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The Librarian as Cryptologist
Critical Thinking Dimensions in the Role of The Librarian in Decoding Assignments

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Modern search behavior patterns and strategies have increasingly placed academic librarians as 'decoders' of the work assigned to the students they serve. This function extends beyond the traditional reference interview and places the librarian into collaborative academic relationships where practices traditionally delivered by ancillary support services become part of the reference and instructional process. The academic librarian is entrusted with the role of "cryptographer," navigating thesis assumptions with students to complete assignments. By examining how reference questions are constructed and the terminology they use in particular with often repeated terms, librarians can learn to identify those queries that require critical intervention and demand instructional intercession serving to illustrate how frequently students may stumble with syntax, words, and phrases which prompt librarians to aid students in "decoding" their assignments.

Assignment mediation has always been part of the role of the academic reference librarian, thus the format and the structure of distinct projects may prompt students to seek additional interventions. This increasingly propels librarians into helping students "crack the codes" embedded in the construct of their questions by teaching critical thinking and writing schemas, and not just identifying sources. Librarians then become code breakers, deciphers, and partners in helping students unravel the "enigmas" embedded in the structures of research questions.

This can be evidenced by the presence of certain often-repeated words found in students' theses. These words denote that the student is failing to comprehend their role in their research task and in the process of constructing their answers. These words present a sort of "cipher" that prevents the student from moving forward. Students accustomed to finding easy answers on platforms such as Google expect that library research will be the same and certain words in their assignments make them second-guess their approaches as their tested research strategies and behaviors have consistently yielded "answers" to their questions on the internet is not producing the same results. Questions that combine phrases as simple as "What are the effects of. . ." indicate a need for digestion and critical thinking, but the student is looking for academic sources that directly answer the query without any sort of extrapolation. The high frequency of these phrases and words in students' queries turns librarians into cryptologists, who are now centered on the task of helping the student not only to locate resources, but also to understand that answers need to be extrapolated, constructed, and developed, not found. The issue is one of comprehension and critical thinking, and it increasingly drives librarians to new avenues for teaching collaborations,

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instructional innovations, assessment, and reference interventions. This also places the librarian in the conundrum of having to help with a question often with little contextual framework.

The librarian is then a cryptologist: An interpreter, a decoder, and a translator who can simplify and clarify how to critically analyze students' assignments beyond the confines of what the reference interview has trained librarians to do. The librarian in observed experience becomes a vital, visible mediator between understanding the praxis of the research assignment and the writing process. This inserts the librarian into interdisciplinary collaborations and in areas not traditionally recognized as part of their service. Experience at my institution supports all these factors, and further seems to support that students experience these difficulties from the inability to extrapolate- to understand their role in reaching a successful resolution to their inquiry. The librarian is often drafted through their responsibilities in reference and instruction to serve as an arbiter for the student. The librarian becomes a cryptologist in partnership with the student in decoding the ciphers of the assignment.

The Librarian as Assignment Cryptographer

Our library boasts a robust information literacy program, where teaching faculty are contacted before the dates when we meet the students. Assignments are requested from faculty, and our instruction team is always available to support the classroom faculty with assignment development or refinement. Our library leads workshops for faculty in assignment construction and other areas of research and information literacy. These are available for students and classroom faculty. Nonetheless, the main issue is not centered on the construction of the research assignment, although this can be at the center of the students' confusion at times, but on their ability to critically understand what is being asked.

The construction of assignments, their terminology, and their complexity "baffles" and frustrates students accustomed to searching for information and locating answers in Google.[1] The librarian's role in the chain of reference assistance to research assignments and the questions they carry have been shaped by the fundamental schemas of the reference interview, which for decades has informed librarians on how to better understand the framing of a reference question. In the last few decades, information literacy has become one of the bedrocks of our academic contributions, but it remains often constrained to "Searching as Strategic Exploration" [2] or centered on the discovery and identification of resources. Students may favor Google for its simplicity, but intrinsically trust the library: "level of trust in libraries as public institutions, . . . has endured despite marked declines in trust in other traditional gatekeepers of information."[3]

