Reflective Essay

College was truly a customized and a unique experience for each person. When I just decided to attend, I had no idea what I wanted to study or who I wanted to become. After spending four years here, not only did I figure out what I liked and wanted to do in life, but I also discovered many new things about myself that I never really thought about. College really opened my eyes and really gave me a new lense that I can veiw the world through.

**Integration, Experiential Learning and Personalized Educational Program**

There where many classes that I was required to take at Bridgewater that I would have never taken otherwise. Looking back now, I am glad that some of those were required because they left a lasting influence on my life and taught me how to enjoy new things in life, which I had previously never even considered. Obviously, classes like Calculus IV and Modern Physics were very enjoyable and directly related to my major of Applied Physics, but I also greatly enjoyed other classes, such as Introduction to Western Music, taken during the May term of 2018, and Parent/Child Relationships, taken during the Spring Semester of 2019. Not only were these classes outside my major enjoyable, they even proved to be beneficial for me and helped me use some of the concepts introduced in them and apply them in my life and other major-related courses.

It is easy to see what I learned from my major and minor courses because that is what I was specifically studying. But even between them, there are a bunch of variations of what skills I learned that I will use later in life. I can clearly see that in my major I had two types of courses, practical and theoretical. Classes such as General Physics I and II, Classical Mechanics, Fluid Mechanics, Digital Electronics, Electricity and Magnetism, Electricity, and Experimental Physics were all practical and had immediate, real-world applications.

These courses taught me how to use math, formulas, and lots of data to solve basic problems. Experimental Physics really tied all the other practical courses together into one experience. In Experimental physics we had to replicate previously done experiments. In order to properly do so, we had to write a report that explained the theoretical background to the experiment, the procedure we followed, the data we took, how we processed that data, and finally the conclusions and practical applications we pulled for that particular experiment.

My most memorable experiment from that class was finding the Charge to Mass Ratio of an Electron, which I did as my final experiment for that course (Supporting item #1/Data Analysis Artifact: “Charge to Mass Ratio of an Electron”). The most important skill that I learned from this class was how to effectively collect, process and interpret data so that I can draw conclusions and meaningful results out of it.

I went beyond the theories provided in the lab manual and derived all the equations from basic, fundamental equations. This allowed me to really understand why certain formulas were introduced and why certain assumptions, such as assuming that the Helmholtz coils where perfectly circular, had to be made. Not only did delving deeper into the physics and theory help me experiment well, but it also inspired my Honors Project, which will be done in my final semester.

The data analysis was done in multiple steps. After everything was properly set up, my partner and I carefully took measurements of the voltage and resulting radius of the electron path. This then allowed us to calculate the Magnetic field and also the errors and uncertainties in all parts of the experiment.

This particular experiment taught me how to be careful and methodical whenever I am doing something so that it could be easily recorded and replicated. The data collection also forced me to explicitly label each batch of numbers so that I can stay on top of them and not confuse my own self with my own actions just because I thought I knew what I’m doing in my head. This skill will be especially important in my future career where I have to make sure that anyone can understand what I did and how without me having to explain everything to them all over again. The data collection will also allow me to make informed decisions and draw conclusions off of statistics and other raw data.

The second type of courses were the theoretical ones that required out of the box thinking and really forced me to be creative to solve those problems. These courses really challenged me because I am not used to thinking so creatively and really prefer when a problem has a straightforward solution and a practical application afterwards. The theory-based courses that I took were Modern Physics, Number Theory, Thermal and Statistical Physics, and Numerical Analysis. The most important skill I learned from these types of courses was to approach a problem from different angles and that there is not one straightforward way of getting to the answer.

Whether it was calculating the amount of thermal energy lost or how time dilation works, most of the problems presented forced me to approach them from every angle possible and with assumptions in order to solve them. The skills I learned here will benefit me directly in life where the answers are usually very complex and not very straightforward.

Courses in my major were not the only ones that taught me many new things. The biggest thing that I learned from my Parent/Child Relationship course, was how to take a specific concept and build a working and theoretical model backed by evidence around it. In my final paper for the class (Supporting item #2: “Building the Basics for School”), I designed a lesson plan and program aimed at parents to help them prepare their toddlers for school.

I researched many different approaches on how important people see early childhood education and what implications it has on the adult lives of those children. Most research showed that people who had early childhood education preformed much better with greater academic skills then their peers, earned more at their jobs, were less likely to participate in criminal activities and were less likely to experience teen pregnancy. However, other people argued that children should not need to do anything to prepare for school and that going to school will be enough to prepare them for future life. I found that preparing kids for school and actively pushing them to be and do better appealed to me much more than letting nature take its course with children.

