	13	15	13	5	3
Percentage	11%	21%	18%	21%	18%	7%	4%
		50%				29%	

9. Time and space—individual situations—can be ignored in addressing information seeking and use.

8. There is no need to start your research extra early—any information you might need is freely and readily accessible.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	17	24	16	8	7	1	0
Percentage	23%	33%	22%	11%	10%	1%	0%
		78%				11%	

24. If a book or article is not readily available to me, I move on to something I can access now.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	2	2	6	13	25	16	9
Percentage	3%	3%	8%	18%	34%	22%	12%
		14%				68%	

14. I accept information that is "good enough" if it is easily accessible, not necessarily the best information.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	3	15	17	13	13	6	5
Percentage	4%	21%	24%	18%	18%	8%	7%
		49%				33%	

10. People make easy, conflict-free connections between external information and their internal reality.

19. When I encounter information that differs from what I believe, I immediately feel that the information is wrong and I don't use it.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	16	16	21	11	8	1	0
Percentage	22%	22%	29%	15%	11%	1%	0%
		73%				12%	

9. When I encounter information that differs from what I believe, it makes me want to research more.

	DISAGREE			NEUTRAL	AGREE		
	1	2	3	4	5	6	7
Total	3	5	4	18	25	15	3
Percentage	4%	7%	5%	25%	34%	21%	4%
	16%				59%		

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