The flow of the chain of coding and decoding around a written assignment task begins shortly after the instructor dispenses a task, and the student either generates a thesis or follows a predetermined question. Students are often required or encouraged by their professors to contact the library. The professor warns the students to avoid using online sources and promote the use of the library. Nevertheless, as Neera Mohess explores "Community College students are often underprepared to do college-level research."[4] Central to their research difficulties is their inability to shift their search strategy from the Web, with its focus on providing "answers" to critically evaluating the assignment and breaking their thesis into suitable keywords not only for the ease of searching the databases but also for critically achieving a proper outcome to their arguments.[5]

The issues with searching in Google are strongly elucidated by Terrell Heick:

By ignoring the phases of inquiry learning, premature Googlers often find what they want rather than what they might need. In this way, it underscores the independence of information rather than interdependence. Instead of looking at information and data as components of knowledge, and then understanding, it instead treats information in more binary terms: black or white, right, or wrong, credible or not credible, good or bad.[6]

Google searching is further explored by Don Latham, et al, as they discuss their findings on how students report that "databases are seen as difficult to use, and so the default source is Google."[7] The students also highlight issues with citation, identifying keywords, and evaluating resources.[8] The experience of searching academic databases is new, unfamiliar, and one which now calls for the application of skills and critical thinking schemas they may have not advanced through their prior educational experiences. The learner desires to replicate the experience of Google, but their expectations about the use of library databases are tinted, incorrectly by their experience with web services.

After years of locating answers to their questions via Google searches, the student mimics the same patterns on library databases and seeks to obtain the same results. As the illusion of generating a quick answer via the library databases brings the student to the library, the librarian must help the student decipher the question. This may present opportunities to expand information literacy, but also could be frustrating, as librarians are not always familiar with how individual instructors orient their assignments.

Sara D. Miller outlines the need not only to understand the tacit assumptions that are made in terms of student knowledge and preparedness but also the importance of "decoding the disciplines."

Since the practices of disciplinary information literacy are inextricably entwined within those larger disciplinary values and assumptions, finding effective places and methods for information literacy integration within disciplines involves identifying and examining these nuances—bringing tacit disciplinary processes and understandings to light. It is these unspoken or assumed elements for which the Framework in concert with Decoding the Disciplines is particularly equipped to uncover.[9]

As librarians, we do not always understand all the different elements that shape a discipline and which may form a part of the structure and assessment of a student assignment.

An analysis of the structure, syntax, and terms commonly found in reference questions could serve to provide insight for librarians to successfully resolve learning objectives and craft appropriate critical thinking interventions.

Cryptography Terms

The terms listed in table 1 have been labeled "Cryptology Terms." These have been encountered across hundreds of reference interactions. These expressions form a part of many students' questions and for the most part, are common interrogative words and terms, but beyond their basic function to signal a question or that answers are needed, these words can become a signal to the librarian. Their presence in a student's question can serve as a signal to the librarian that the student may require assistance beyond the identification of resources, as many times students in the process of research are fixated in locating answers, not in developing an answer. The list should not be considered as final as there are other ways in which students indicate their need for assistance, but this sample serves to illustrate the librarian's role as a "cryptographer." See table 1.

Table 1. Cryptology Terms

What
What --- benefits
What is
Why
How
How (it) Supports
How (its) Changing
How --- Benefits
How (effect)
Affecting
Affects
Benefits
Discuss
Effects
Focused on
Related- relates to
Versus
Is there
Difference(s)
Causes
Evidence
"In which way"
Characteristics
Improve
Limiting
Reducing
Compare and Contrast
Both Sides (Pro-Con Arguments)
Should --- (Argument)
More --- Than
Reliable
Views
Facts
Quality

The presence of the words in table 1 does not always result in the need to offer the student supplementary instruction, but often they are indicators that such instruction is warranted. The student is often seeking information that looks to resolve their search for resources as simply and quickly as possible. The quest for those "magical articles" staggers the investigative process of many undergraduates. The sources may or may not exist in the way students are accustomed to finding them. Students wish to see articles with keywords closely resembling or mirroring the format of their question, such as what they encounter in Google. This is due to a lack of direct instruction on the rudiments of extrapolation. They want the *Why*, the *How*, the *What*, usually accompanied by a variable that seeks to compare or convey the effects of X or the influence of Y, answered specifically, completely, and unequivocally. Take for example a question such as "why is education important?" Some students may not understand that articles that explicitly address this type of query may not be available, and that to write about this thesis successfully they need to critically read and extrapolate from the source material. In this case, the librarian may demonstrate how to separate the question into critical components and teach models of extrapolation from ancillary sources.

