Career for Chemical Engineering Graduates – My Personal Perspective

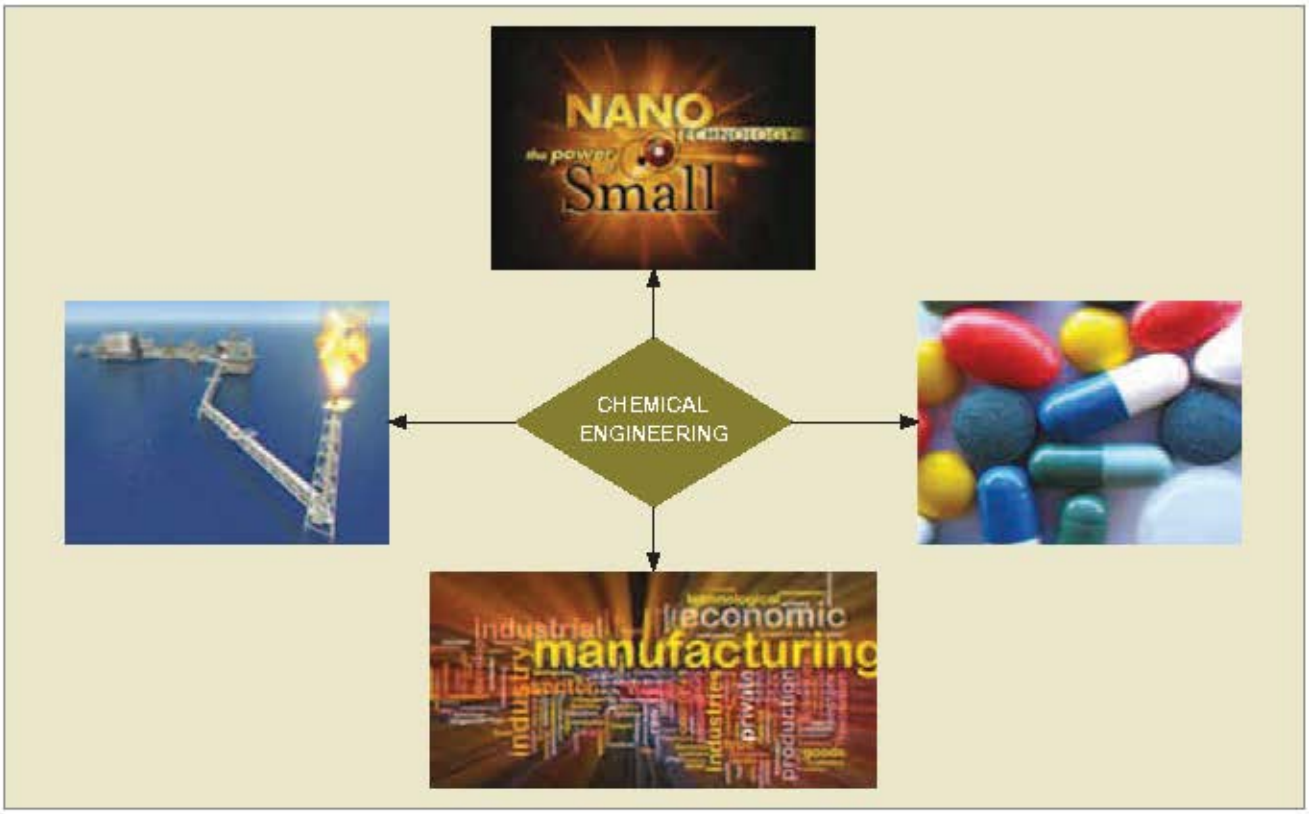
by Ir. Mohamad Anuar Ahmad

HOW many of us know what Chemical Engineering is all about when we fill up the university application form? Some of us may have applied because we have been told to do so, perhaps by our parents and relatives or teachers and seniors, etc. Some of us may have applied because we are interested in chemistry, physics and mathematics.

In my case, I applied for the Chemical Engineering programme because I was interested in the hydrocarbon and petroleum industry. At an education fair, I was attracted to a poster on the petroleum industry. There could be lot more other reasons why we have chosen Chemical Engineering for our further studies.

Some people feel that Chemical Engineering may narrow down our career choice upon graduation. On the contrary, there are lots more opportunities for Chemical Engineering graduates. These include jobs that can be filled by non-chemical engineers as well as those that are specifically meant for chemical engineers. In general, the choice of career is more dependent on one's own preferences and circumstances rather than the supply-demand curve. I have seen both cases and, to a certain extent, I have experienced them myself too. As a reader, you may ask, "how can it be partially?" Well, believe me, there are many similar cases with different individuals.