In my program, I researched four skills, academic readiness, social readiness, independence, and communication skills, that the National Education Association has identified as vital in preparation for school. Then I designed a practical prevention program that was supposed to educate parents and guardians on how to prepare children for school and focused on four areas, preparedness, independence, social readiness, and communication skills. It was designed in such a way that it was the children driving their own education with the parents and teachers acting purely as monitors and helpers in rare situations. Next, the program included practical activities for each category along with a post-test for the parent to see if they can see a change in their child. As the final component for the Experiential Learning designation, I had to present my research and program to a couple of young families in the community. I found that there is benefits in preparing children for school and that preparing them not only benefits the child, but also the community around them.

What I took away from such an experience, was to be able to draw conclusions from something that does not have a definite answer like I was accustomed to in my math and physics courses. It also allowed me to learn and practice my communication skills by making the material understandable and presentable to not only myself but also to my listeners, who needed the material presented on an understandable and basic terms level. This skill of making my ideas presentable and understandable will be extremely important in my field of physics where everything can be extremely confusing to others if not explained properly.

**Engage Diverse Perspectives**

While I initially was very skeptical of why I had to take FILA courses when all I was interested in was science and math, I am now extremely grateful for the experience of some of those classes. One class that I was very dreading to take was Introduction to Western Music. Before taking the class, I could not find a single reason of why and how it would be useful to me in any way to take it. However, now that I have taken it, I am surprised by how entertaining, engaging and interesting it was. It now allowed me to enjoy older classical masterpieces in a new light and even managed to tie in some mathematics and science. This class also allowed me to make my favorite presentation on a musical piece called Dance of the Knights from the ballet “*Romeo and Juliet”* by Sergei Prokofiev (Supporting Item #3: Dance of the Knights).

The most important thing that I learned from taking this music class is that everything in life has much more to it that what we initially see it as. I didn’t think that there could be that much to music but my presentation on Dance of the Knights clearly shows that there are much more little things that go into making a quality musical piece. Even though this class did not have a direct relationship to my physics studies, I still got a couple lessons out of it for myself. First, I learned that there are lots and lots of math involved in how music works. The whole musical world is based on fractions and division. All this math is what makes music beautiful and compatible even though we, humans, do not usually even think about it that way. Another lesson I got was that there are many parts that make up the whole. In the presentation, there are different sections where the whole ensemble plays and also where there are just solos. Those contrasts and differences add beauty to the piece and make it pleasurable to listen to. Just like in music there are different instruments that work together to make the music beautiful and work, in physics there are many different forces and different laws that work together to make the world work. Even though music did not have a direct connection to my studies, it still managed to teach me little lessons that I can apply in the future and in my discipline.

**Public Discourse: Citizenship & Community Responsibility**

Another area that I would have never even thought about or done research in if, it was not for my FILA classes, would be my surrounding community and about the problems we face as a local community. One class that really taught me how to see other people’s perspective and see how social problem have many components that build up to them was General Psychology. My final term paper for the class focused on researching drug abuse and substance abuse (Supporting Item #4: “Psychology and Substance Abuse”). Addiction is not exactly directly related to my studies but is still interesting to me because it involves chemistry and biology which are still part of science. The most important thing I learned from this assignment was that drug issues are not some far away thing but present in our communities and affects us all in one way or another. My research also taught me the to look and recognize the signs of drug abuse victims and allowed me to help several people find the help they need.

Another class that forced me to think about my community was Oral Communications. The most important thing that this class taught me was how to speak to an audience and present my ideas clearly and concisely. We had to present many speeches in that class and it really taught me how to present my ideas without stuttering and in a seamless form. One speech that particularly stood out was my newscast presentation on artificial photosynthesis (Supporting Item #5/Digital Presentation Artifact). Artificial photosynthesis is a process that mimics plant photosynthesis but with other chemicals and on a grander scale. Unlike solar energy, artificial photosynthesis allows for the storage of the suns energy so that it does not have to be used immediately and right away. Research in this area is really important because if an efficient way to make artificial photosynthesis work can be found, it will help alleviate the energy crisis and help our communities in using less fossil fuels and other nonrenewable energy forms and transition to clean energy.

In my newscast, Dr. McNeil, from the Bridgewater Chemistry Department, is interviewed and he explains exactly how the process works and what modifications need to be made so that humans can use the energy efficiently. He says that the glucose that plants use as their storage system will not work efficient enough for human use. Instead he proposes that more research is used to try and store the energy in carbon or hydrogen bonds. There are still issues with that because hydrogen is extremely explosive and needs to be properly stored and protected. From this assignment I learned how to share my ideas with experts in the field and how to properly interview them and use their knowledge and expertise to support my argument and idea. Another side lesson I got out of this project was how important it is to recognize the issues our community around us is facing and try and use my knowledge and education for the betterment of those who do not have the same opportunity to go to college and get educated on all of this.

