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Undergraduate Research

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Professional Writing: Improving Research Methods by Utilizing Library Resources

The process of synthesizing a valid research question is difficult yet exciting. Although a research question provides the foundation for a successful research project, the purpose and structure of the question may change as the research process continues. This dynamic within research is what makes the process challenging yet rewarding. Although it may seem as if your current direction is the best and only option, the act of uncovering new information can significantly change the direction in which your research proceeds. As a student who took Science Writing in the Fall of 2018 semester, I had the privilege of living and breathing the research process through a challenging project, evolving the way I analyze scientific information and filter through an immense body of information.

The research project, called Analyzing Published Research, had four assignments to help build skills related to scientific communication: an analysis of peer reviewed research, a clarification of one's topic to a valid research question, an annotated bibliography consisting of appropriate sources, and the final product as a research review article that surveys the state of knowledge of the topic and identifies concerns which drive future research. Prior to beginning this assignment, I had a passionate desire to research procedures within cardiothoracic surgery. In the summer of 2018, I was a research volunteer at the Department of Cardiac Surgery at the University of Maryland Medical Center where I had the opportunity to work on managing clinical trials and to observe various cardiothoracic surgeries. From this experience, I knew the best way to familiarize oneself with a field was to explore the associated published literature. However, I was not yet sure how to explore research and how to specify what I have learned to a specific valid research question.

Acting through the direction of my professor, I decided to explore the UMD Mckeldin Database Finder. PubMed is the most comprehensive database for exploring research within medicine, so I used PubMed extensively to explore journals within cardiothoracic surgery. I examined articles on several different topics including endocarditis, tricuspid valve repair, bypass surgery, and even heart transplants. However, what was of particular interest to me was the implementation of robotic mitral valve surgery into clinical practice. Specifically, many tertiary centers, including UMMC, do not use robotic surgery for mitral valve repair while many other centers did. This discrepancy helped me narrow down my research question to "How the implementation of robotic assisted mitral valve repair affects surgical outcomes associated with patients with degenerative mitral valve disease?". To test the validity of my question, I searched key words into PubMed and hundreds of research articles appeared. Through combining the library's database resources with my clinical experience, I was able to synthesize a valid research question which I am curious and passionate about.

Now that my research question was established, I had to determine significant and credible sources, construct an annotated bibliography to compile appropriate content, and then effectively organize information from the articles to outline my literature review. To navigate my way

through this difficult journey, I made use of library resources and took guidance from my English professor, Diana Friedman.

I read several types of sources using the PubMed database including: literature reviews, statistical reports, review papers, and research articles. Since the validity of my paper was dependent on clinical research, I prioritized reading research articles in the early stages of the research process. Before outlining my paper, I first examined the content of the research articles to determine which variables would be included to help answer my research question. This process was initially complicated, since each study used a myriad of medical measures to determine the effectiveness of the surgical procedure. However, after reading through several papers, I discovered that most papers included overlapping variables regarding the patient's health. These variables included morbidity, mortality, and even procedural time. TO help expedite finding appropriate research articles, I would use the bibliography of research articles to find other research sources. I also used Zotero, which I acquired from the Mckeldin website, to compile importance sources as I researched my question. Now that I had a strong background surrounding my question, I needed to outline my literature review and base it off my initial research question.

Under the guidance of my professor, Diana Friedman, I organized the research section of my paper based off trends within certain clinical variables. This helped me summarize trends with surgical outcomes associated with robotic assisted mitral valve repair, and effectively communicated research associated with the research question.

This assignment has taught me that annotated bibliographies and coherent/cohesive scientific writing are paramount to the research process. In order to understand any topic, one must first screen the field for valid research sources and discover popular areas of research. Then, one can synthesize a specific research question to help establish the direction of research. Using these two techniques, writing an annotated bibliography establishes the backbone of a strong literature review which can effectively communicate the research conversations within a field. Finally, the ability to clearly communicate scientific information is equally important to the intensity of the research process, as scientific advancement is dependent on scientific communication. As an aspiring physician and surgeon, the lessons I learned from this assignment will help me have a more significant impact on my field of interest.

If given the opportunity to repeat the research process, I would have consulted STEM librarians for researching and outlining for my literature review, as they have extensive experience with the research process. To meet the research needs of students, I recommend that librarians hold daily office hours and run research workshops specific to their expertise field. These office hours should be communicated through appropriate courses, and should be available on the Mckeldin website. These resources would give greater access to students working on research projects within various fields, and is a resource I would most definitely use if I were given the chance to repeat the assignment.

