From Childhood Dream to University Journey: My Path to Becoming a Chemical Engineer

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Abstract
From an early age, children harbor vivid dreams of their ideal future professions, fueling their aspirations and shaping their journey toward fulfilling careers. A dream that starts prior to school and grows along the journey. In this paper, I delve into the intricate factors that shaped my aspiration to become an engineer and how they molded my professional engineering identity. I adopted autoethnography and narrative inquiry approaches, delving into personal experiences and employing qualitative research methods. Through this exploration, I uncover the profound impact of societal perception theory and social learning theory on shaping my career aspirations from an early age. Reflecting on my own journey as a chemical engineering student, I trace my fascination with science back to my childhood and unveil the pivotal decision to pursue chemical engineering. Within this paper, I extensively discuss the educational environment, teaching methods, and familial influences that played crucial roles in shaping my chosen path. Furthermore, I tackle the challenges encountered throughout my university education, encompassing academic hardships, technical assessments, and the abrupt transition to online learning necessitated by the COVID-19 pandemic. Despite these obstacles, my unwavering passion for chemical engineering was revitalized through hands-on application and interdisciplinary courses. This study places great emphasis on the significance of comprehensive engineering education in fostering the development of essential professional skills, critical thinking prowess, and problem-solving abilities. It serves as a testament to the multifaceted nature of engineering education and its profound influence in shaping an individual's engineering identity. Through this meticulous exploration, I aim to provide valuable insights into the underlying dynamics that drive individuals towards engineering as a profession and contribute to the broader understanding of engineering education's transformative power.

Keywords: Chemical engineering identity, Engineering education, narrative inquiry, self-study.

Introduction

In today's rapidly evolving world, learning has become an indispensable part of our lives. It not only provides us with new knowledge and skills but also significantly impacts our well-being. Learning is a continuous process that allows individuals to expand their knowledge and develop new skills. It enables individuals to have intelligent conversations with others, and if one has learned the necessary business skills, they can be a great asset to a company. Engineering, in particular, is a field that plays a critical role in the development of countries. The importance of engineering in developed countries cannot be overstated. The development of advanced technologies, infrastructure, and transportation systems are all dependent on the expertise of engineers. Therefore, learning engineering has become increasingly important for the continued growth and progress of developed countries.

Engineering education plays a crucial role in shaping our world by addressing global challenges such as climate change, renewable energy, and healthcare. Through engineering, new technologies and systems can be developed that can make our lives easier, healthier, and more sustainable. Thus, engineering education is vital for preparing future generations of professionals who can solve complex problems and lead us to a better future.

Engineering education is important in shaping the engineering identity of an engineer. It provides individuals with a foundational understanding of engineering principles, theories, and practices, and equips them with the skills and knowledge necessary to solve complex problems. Through education, engineers learn to approach problems systematically and systematically assess different solutions, which helps to shape their engineering identity. Engineering education also exposes individuals to various subfields within engineering, allowing them to explore different areas and develop a sense of where their interests and strengths lie. This exploration can help shape an individual's engineering identity by allowing them to identify their passions and pursue their goals.

However, compared to most majors, engineering students have a higher attrition rate. In fact, according to some estimates, 50% of engineering majors switch their majors or leave school early (Belasco, 2021). Additionally, some engineering graduates may choose to pursue careers in fields unrelated to engineering,

while others may face difficulty finding employment in their field of study.

As a developed country, Sustainable development is a major goal for Saudi Arabia, as reflected in its Vision 2030 plan, which aims to achieve sustainability goals and accelerate the energy transition (UN, 2023). Saudi Arabia is a country that heavily relies on the oil and gas industry, making chemical engineering a vital field in the country's economy. Chemical engineering has been an integral part of the country's development plans, and the Saudi government has made significant investments in the field, including the establishment of world-class universities and research centers. In recent years, the Saudi government has also been working to diversify its economy, and chemical engineering has played a crucial role in achieving this goal.