**Global Citizenship & Intercultural Competencies**

Another area I would have never cared about or done research in if I had to choose classes without FILA requirements would be how people are living outside of the United States and how ideas that we in the United States do not see as important or relevant, practically govern the lives of other people in different countries. Two classes that really forced me to consider global affairs were PDP-150 Leadership and Religions of the Far East.

The leadership course was part of the required Personal Development Program for all incoming students to Bridgewater. Looking back now, I do not have a single ounce of regret of having taken it. I came into Bridgewater being a very reserved person and kept all of my opinions about everything to myself and no one else. The Leadership course really pushed me to speak out and most importantly introduced me to other leaders around the world and the people they lead through different hardships and problems. One of the assignments I had to do wash a research paper on Russia’s invasion of the Crimean Peninsula (Supporting Item #6: Vladimir Putin and the Annexation of Crimea). I decided on this assignment because of my cultural background of being and ethnic Russian and having immigrated to the United States from Kazakhstan early in my life. The biggest thing I learned was that not everyone is as blessed as us her in the United States and that all these problems we see in our lives here are so small compared to other people in different countries. The research paper started with stating the facts and what was known about the invasion based on different sources. It compared and contrasted the different point of view that the Western sources provided in the new against what the pro-Russian news outlets were claiming. Then it dove deeper into historical and political events that happened on the Crimean Peninsula and why it was a unique scenario. The paper then discusses how the Ukrainian government and its people are completely disconnected and what the people need and what is definitely not what the government at the time was trying to do. This research made me feel extremely lucky to be living in America where we always complain about things but in the end realize that our “problems” are nowhere near the caliber of what other, less-fortunate people are experiencing around the world.

Another class that made me rethink my approach to people from different parts of the world was my Religions of the Far East course. This course taught me that there are much more ways that people view concepts such as time and life and nature than I have ever thought about. This made me really think about my approach when I talk and discus different subjects with people of different cultural backgrounds. I also gained a new insight and respect on why and what other people of a different background than me believe and idealize. This class even made connections to my major in ways I never thought of. For example, the East views time as circular and repeating while the West’s concept of time is usually very linear. However, in Quantum Mechanics time is much more fluid and much closer to the Eastern concept of time. It can be very relative and slow down unlike the traditional Western concept of time being ridged and chugging along no matter what is going on in the world around it. Overall, the different concepts and cultures that my college experience introduced me to really helped me widen my gaze and realize that different people see the world in very different ways. This also allowed me to come up with new understandings of different things thanks to my widened perspective.

**Ethical Reasoning**

I did not really think much of ethics directly before this assignment but looking back, I see how my knowledge and inner growth on ethics has slowly evolved from someone who does not care about what is right as long as it benefits me to someone who tries to think of others before himself. Ironically the class that really allowed me to evolve and grow my ethical reasoning was not a religious course or one designated with an “E” but instead it was Contemporary Literature. This class had us read books and literature by authors who wrote in the past few decades and most of who are still alive. The most important thing I learned from this course was that all actions have consequences and that I, as an individual, need to be extremely cautious of what I say or do to others around me. For the course we had to write reflections on the books we read and the one book that really gave me an ethical dilemma was *Fight Club* by Chuck Palahniuk (Supporting Item #7: Reflection to *Fight Club*). In the reflection I talked about how the main character is a schizophrenic and insomniac and has an alter ego named Tyler Durden. The alter ego is presented as a sort of rebellious and politically active person who wants to save the world. The ethical dilemma for me was that while saving the world is a noble cause, the way Tyler was going to do it was by destroying the world so that it can recover. This forced me to consider my self and our countries stance on many things, such as peacekeeping in the world. We want to achieve peace, but we try doing that by fighting an actual war for peace. The lessons I got out of this was that I need to make sure that what I use to achieve my goals in life must be fair and social accepted. That is one thing that prevented me from cheating in college. While it would have made life infinitely easier at the time, it would have been unfair to the other students around me and would have been counterproductive in the long run where I would have never learned anything from college even though I had a diploma that said I did.

Another course that also presented an ethical situation was Christian Perspective on Violence and Peace. This course mainly focused on Christianity and its view of warfare, violence, and peace and how those views progressed and evolved over time. This also forced me to think really hard about what position I would personally take and honestly, the course left me with more questions about violence and when, or even if, it is acceptable or ethical.

Overall, my college experience was much more than I ever imagined or bargained for. It taught me so many new ideas besides the Applied Physics I thought I was studying. College also forced me to widen my perspective and recognize that the world is much more different and diverse than I always thought and perceived it as. I am immensely grateful to all those Professors and fellow students who shared this life altering period in my life with me, and I honestly wish that every person could experience such an important event in their life. This will allow more people to understand each other and make the world a much better place to live in.