# Cumulative Reflection


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## Introduction

My electrical engineering education at Iowa State University has given me not only the technical skills required to be a knowledgeable engineer, but also the soft skills to make me a strong professional in my field. I've learned how to adapt, work as a team, solve complex problems, and have turned myself into a motivated lifelong learner. I've embarked in several journeys along the way including internships, on-campus jobs, and personal projects that have shaped me to be the motivated engineer I am today.

## Embracing the Bigger Picture

The diverse educational experience I've been a part of the past few years has fostered my ability to apply my knowledge in professional settings and understand responsibilities to my team and my employer. Working with my peers for semester-long projects mimicked future professional projects where I will be working with a team that relies on each other. I understand how to navigate effective communication, recognize my strengths and weaknesses, and work as a team player. These skills are essential in professional settings, as each team member has a responsibility to understand their role and work for the benefit of the team.

## Beyond the Classroom: Tapping into the Richness of Resources

As I embarked on my junior and senior year at Iowa State, I found my coursework became more in-depth and rigorous. Using only class materials was no longer sufficient to maintain my high grades. I started a job at the Iowa State Electronics and Technology Group (ETG). I was able to learn more about the inner workings of each lab and my boss gave me projects that helped me become more proficient at applying my classwork in real-life situations. My boss at ETG provided encouragement and insight into the career outlook of an electrical engineer, ultimately helping me secure two different internships.

## Embracing Lifelong Learning Beyond the Classroom

Securing internships at Novelis and John Deere was my largest obstacle throughout my Iowa State career, and it would not have been possible without the career fairs. The amount of time and preparation I put into preparing for elevator pitches, phone interviews, and in-person interviews was significant. The process of applying and accepting failure has given me fortitude and taught me to persevere, skills that will last for decades. The internships I accepted were outside of my targeted area of EE, and because of this, I have a more diverse and well-rounded skill set. I am more confident in my ability to push past any unforeseen challenges regarding securing a job or hitting roadblocks in my work, as my mentors have taught me how to work through those problems.

**Pioneering Growth Through Adaptation**

Since many of the projects I work on at ETG directly relate to the content I learn in my course work, I am able to apply the knowledge I've spent so much time studying and develop real-world skills. I often face a challenge that seems familiar, but it involves a topic I learned in a previous semester. These kinds of challenges reinforce my understanding of the topic by showing me how to utilize it to solve engineering problems. While I can't recall all the information presented to me throughout my course work, I now have the notes and resources to find that information and utilize it throughout my career.

**Crafting a Narrative of Growth**

If I could change my undergraduate journey, I'd likely start a job at ETG my freshman year. After starting my job at ETG at the beginning of my junior year, my educational experience completely shifted. The job changed my perspective on the content I was learning and kept me motivated to keep pushing forward, even when the coursework became overwhelming. It gave me glimpses of what I could do with my education, and that would have benefited me freshman year.

**A Glimpse into the Acquisition of Knowledge**

A recent engineering topic I have embraced is microwave engineering. I am currently enrolled in the Microwave Engineering course and am fascinated by this field of EE. Though we are less than halfway into the semester, I have already gone through the journey of developing an interest in the topic, struggling to comprehend the topics, spending the time to understand them fully, and now being comfortable with the topics. Getting to this point required me to put my head down in the material and do my own research to understand how and why the engineering strategies in microwave engineering are used. Without my inherent curiosity in this topic, I would not be able to understand it the way I am starting to now. This class has done an excellent job of presenting the theory and demonstrating in lab how to implement it in a real-world case with physical hardware.

**Transformative Applications of Knowledge**

My microwave engineering course has done something I feel other courses have failed to do: clearly demonstrate how the theoretical knowledge learned in lecture is applied in real applications. This course explains the techniques used in microwave engineering, and at the same time shows us in lab how to apply these techniques. The project we are working on now is an amplifier using a transistor. It needs to be impedance matched and stabilized to operate at frequencies as high as 12 GHz. After we design and simulate the circuit, we'll design and fabricate the board to show how our simulations translate to real hardware. Since there is no single solution to a design like this, it requires a level of creativity to create a device that functions as expected and can be used reliably.

**Evolution of Learning Strategies**

My learning strategies have changed noticeably through my college career. In my general engineering courses, such as math and physics, I could simply memorize steps and equations to solve a problem that was designed for a classroom. Now, in my more specialized classes, the problems are more similar to real-world problems. This means the problems I face require a true understanding of the topic and some creativity to design a solution rather than regurgitate an

answer. In practice, this has made my learning and studying habits involve less memorizing facts and more practicing applying the knowledge to solve problems.

**The Path Ahead: Continuous Development**

As my college engineering journey comes to a close and I prepare to accept an offer for a full-time position as an electrical engineer, I'm preparing myself to use the knowledge and skills I've obtained to learn even more from the professionals I'll be working alongside. I am in a position where I am able to contribute to a team of engineers, while also having enough experience to ask the right questions to learn from that team. I will continue to work on personal projects to explore engineering topics that are new and interesting to me.

**Conclusion**

The many obstacles I've faced and overcome during my time as an electrical engineering student have shaped me to be a knowledgeable and well-rounded engineer. I am very satisfied with my experience at Iowa State and am confident in my ability to contribute to a team in a professional environment. I've developed a love and appreciation for this field which has turned me into a motivated lifelong learner.