Eportfolio Reflection

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The work that I completed as a part of my cybersecurity degree program has helped me to advance and develop several professional skills. The skills which have had the greatest improvements and that stand out the most to me are technical writing, research, and critical thinking. I was able to have the greatest improvements in specifically these three skills because for each of these skills, there were several classes throughout my degree program which contributed to the development of the skill. For each of my skills, I describe and reflect on three artifacts that contributed the most in the development of the skill. The artifacts are a way to display how they have developed in a way that better prepare me for my chosen profession.

**Technical Writing**

Of the three skills, technical writing appeared in the most courses. I believe this is because writing technical reports is a large aspect of almost all cybersecurity related jobs. Within the field of cybersecurity, technical reports are written for a broad range of reasons. Because of this, technical writing is a highly sought out skill. The courses I took through my degree program that helped me to advance my technical writing skill were IT 419 (Enterprise Cyber Defense), CYSE 301 (Cyber Techniques and Operations), and ECE 455 (Network Engineering and Design).

Before I began my degree program, I already had some experience in technical writing. While I was in the military, I held a cybersecurity position for five years. During those five years, an important aspect of my job was writing technical reports based on network vulnerability findings. I found that through my coursework, I was able to expand my technical writing skill to include other types of cybersecurity reporting.

Of all three skills, I have seen my technical writing skill develop the most. Technical writing was required early in my degree program, starting as early as sophomore year. Because of this, I completed many courses that required me to practice different types of technical writing. Three artifacts that display the growth in my technical writing skill are labs from my IT 419 course, my CYSE 301 course, and my ECE 455 course.

**IT 419 Configuring and Testing Firewall Rules Lab**

During this lab we were to configure and test firewall rules that we set for our networks. Before this lab, I had a pretty good understanding of firewalls. I understood what the purpose of firewalls were, how to write rules, and how to implement firewall rules. However, I had never configured firewall rules on a firewall before this assignment. I found this assignment to have been very beneficial in adding to my knowledge of firewalls. Through this lab I was required to take all of the knowledge I had about firewalls and apply these concepts physically on the network device.

Within the field of cybersecurity, it is important to not only understand how different security devices/software work, but to also have experience configuring these devices. This is important because having hands on experience allows one to better understand the deeper concepts that apply to the device or software. During my job search, I often saw the requirement of “experience implementing and configuring network devices, firewalls, IPS/IDS, routers, switches”. The skills I gained during the completion of this lab contributed to this sought out job requirement.

Through this lab, and many other labs I completed in the IT 419 course, I practiced technical writing in a different way than I had experience with in the past. During the labs I completed in this course, I wrote technically in a way that a reader with no technical background would understand. This is a very important technical writing skill to have. Many times, a report that is written is due to a person who may not possess the same level of technical background as the writer does. It is important that the reader can understand what the report is about and can understand what the report means. This course challenged me to take very technical terms and use them in a way that a reader without a technical background would understand. My previous experience in technical writing solely dealt with reporting on network vulnerabilities and noncompliance.

**CYSE 301 Discovering and Exploiting Computer Vulnerabilities Lab**

This lab was very interesting to me because I had not completed something like this previously. In this lab I had to find vulnerabilities on a host and then use these vulnerabilities as a way to gain access to the host. I used a variety of methods including port scanning and penetration testing tools to gather information on a host. Then, with the information I gathered as well as the knowledge I learned in this course and outside of this course, I attempted several ways to gain access to the host.

Prior to CYSE 301, I knew “hacking” techniques like this existed, but I had not tested them for myself. By going through this lab, and many other labs from this course, I gained a better understanding of the “why” certain configuration settings make a host more secure. This understanding is frequently noted in job advertisements. Commonly, it is noted that a required skill is “can identify and mitigate host vulnerabilities to make them more secure”.

Throughout the labs in this course, I developed my technical writing skill by explaining what I learned from the completion of the lab in the lab reports. I think this is an important aspect of technical writing because there may be times when I will have to explain to someone what I learned and why it is important.

**ECE 455 Wireshark DHCP Lab**

During this lab, I gained a better understanding on the more intricate details of how DHCP works. Prior to this lab, I had knowledge of what DHCP was and what it is be used for, but I did not have a confident understanding in everything it takes for DHCP to work. The deeper concepts I learned in this lab about DHCP have been very beneficial. For many companies, DHCP serves a purpose somewhere within their network. A strong understanding of exactly how DHCP works will only be beneficial when moving forward in my profession. In job advertisements it is common to see “strong understanding in network troubleshooting and networking protocols”.