Engineering students embark on a learning journey that involves navigating various challenges and complexities. Throughout this journey, they encounter obstacles in both their academic pursuits and interactions within society. These various issues as shown in Figure 1 significantly affect and shape their choices and decisions in developing their engineering identity. In this paper, I will delve into my personal journey as a chemical engineer where I began my education in elementary school in Saudi Arabia and went on to pursue a degree in chemical engineering in Malaysia including the differences in educational systems and the pursuit of professional development.

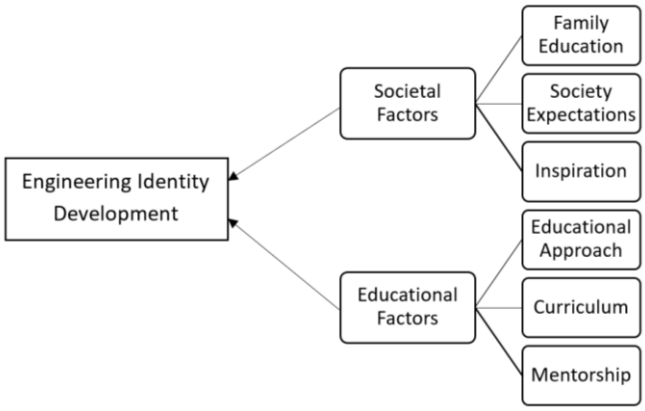

Figure 1. Conceptual framework for the relation between different factors and engineering identity development.

Methods

The primary objective of this paper is an attempt to answer the question "what are the factors that influence the person to have the desire to be an engineer and how it translates to developing a professional engineer identity". The paper discusses the factors starting from the society's dictations to the classroom experiences. The methodology employed in this study is divided into two parts, autoethnography approach to analyse the background and societal factors and the narrative inquiry approach to analyse the learning journey from high school to graduating from university. Both methods fall under the qualitative research paradigm.

Autoethnography, a relatively new research paradigm, uses reflective narratives to illuminate the researcher's personal experiences in order to examine cultural ideas, practices, and the social experiences that shape our identities (Wall, 2008). In order to demonstrate their understanding and the significance of using autoethnography as a valid and significant research technique, the writers use their own stories throughout their study. However, the analysis of experience as understood through a narrative is the focus of narrative inquiry, a relatively new qualitative methodology. It is a means of contemplating and researching experience. Throughout the course of the inquiry, narrative inquirers reflect on experience narratively (Clandinin et al., 2010).

In narrative inquiry, stories are useful in guiding the researcher towards a deeper comprehension of phenomena. When engaging with narrative inquiry, we take on the role of co-participants to co-create the knowledge with the participants across specific locations and times (Pino Gavidia et al., 2022).The story is how we make sense of the world, and narrative research allows us to understand, describe, and act within the context of the storyteller's experiences (Ntinda, 2019). Thus, the study of narrative focuses on how people live in the real world. This idea is expanded upon in educational research to see education and research as the creation and reconstruction of stories, either from personal experiences or through group participation. Thus, learners, teachers, and researchers are all storytellers and characters in their own or other people's stories (Zakaria, 2021).

To write this paper, I have reflected on my own journey from elementary school to university to my short experience in the industry discussing all factors and the turning points in order to find an answer for this research question "what are the factors that influence the person to have the desire to be an engineer and how it translates to developing a professional engineer identity". I review my experiences through the lenses of autoethnography, narrative inquiry tracing the effects and changes in my performance in university and the projects I was involved in. I also referred to my diaries through the years, reflection reports at the end of each course, learning portfolio, and internship logbook in order to analyse my overall engineering identity development.

The significance of my study lies in its exploration of the intricate relationship between societal and educational factors in shaping engineering identity. By delving into my journey, this paper sheds light on the complex influences that contribute to an individual's development as an engineer, thus providing valuable insights and effective engineering education and professional growth.