When a person graduates from a Chemical Engineering programme in university, he or she will apply for jobs that are more or less related to his or her area of study. As a new graduate, it is quite natural that he or she may apply to join a specific field that matches his or her area of expertise. However, we do not necessarily get what we want. So, a contingency plan must be in place so that we can act according to the circumstances. Even if you do join the industry of your choice, it still does not necessarily mean you will have the chance to be in the specific area of preference. For instance, I started my career in the oil and gas industry but as a graduate process engineer in fabrication yard. I then moved to an operating company and currently, I am with an engineering firm (we call it as "design house").



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Would you consider this a good or bad move, experience-wise? It really all depends on whether our career is progressing according to our plans and whether we know what we are doing. In my own career path, the areas of work (even when in different companies) are about the same, i.e. process engineering. However, there are cases where chemical engineers end up in project and services, or they deal with project management as a project engineer, performing tasks such as cost estimation, procurement, quality control and other jobs that do not deal with chemical or process engineering.

I have also seen chemical engineers end up as piping engineers, which is the main domain of Mechanical Engineering graduates. I should also mention that a career for chemical engineers in the oil and gas sector can also include working in sub-surface engineering and handling work related to reservoir engineering. In short, a career in chemical engineering in the oil and gas industry can be discussed as an independent topic because it's so wide ranging. As for the contributions that chemical engineers can make to this industry, what has been discussed so far is merely the tip of the iceberg.

Apart from the oil and gas sector, there are many more industries where chemical engineers can plan a career. These include petrochemical, bulk chemical, fertiliser, food and beverage, and many more. Roles for chemical engineers in these industrial sectors range from technical services, operation, planning, safety, etc. These roles may vary, depending on their position. For instance, in the technical service department, chemical engineers will be doing optimisation studies and supporting the operation team. Operation engineers, on the other hand, are in charge of performance maintenance for the plant to ensure that it operates as planned without problems, that it meets customer satisfaction as well as ensure supply meets demand. As a safety engineer, he or she would ensure that the plant is running at optimum safety standards.

Apart from working in the conventional work sectors such as oil and gas, bulk chemical industry, chemical engineers can also move into various consumer products industries. Among these is the food and beverage industry where chemical engineers can apply the various principles of Particle Technology to the manufacturing process as well as the packaging section. In addition, when production is to be up-scaled, chemical engineers can play an important role to ensure that the specification of the products is met. Just like in other industries, chemical engineers can also play the role of safety engineer to ensure production is maintained at the highest safety standard. Note that even though chemical engineers have to compete with non-chemical engineers (e.g. food technologies) to get hired in this industry, they do offer services that will improve the quality of the food products and the processes.

The pharmaceutical industry also offers good opportunities for chemical engineers. In some countries, Pharmaceutical Engineering programmes are offered to produce engineers in this specialised area. In Malaysia, I have met quite a number of chemical engineers working in pharmaceutical industry. They apply the fundamentals of Chemical Engineering principles such as mass and energy balances, mass and heat transfer, lab analysis, etc. in their daily work. The beauty of being a chemical engineer is that we are exposed to fundamental engineering principles which can be even applied to specialised area such as pharmaceutical engineering.

Another area where chemical engineers can largely contribute to the country is from the environmental perspective. Ranging from waste water treatment plants to air quality monitoring and solid waste management, chemical engineers can ensure that the waste produced from a production facility is properly treated before it is discharged into the environment.

I should also mention that there are many chemical engineers who choose to go into the research and development (R&D) sector, whether it is in the industrial, research or academic institutions. There are many emerging sectors where chemical engineers can contribute significantly, e.g. nano technology, biotechnology, software development, etc. We also find many chemical engineers

working in the authority bodies, as regulators and as educators in higher education institutions, etc. There may be some industries that I have missed out in my list here, but as long there is a requirement for non-specialised engineers, chemical engineers are always eligible for the job, especially new graduates and the graduating students in universities.

As for career choices, my advice to fresh graduates and graduating students is to be always realistic when deciding which sector you want to start your professional career. Perhaps a good way of seeking advice is to get involved with professional bodies such as The Institution of Engineers, Malaysia (IEM), or specifically The Chemical Engineering Technical Division (CETD).

There is also The Institution of Chemical Engineers, UK (IChemE) which is now collaborating closely with CETD to enhance the Chemical Engineering profession in the country. By being involved with these professional bodies, we will get to enhance our professional career. ■

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