The technical writing skill I acquired through completing the labs in this course was writing a step by step procedure of how I completed a technical task. I was to write in a way knowing that the reader had a strong technical background. So, it was expected that my report would have minimal explanations and be direct with my writing.

**Research**

Though not as emphasized as the skill of technical writing, the skill of research was also another focal point throughout my degree program. The emphasis of research relates to the cybersecurity field more than many realize. The field of cybersecurity is so vast and is constantly changing. Many issues that arise within the field require one to research the problem to find the appropriate solution. If not properly researched, one could make a detrimental, irreversible mistake. This includes mistakes with repercussions such as requiring one to start over from scratch or repercussions that could even involve legal trouble. Because of the high consequences, correct research is required before implementing a solution to lessen the chances of making a mistake. Courses that contributed to sharpening my research skill were ENGL 307T (Digital Writing), IDS 300W (Interdisciplinary Theory and Concepts), and CS 495 (Principles and Practices of Cyber Defense).

Before beginning my degree program, my research skill was a beginner level skill. I did not have much practice in research other than papers I wrote in high school. My degree coursework helped to advance my researching skill to a more professional level. My coursework also helped me to research more efficiently. This is an important development of the skill. There is more information than one has time to search through. If a person is not practiced in researching efficiently, this can become extremely time consuming. Acquiring this skill becomes even more necessary when working in a field where time is a concern. There are times in the cybersecurity field when how quickly a task is completed, determines how detrimental the outcome is. Three artifacts that emphasize the advancement in my research skill are papers I wrote for my CS 495 course and IDS 300W course, and a website with research posts I created for my ENGL 307T course.

**ENGL 307T Website with Research Content**

For my Digital Writing course, our final project was to create a website on a topic of our choosing. There were several requirements such as a minimum number of pages and posts, but the content of the site was completely up to the student. I chose to create a site that focused on different ways music can affect the brain. Because I have no background whatsoever in the science of this topic, I had to do a decent amount of research in order to create each of my posts.

During this assignment, I learned a lot. I learned about how music can affect your mood and why. I learned how the tempo in music can help someone improve their fine motor skills that may have been lost due to an accident or stroke. Besides the information I learned during this assignment, this assignment also helped me to improve upon my researching skill.

I completed the research for this artifact before I had completed my other two, much more demanding, research artifacts in my ePortfolio. This is important because by completing this artifact first, I was better prepared for the more advanced research that was required of me for my other two artifacts. The research requirement for this artifact was to create three posts. Each post would cover one topic. Because my research focused on one specific topic, I was able to conduct my research in a much more organized and timely manner. This artifact is a huge reason I was able to develop a much more advanced research skill through my next two artifacts. This artifact served as a “steppingstone” to my current skill level and refined the very choppy skill I had prior to this assignment.

**CS 495 Botnet Lab and Lab Paper**

This research artifact required a much more advanced level of research than that of my ENGL 307T research requirements. The good news for me was that this artifact was to be completed in a group of three students. This artifact also served as a “steppingstone” to my final, most advanced research assignment which is the next artifact I discuss. Though the research was more advanced, it was divided between two other students and I. This allowed me to take on more topics to research, but to also not become too overwhelmed.

During the process of this artifact I developed a much deeper understanding of advanced computer exploits and how they work. I learned the security measures that have become common practices used to prevent against such advanced attacks. Completing this assignment challenged me to apply knowledge I gained throughout my degree studies and not just the knowledge that was provided in the course. In order to successfully complete this assignment intense research was applied to find a successful solution.

Of all the research artifacts, this one was related most to my degree on a technical level. Our professor not only required us to research and write a report on what a Botnet exploit is, the dangers of it, and how to prevent it, out professor also wanted us to successfully complete the exploit. To do so, extensive technical research was required to find the solution to this problem. This artifact better prepared me for specifically the type of technical research that will be required of me throughout my cybersecurity career.

**IDS 300W Research Paper**

This artifact was the capstone research project that was required by my degree program. Though the previous two did a good job preparing me for this artifact, I still had a challenging time completing this artifact. This artifact required not only for me to use a research process that I had not ever used before, interdisciplinary research, it also required me to do it all my own.