Findings and Discussions

Growing up

Being a leader in the petroleum industry, Saudi Arabia has gone through a lot of changes and revolutionary developments through the years. From the early days of the huge petroleum sea discovery in the eastern area in 1938, engineering passion has grown among people living in the country. As a child of an educated family, my interest in science and pursuing a medicine or engineering dream came from an early age. The first question I was asked on my first day in first grade was "what do you want to become in the future?", all the class said one of these three answers, a pilot, a doctor, and an engineer, and I remember my answer was "a pilot" which changed immediately after my unpleasant first flight. Societal Perception Theory is evident in the early perceptions of careers such as being a pilot, doctor, or engineer that the students in the first-grade class mentioned. The societal perception and prestige associated with these jobs influenced the answers given by the students, despite not having a deep understanding of the fields at such a young age. This reflects how societal norms and perceptions can shape one's early career aspirations (Aronson et al., 2010).

I grew up in a family where education is a priority and I was taught the first verse in Quran revealed to prophet Muhammed -peace be upon him- was "Read, ˹O Prophet,˺ in the Name of your Lord Who created" (Quran 96:1). My grandfather was a doctor in Islamic studies and had a huge influence on my father and uncles to pursue masters and doctorate in Islamic studies too. My father graduated from a highly reputed Islamic university, so I was surrounded by books and in a research and learning environment for many years growing up and that was my first trigger to consider education as a path of my life and a must. The Social Learning Theory is shown by the influence of the family environment on my future plan and decisions (Bandura, 1971). Throughout my fathers' tremendous library, there was not any science-related book to read since it is not related to his field except an old organic chemistry book. This enthusiasm to discover the unknown of science was enough for me to establish my passion and voice out my desire to become an engineer.

"Acquire knowledge, and learn tranquillity and dignity."

— Umar ibn Al Khattab

As I reflect on my journey, I can see how Societal Perception Theory and Social Learning Theory have played a role in shaping my choices. The societal perception and lack of exposure to science-related education during my primary and secondary school years have influenced my path. The aura and perceptions associated with subjects like physics and chemistry initially sparked my curiosity and desire to learn more about these fields, as evidenced by my questions to neighbours about these subjects before entering high school. However, the limited availability of science-related education in my early schooling years weakened my passion and desire for engineering. This serves as a reminder of the impact that societal perception and educational environment can have on shaping our career choices.

The high school education system in Saudi Arabia is the first and major station for a student to decide the direction of his future education. During my days in high school, two paths were the choices for all students. The first path is for students with theoretical study preferences like philosophy and language education, and the other path is for students with practical education preferences like medicine or engineering.

The second path was my choice where I picked my first tools for my following engineering education venture. The tools of an engineer are acquired through the years. The analytical and critical mindset is something from an early age. However, practical and technical skills are acquired through education and school. Engineering accreditation agencies are united in their opinion that engineering education must support the development of professional skills in addition to technical and scientific skills (Picard et al., 2022). My first class in chemistry in high school was the pivotal point that decided my future. The chemistry teacher followed a direct teaching method by writing the full lesson as nested points and titles. The chemistry lesson was written down while being explained in a very clear and understandable fashion. Scientific teaching involves active learning strategies to engage students. Active participation in lectures and discovery-based laboratories helps students develop the habits of mind that drive science (Handelsman et al., 2004).

This start of high school made chemistry class my favourite and got the complex details of chemistry ahead of the fascinating concepts of physics. The education method was the main reason as it combined the explanation – mental aspect- with the writing – physical aspect – and the combination of these two eased the learning journey. This method illustrates the Science Writing Heuristic (SWH) which is a framework developed by Carolyn Keys, Brian Hand, Vaughan Prain and Susan Collins that promotes critical thinking and scientific inquiry in the classroom (Keys et al., 1999). It is a structured approach to engage students in the process of scientific inquiry through writing. This method is effective because it includes initial engagement, exploratory talk, pre-writing, inquiry, and potentially discussion and revision (Stephenson et al., 2016).

"Writing in science is not only for communicating with others; it is also a tool for learning that supports scientists and students alike in clarifying thinking, synthesizing ideas, and coming to conclusions."

