Engineering Practice Reflection

Ullman (2017, p. 164) identifies six key levels of reflection ranging from the lowest level, the mid-level , to the deepest level:

i) **Recount/Description of an experience:** 'This category captures the subject matter of the reflective writing'

ii) **React /Feelings:** 'Often, the feeling of being concerned, having doubts, feeling uncertain about something, or frustration are reasons for a reflective thought process. However, feelings such as surprise or excitement [may] also [be] mentioned'

iii) **Personal beliefs:** Reflection is often personal. 'This is about one's assumptions, beliefs, the development of a personal perspective, and the knowledge of self'

iv) **Recognising difficulties**: 'Expressing an alert, critical mindset is an important part of reflective writing. A critical stance involves being aware of problems and being able to identify or diagnose such problems'

v) **Perspective: Relate/research**: 'The writer considers other perspectives. For example, the perspectives of someone else, theory, the social, historical, ethical, moral, or political context'

vi) **Lessons learned and future intentions:** 'Retrospective outcomes: Descriptions of lessons learned, better understanding of the situation or context, new insights, a change of perspective or behaviour, and awareness about one's way of thinking. Prospective outcomes: an intention to do something, and planning for the future'

Ullman, T. D.,2017, Reflective Writing Analytics - Empirically Determined Keywords of Written Reflection. In: LAK '17 Proceedings of the Seventh International Learning Analytics & Knowledge Conference, ACM International Conference Proceeding Series, ACM, New York, USA, pp. 163–167.

Reflection: Sustainability in Engineering

During my internship I was involved in designing a nozzle housing system for a client. The design allowed the nozzle to move in multiple directions and shut off automatically using servo motors and an Arduino. The main goal was to make the system more accurate and efficient while reducing the need for manual handling. The solution worked well and the client was satisfied which made me feel proud of the outcome.

However after reflecting on it I started to feel a bit conflicted. Our design reduced the need for workers to be involved in the task which meant that fewer people were required in the process. While this helped improve consistency and performance it also raised questions for me about how engineering choices affect the people who work around them.

Before this experience I mostly focused on whether a design worked or solved the technical problem. I believed that automation was always a positive step forward. But through this project I realised that solving one problem can sometimes create another especially when it comes to the social side of engineering.

It was a reminder that engineering does not happen in a vacuum. According to Engineers Australia's code of ethics engineers should consider sustainability not just from an environmental perspective but also in terms of long-term social impact. I now see that responsible engineering involves thinking about how people are affected by our work.

In the future I want to take a more balanced approach. Efficiency is important but so is the wellbeing of the people who interact with what we design. This experience helped me understand that sustainability includes both systems and people and I want to be the kind of engineer who keeps both in mind.

Reflection 2: Global and Intercultural Practice

As an international student studying engineering in Australia, I have often found it challenging to blend in with domestic students especially during group assignments. While language has never been a barrier for me since I have been learning English from a young age, I noticed that some students are hesitant to work with someone from a different background. This made me feel a bit isolated and unsure of how to approach teamwork in the early stages of my degree.

I used to believe that as long as I communicated clearly and contributed well it would be easy to integrate into any group. But I have come to understand that group dynamics are also influenced by comfort zones and cultural differences. One time I was part of a group where everyone was welcoming and treated me with the same level of trust and involvement. That experience stood out to me because we not only completed our project successfully, but we also achieved a high distinction. I felt more confident and encouraged because I was given the chance to contribute equally.

This made me reflect on the importance of cultural awareness and inclusion in professional collaboration. It also helped me realise how my own actions can support others in feeling comfortable and valued in a team. In the context of engineering which is becoming more globally connected these soft skills are just as important as technical ones.

From this experience I learned how valuable it is to be self-aware and inclusive. In future projects I will take more initiative to create a respectful space where every team member feels heard. This reflection has made me more conscious of how I can contribute to a supportive and culturally respectful working environment.