Modern catalogs and discovery tools that are available at the disposal of the librarian allow for searching that simulates natural language. For example, a simple request on OneSearch, the federated catalog used at the City University of New York libraries, can yield several for the question such as "How does social media *affect* our privacy?" However, the word "affect" may confound students as they fail to realize that they are in charge of developing their conclusions about the effect of something or how something is affected.

The role of a decoder is even more complicated as some students bring partially complete assignments and sometimes even the complete project. Dealing with incomplete or poorly generated queries fits perfectly into traditional librarian areas of expertise, but when students bring their entire project assignment as given to them by their professors into the reference desk, this can result in unclear decoding experiences. In this manner, librarians also expand into a cryptographer role by filling lacunae in the students' knowledge or offering ways to interpret newly learned content and at times even offering language translations for the learners.

English as a second or other language needs may also be an issue, as vocabulary needs demand decoder duties. It may be necessary for culturally proficient librarians to translate from one language to another, with a particular understanding that humility and empathy contribute to assisting students of diverse backgrounds.[10] Teaching extrapolation, inference, digestion, and comprehension thus becomes a part of the reference routine.

Cryptography as Critical Thinking Skills During Reference

Critical thinking continues to be an elusive skill to define for information professionals, but the relationship between information literacy and the fostering of critical thinking is inseparable.[11] This cryptographer role is compounded as we are called to help decode not only the elements of the question but also its critical thinking components. The need to decode the question necessitates that the librarian teaches or offers the students background information, clarifies terms, and vocabulary, or fills gaps in their knowledge. Other questions may also require that we teach content in a manner distinct from traditional reference functions. A student may ask a question like "who invented capitalism?" The librarian then must locate content that defines capitalism, and then engage in an explanation of capitalism that is contextually defined.

While librarians are often called upon to perform services such as helping students narrow or broaden their topic, or identify peer-reviewed or primary sources, even these common interventions can be complicated if relevant research materials do not exist. As an example, a pupil may ask for peer-reviewed articles on concepts of love and relationships in the context of the novel, *The Brief Wondrous Life of Oscar Wao* by Junot Diaz and may need to be taught how to utilize the actual text as evidence. This proves the lack of exposure to the rudiments of inference. Critical thinking definitions and the application of teaching modalities remain inconsistent in their applications as evidenced by the needs of students requiring help in decoding their questions. However, the relationship between critical thinking and information literacy is inextricably linked.[12]

Conclusions

For students, the search for sources is a call for assistance in processing the contours of how to approach or deconstruct an assignment. It is a plea for help in the interpretation of their thesis. The librarian then is engaged in the role of "decoder," interpreter, and analyst. Librarians can be ready for this call by learning to identify those often-repeated terms and questions that may demand additional instructional interventions. Once these patterns are recognized, students can be better assisted, thus reducing their frustration and increasing opportunities for their success.

Librarians offer cross-academic collaborations at all levels and reach out to instructional faculty to assist with the construction of research assignments. The modern environment provided by online search engines encourages students to look for complete, formulated, and easy answers rather than construct answers via critical analysis, and the presence of certain words will signal that additional interventions in decoding may be needed.

Our role as cryptologists in reference interactions continues to expand. A role with pitfalls, tacit assumptions, and cross-disciplinary alignments. Cryptology is not always exact. Given the students' internet searching behavior patterns, students are predisposed to look for "answers," not construct them, and thus they experience frustration when they encounter tasks in which the solutions require research from previously unexplored sources such as peer-reviewed articles, technical writing, scientific journals, and academic writing. Future studies can well expand on the syntax and construction of student reference questions and the need for the librarian to engage on critical thinking mediations.

The role of librarians as cryptographers of students' assignments is a function that may go officially unnoticed, but it is a purpose that is tacitly and robustly encouraged by disciplinary faculty as they increasingly urge students to request librarian assistance. These partnerships contribute to the academic success of students and place the academic librarian as an essential link in the

instructional chain. Libraries should continue to engage in and seek to integrate workshops in critical thinking, question analysis, and assignment construction to help and support our academic community.

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