— Karen Worth et al., The Essentials of Science and Literacy

As we get closer to graduation from high school, my desire to continue my study in the chemistry field has grown, but at that time my concern was that I would end up being a lecturer and that is not something as prestigious as being an engineer as I feel in my society. However, I came to the decision of pursuing chemical engineering since it combines both chemistry and engineering as I expected from the name. but I was not sure 100% about what I will learn chemical engineering and if that is my best choice.

University journey

As I graduated from high school, there were no doubts or clouds about my future goal as I was confidently choosing to be a chemical engineer. Although it is true that chemical engineers are comfortable with chemistry, they use their understanding of the subject for much more than merely creating chemicals. However, my understanding of chemistry and the joy of the followed teaching method combined were the reason behind my growing love for chemistry and immature decision at that time, which might be not the case for others.

I started looking for reputed universities in chemical engineering and I ended up enrolling at Universiti Teknologi Malaysia (UTM). My diary for the first day in college says *"Today was my first day as a chemical engineering student at university. I felt a mix of excitement and nervousness as I stepped onto campus, eager to embark on this new chapter of my academic journey. Yeah, I am living my dream. Let's rumble".*

During my first year in college as a chemical engineering student, I encountered numerous challenges that impacted my academic journey. One significant hurdle was the level of hardship I faced, as I had started in the second semester and was unable to fully follow the academic plan. This created difficulties in catching up with the coursework and adjusting to the new environment. Additionally, the unprecedented technicality of the tests and assessments caught me off guard, resulting in lowered confidence in my abilities as a student. The complex and rigorous nature of the chemical engineering curriculum compounded with the technical challenges posed by the assessments, which made it challenging to keep up with the pace of the coursework. Despite these obstacles, I persevered and sought support from professors and peers to overcome the difficulties and build my confidence as a chemical engineering student.

The transition between being a "mostly-receiving" student in high school to a "mostly-searching" student in college was an enormous shock personally that led to a drastic change in my learning mindset. Even though going to college is normally the next step following high school, there are instances when they couldn't be more different. High school gives you a glimpse of what being an adult will be like from childhood to adulthood. Conversely, college gives you the opportunity to totally take control of your time, responsibilities, and future (Randolph, 2022).

The mindset transition produced some important skills a chemical engineer should have, like responsibility and accountability. These two traits are the foundation of the work of a chemical engineer's personality who works on dangerous projects and deals with harmful materials at times. In my first year, my experience in chemical engineering was not pleasant as I was shocked with the difficulty of some courses which made me rethink and question my choice. My confidence in my ability to ride the waves coming my way was diminished and I was low to 20% confident to be a chemical engineer.

The challenges faced during my first year as a chemical engineering student have taught me valuable lessons. I have learned the importance of perseverance in overcoming hardships, the significance of seeking support from professors and peers to navigate the unfamiliar environment and technical assessments, and the need for adaptability in adjusting to the fast-paced coursework. Taking responsibility and being accountable for my own learning journey has empowered me to develop essential skills. Through self-reflection, I have grown personally and recognized the value of resilience, seeking guidance, and embracing change. These lessons will continue to guide me as I progress in my academic and professional endeavors in the field of chemical engineering.

In my second year of college, I had the opportunity to study a more diverse range of courses in different fields, such as analytical chemistry, numerical methods, and material engineering. These courses played a crucial role in boosting my confidence as a chemical engineering student. However, it was the transport process course that truly ignited my passion for the field. For the first time, I felt like I was learning about real-life phenomena and seeing the direct application of chemical engineering principles. This connection to the practical aspects of the field made me fall in love with chemical engineering all over again which embodies the self-efficacy theory (Gallagher, 2012). It was a turning point that helped me regain my confidence and reaffirmed my commitment to pursuing my passion in chemical engineering.