By completing this assignment, I was able to grow my research skill to that of an advanced level. I developed an advanced research skill through this assignment because of two reasons, the way in which I applied the research and the amount of research I conducted. I learned a new way to apply the researching process. I learned about and applied the skill of integration through research. Integration is not a simple skill to accomplish. The process of integration required me to take seemingly uncommon areas of study and find a commonality between them. The amount of research required for this assignment was the largest amount of research I have ever completed. The research for this assignment challenged me to take a broad topic with a vast amount of information and it create a focused research paper. When researching a topic that seems like it has endless amounts of information, it can be hard to keep a paper concise and on topic. This was a challenge for me, but my finished research paper proved that I was able to overcome this challenge.

**Critical Thinking**

Critical thinking is skill I have been applying since grade school. Everyone begins critical thinking at a young age, especially once school begins and we are required to begin taking mathematics classes. Though I have been practicing critical thinking for many years, the critical thinking skill I gained through my coursework is cybersecurity specific. I have applied critical thinking from a very young age, but I have not applied it to cybersecurity specific problems until I was required to do so through my degree program. Several courses throughout my degree helped me to develop cybersecurity specific critical thinking. These courses include CRJS 406 (Cyber Law), IT 419 (Enterprise Cyber Defense), and ECE 416 (Cyber Defense Fundamentals).

**CRJS 406 Case Study Analysis**

This artifact required me to decide a ruling for myself on a Supreme Court case. I had to justify the reasoning for my ruling based on cyber laws and the Amendments. Throughout the completion of this artifact, I had to pay extreme attention to the laws and what they apply to. I then had to read about the situation in the case, and the decide for myself if any laws applied to the situation and I had to explain why.

This artifact was difficult to complete. Before I completed this artifact, I assumed there were clear laws laid out for every situation. While I was completing this artifact, I realized this was not the case. The Supreme Court case at hand did not fit any of the laws in black and white so much so that the judges for the case ruled in favor 5 to 4. Because of this, I had to thoroughly understand the laws before I could apply them to the situation of the case.

Through the completion of this artifact, I developed a critical thinking skill that was specific to cyber laws. This skill is extremely important to have when entering a cybersecurity workplace. When handling anything cyber related, laws and regulations must be considered. This is because every network is designed and applied differently depending on what services the network provides to the company. Therefore, laws that may apply to a case in one network, may not necessarily apply to a case in a different network. It is important that one clearly understand cyber related laws and what situations they apply to.

**ECE 416 Encryption Algorithm Code**

In this artifact, I was required to write code that applied the process of RSA, an asymmetric encryption algorithm. This class did not teach any programming whatsoever. In order to complete this artifact, I had to apply what I had learned in previous coding classes. This artifact challenged me to apply critical thinking with knowledge I learned outside of this course. In my previous artifact I was not required to apply knowledge I had from outside of the course as I did with this artifact. Because of this, I did find this artifact to be more challenging than the previous artifact. I developed my critical thinking skill through this artifact buy learning to apply knowledge I had learned outside of the immediate information presented to me.

**IT 419 Company Security Consultation**

In this artifact I had to review a company’s current network security configuration and make recommendations on how they could make their network more secure. To complete this artifact, I had to apply all of my cyber network knowledge in order to make the most accurate and secure recommendations for the company. The critical thinking I applied in this project, was the most extensive cyber security related critical thinking I applied throughout my entire degree program. I had to take cyber knowledge I learned from this class, the cyber knowledge I learned in several other classes, as well as knowledge I had learned outside of college to complete this artifact.

Through this artifact, I learned that when using critical thinking in the workplace, I will be required to apply any related knowledge I have to the problem at hand. Many classes in college teach a lesson to the students and then require the students to apply the knowledge they just learned to a homework assignment or a lab. This artifact challenged me to apply more knowledge I learned outside of the course than in the course in order to affectively complete it.

The critical thinking skill I developed through this artifact is essential to the workplace. In many cases, the workplace does not provide all trainings to its employees. Many times, the employee is required apply knowledge that is learned outside of the workplace to solve a problem. I feel more confident going into the workplace developing this specific critical thinking skill.

Throughout the completion of my degree program, I regularly found myself pulling skills and knowledge I had from several classes to complete assignments. In hindsight, I realize most of my classes required me to use an interdisciplinary approach when completing assignments. When at the time, I was not fully aware that this was the case. An interdisciplinary approach works best for the field of cybersecurity. The field of cybersecurity does not fall neatly into a typical field of study therefore the best approach to cover all aspects within cybersecurity is an interdisciplinary approach. I believe that my degree program placed a big emphasis on developing skills that are important to have when studying in an interdisciplinary field. With the skills I developed and advanced through the coursework in my degree program, I feel more confident moving forward in my profession.