2016 Willock Library Research Award Application Supplement Form

Name (s) - including group-mates if applicable: Joshua R. Owl

Category (college, department and major): Engineering, Dept. of Materials Science and Engineering, Materials Science and Engineering

Division: Undergraduate or Graduate: Undergraduate

Project Title: Laced with Uncertainty: The Impact of Shoe Gear Fastening on Dorsal Shear Stress

Essay (500 words maximum):

Over the course of this last summer, I was given the opportunity to participate in research through a position in iCAMP – the Interdisciplinary Consortium on Advanced Motion Performance – in the field of diabetes rehabilitation, in which I analyzed the effects of a new orthopedic shoe in regulating thermal response in a patient's foot. This line of work is something that I've hoped to be able to align myself with since I began my endeavors at the University of Arizona; coming from a small Native American reservation, I've experienced the kind of debilitation that diabetes causes, and have since wanted to work with alleviating these issues, one day giving back to my community. As a part of my work, I was tasked with writing a research paper and evaluating previous studies done in my field – something that I had very little experience with. I often found myself working in the Science and Engineering Library as a result, and with the aid and resources of the library, I was able to gather all the necessary components in completing my research.

First and foremost, I needed to analyze previous studies on the measurement of shear stress – which, in this instance, is essentially the friction and pressure between a patient's foot and their footwear. This is the essential mechanism to my research, as reducing shear stress meant less complications for diabetic patients during and after physical activity. Through the library, I learned how to utilize the many databases it offered, and how to properly search for topics relevant to my work – I was able to gather two dozen articles and studies that covered the evolution of shear stress measurement, the establishment of thermal imaging

(which I used) as a successful means of data collection and analysis, the correlation between thermal regulation and foot-related injuries, and much more. I also learned how to navigate sources like the New England Journal of Medicine and PubMed easily and effectively with the help of the library, something that is no easy task without. To manage my resources, I was advised to use Mendeley, and with a couple weeks' worth of analysis and compilation, the background and literature review of my project was finished.

Once my research was completed, the library helped me print a poster that bore the fruit of that summer's labor. This is something that I could not have done without over the last couple months, as I have taken it to conferences and poster session many times. Without this valuable resource, I would not have been able to share my work with others and develop my speaking and presentation skills, both of which are invaluable tools in my aspirations of attending graduate school.

Looking back, I can't imagine having done all that without the help of the library. I have since been able to easily find sources for research papers and to compile and synthesize information without an issue. I am very thankful to have an environment as supportive and accommodating as the UA library.