Unfortunately, during my second year in college, the COVID-19 pandemic struck, leading to a sudden shift in the learning methods from in-person classrooms to completely online. This transition had a significant impact on my academic experience as a chemical engineering student. I found it challenging to adapt to the virtual learning environment, which hindered my understanding of some courses. The absence of face-to-face interactions with professors and peers, as well as the limitations of online learning tools, made it difficult to fully engage and participate in class discussions which can be explained by transactional distance theory (Weidlich et al., 2018).

The theory states that this separation causes unique learner and instructor behavioral patterns. The separation between students and teachers has a significant impact on both teaching and learning. Separation creates a psychological and communicative barrier that must be crossed, creating a chance for miscommunication between the learner's and instructor's inputs. The transactional distance is this area of psychology and communication (Moore, 1993). As a result, my passion for learning, which was previously fueled by the dynamic classroom environment, was affected. Despite the challenges, I persevered and adapted to the new normal of online learning, seeking additional resources and support to overcome the obstacles posed by the pandemic and continue my academic journey in chemical engineering.

The reflection for numerical methods and optimization course which was one of the main courses in my second year gives a brief of the unusual experience of learning transition during the pandemic. "*Reflecting on my experience learning numerical methods in person for a few weeks before transitioning to online teaching, I found the shift to be both challenging and transformative. The in-person sessions allowed for engaging discussions and hands-on practice, fostering a deeper understanding of the subject. However, the online format presented unique hurdles, requiring adaptability and self-discipline to navigate the virtual lectures and complete assignments effectively. Despite the initial difficulties, I learned valuable skills in independent learning and digital collaboration, proving that resilience and determination are crucial in the face of unexpected circumstances."*

By my third year, I was introduced to a wide range of courses that expanded my understanding of the role of chemical engineering beyond the technical aspects. Courses such as chemical reaction engineering, engineering economics, entrepreneurship, unit operation, electrical technology, separation, and plant design provided me with a comprehensive knowledge of the field. As I progressed through these courses, I began to see the connections between different concepts and how they applied to real-world situations.

This newfound understanding translated into a successful internship experience during the summer of my third year, where I was able to apply the knowledge and skills I had gained in practical engineering projects. Internship was the shifting point in my journey that made me sure and 100% confident to follow the practical and industry and become a chemical engineer. I managed to land a job as a chemical engineering intern in a polymers company in Saudi Arabia named "Saudi Top Plastic Factory". The internship journey was the measuring point of the learning journey in chemical engineering and the checkpoint for the possessed and lost skills. I started to feel confident in my abilities as a chemical engineer and began to see the bigger picture of how my education was preparing me for a future career in the field.

My third-year journey have imparted several valuable lessons. Through exposure to a diverse range of chemical engineering courses, I expanded my understanding of the field beyond its technical aspects. This broadened perspective allowed me to see the real-world applications of the concepts I learned, reinforcing the practical relevance of my education. A transformative internship experience provided me with hands-on opportunities to apply my knowledge and skills, instilling a sense of confidence and certainty in pursuing a career in chemical engineering. This industry exposure highlighted the practicality of the field and solidified the connection between my education and future career aspirations. Overall, I have learned the importance of comprehensive understanding, practical application of knowledge, gaining confidence through experience, appreciating industry exposure, and establishing a clear link between education and career goals. These lessons have shaped my academic journey and fueled my passion for excelling in the field of chemical engineering.

In my fourth and final year of college, I was determined to pursue my passion for chemical engineering and further develop my skills and knowledge. I recognized the importance of continual growth and skill development, which led me to take elective courses in polymers and downstream processing to expand my expertise in different areas of the field. These courses not only boosted my confidence but also assured me that I possess the capabilities to adapt to a rapidly evolving field. Additionally, I understood the value of specialization within chemical engineering, realizing that honing in on specific areas of interest can set me apart and enhance my career prospects.

The highlight of my college journey was the completion and presentation of my plant design project, which showcased my ability to integrate various concepts and apply them to a real-world engineering problem. This experience reinforced my belief in the power of interdisciplinary thinking and solidified my passion for chemical engineering. Furthermore, by participating in the undergraduate research conference and presenting my final year project, I had the opportunity to enhance my technical and soft skills, adding to my sense of accomplishment and readiness for a future career in the field. Overall, these experiences and lessons have provided me with the necessary building blocks to confidently pursue a fulfilling and successful career in chemical engineering.

Internship Journey (practical experience)

My first day as a chemical engineering intern was a typical day starting a new job where I had to finish paperwork and was introduced to the safety manager who took me around the factory and explained the

facilities. From the first day, I was faced with the reality in the first meeting where I had to read the daily schedule of the factory and the instructions for me as a practicing engineer. It was fascinating walking around machines and equipment I have been studying for five semesters. Not long until the industrial manager came and took me to the production line and was asking me a few questions during our chat I was able to answer them, and that was a moment of confidence boost that set the optimistic tune for my practical experience.

The instant increase in my confidence after answering the questions is related to the self-awareness theory which provides insights into the relationship between answering questions and confidence. According to this theory, when we compare ourselves against our standards of correctness and find alignment between ourselves and our standards, we experience a sense of validation and self-affirmation that can boost our confidence. Answering questions correctly can provide such a sense of validation and affirmation, leading to increased confidence (Carden et al., 2022).

During the 12 weeks of my internship, I was responsible for few tasks. Daily production management, laboratory assistance, and process engineering. The diversity of the tasks was a key to applying a wide range of my knowledge I learnt in university classrooms. The management subjects are well used in production management where details of imports and exports are recorded and the track of weekly production must meet customers' needs. This aspect of chemical engineering is the furthest field from the technical practices and is more related to management and business departments. However, it ignites the sense of responsibility and builds my manager character as a practicing chemical engineer. Many times, I was called by the management where I was asked about the track of production and an update must be provided to keep the work and production going. Figure 2 (b) shows me performing the TGA analysis for a raw material before processing.

Figure 2. (a) my first week in my internship. (b) performing TGA analysis.

The production work was the easiest in my internship since it is done from a comfortable office without moving around the production area most of the time. However, the other tasks are more challenging and require pure chemical engineering skills and knowledge. Until this point, I did not have any idea about the range where I operate and how I can implement my knowledge but the daily routine and the discipline it requires were enough to hook me up and make me an enthusiastic intern in a routine work environment.

The practical experience during my internship can be related to Kolb's learning cycle which describe the process of my learning in all projects and experiments. Kolb's learning cycle is a model describes the experiential learning process and involves four interrelated modes: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Figure 3)(McLeod, 2017).

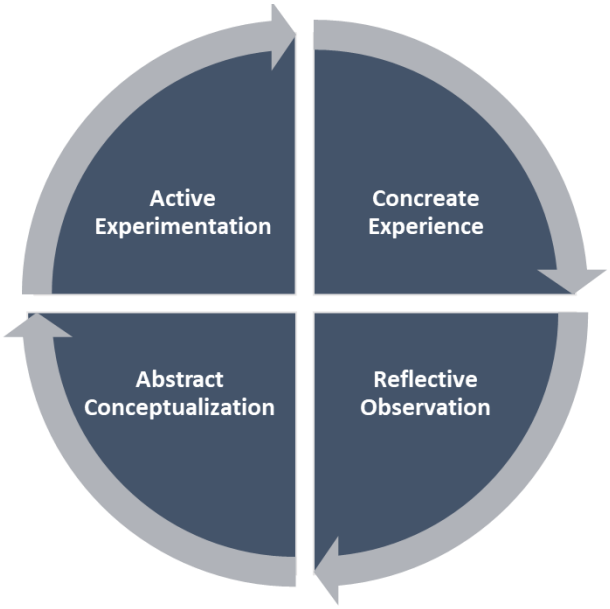

Figure 3. Kolb's learning cycle

To clearly demonstrate the Kolb's learning cycle in my internship, I selected the first practical experiment I did in the laboratory. the experiment was to measure qualitatively and quantitatively the emissions from a material that will go through heating and melting process. The first stage of Kolb's learning cycle is "concrete experience". Prior to my internship in university, my experiences with heating materials were in green experiments where the materials used are safe. So, the sense of danger had not been experienced dealing with such materials and the objective of the heating processes were to for the sake of heating only. Adding a new measured factor to a familiar experiment created the sense of the first time. As a result, I was more conscious of the details of the experiment due to the unfamiliarity of the objective and the caution because of the precise and accurate data that must be acquired.

Next is the reflecting observation. After finishing the task, I would record the observations and the new findings for personal knowledge or further research. Every time after the experiments I recall what I have learned and refer to the logbooks of my laboratory courses and discuss with my colleagues in order to get more explanation for the experiment. For example, during the emission experiment, I faced an issue with setting the heater to get a specific temperature and there was a fluctuation in the temperature measured. This affects the accuracy of the data. Fortunately, my supervisor helped me fixing this issue with a brief explanation. However, I remember calling a friend who had more experience regarding laboratory procedures and he was aware of my problem and gave me instructions and on the other hand I described to him the device I am using from another company. So, the reflection and discussion led to the two of us exchanging knowledge and learning new things.

The third stage of Kolb's learning cycle is Abstract Conceptualization, and this is when I attempt to interpret what happened. I accomplish this by using what I already know, by using concepts I'm already familiar with, or by talking with my colleagues about potential theories, concepts, hypotheses, or approaches in an effort to make a conclusion about my experience. I will write the concepts I learned and connect it to the potential outputs and the scenarios of different cases and what can be controlled and modified for a preferred output. As I do the experiments repeatedly, the concepts become more understood and the divergence from the expected output decreases. The analysis, discussion and recommendations as documented will help with further improvements and better understanding. For example, in this experiment I faced the issue of me being unexperienced in recording and analysing the data instantly in a systematic manner. The reason is because I need to use my own ideas in forming the files and recording the data where in university you need to record the data in a pre-prepared files which makes you unaware of this part of the whole process.

Finally, the Active Experimentation stage. In this stage, learner tries out new approaches to solve problems or achieve goals based on the insights and knowledge gained from the previous stages. This stage involves taking risks, testing hypotheses, and making adjustments based on feedback and evaluation of results. In view of this, I repeated the experiments many times and conducted different experiments where I applied the knowledge I gained. So, a noticeable improvement in my performance with new knowledge and a different window of critical thinking and problem-solving skills.

Reflecting on my days in the internship, many skills I acquired in classrooms were the reason to have a successful and motivating experience to pursue practicing chemical engineering. Technical and communication skills, time management, and adaptability helped me to indulge and dive in the practical field. The key to solve the challenges I faced were through applying these skills efficiently and have the self-confidence where it can be built through the daily tasks and integration and application of previous knowledge.

After 12 weeks, I left the company to continue my study. This eye-opening experience really served me positively and charged me through the remaining of my learning journey. The next semester I started working on my final year project with completely different view and passion due to the practical experience I had during my internship. My final year project was in biodiesel production from palm fatty acid distillate using sulfonated sago pith waste catalyst. I put a lot of work and my time doing the experiments was enjoyable since my aspiration to get more knowledge and learn more about chemical engineering have gone to different highs. I worked hard in this project and I managed to achieve the best undergraduate research award in the undergraduate research conference 2022.

Conclusion

Looking back through my journey from being a dreaming kid to being a chemical engineer, it can be concluded that there are many societal to personal factors that dictated my aspirations. and the stations I went through and the two complete different parts of the world that I lived in and learnt from shaped me the way I am now. However, developing an engineering identity involves a combination of personal traits, education, and practical experience. Seeking out engineering experiences, such as internships, research projects, or volunteer work, can provide a better understanding of what engineers do and allow for applying knowledge to real-world problems. Ultimately, constructing an engineering identity involves a lifelong commitment to learning and growing as an engineer, staying up to date with the latest advancements in the field, and striving to make a positive impact on society through engineering. I am grateful for the journey and hope that sharing my professional development as an engineer might at least help other aspiring engineers.

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