

Promoting STEM and Engineering to Meet Demands of The Future



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The Institution of Engineers, Malaysia (IEM) is concerned about the decline in the number of secondary school taking up Science, Technology, Engineering and Mathematics (STEM). This will result in a decline in the enrolment for engineering courses in universities. The consequences are disastrous as it will mean there will not be enough engineers to implement and maintain development projects in the country. This will cause the development of the nation to stagnate.

Countries which want to achieve developed status and maintain that status, will require significant numbers of engineers. The "Ratio of Engineers to Population" is used to benchmark whether a country has enough engineers for development. Developed nations such as the United Kingdom, France, Canada and Germany, have a ratio that varies from 1:75 to 1:150. What this means is that for every 75 or 150 people, there is at least 1 engineer.

Last year, our country's population stood at 31.7 million. According to the Board of Engineers, Malaysia (BEM), which registers and regulates all engineers in the country, there are some 110,000 registered engineers. IEM, as a society for engineers from all disciplines, has a membership of more than 40,000.

However, it is estimated that the actual number of engineers in Malaysia is around 200,000 as there are significant numbers of engineers who are not registered with the regulatory bodies. With this number, we have a ratio of close to 1:150, which is healthy for the time being. We should, however, target a ratio of 1:100 by year 2020, in order to expedite the pace of our transformation into a developed nation.

According to the World Economic Forum 2016, about 35% of skills which are considered important in today's workforce, will change within the next 5 years. In the future, 80% of jobs will require some form of STEM background or education.

World Economic Forum 2016 predicts that, by year 2020, some 2 million jobs created worldwide will be related to the fields of Computer, Mathematics and Engineering.

The Ministry of Science, Technology and Innovation (MOSTI) estimates that there will be a shortage of 236,000 scientists and engineers by 2020.

There are several factors underlying the declining interest in Science subjects and the engineering profession. These include the loss of interest in STEM, the misconception

that engineers do not earn much, the misconception that engineers do jobs that are dirty, difficult and dangerous and the lack of Government incentive to promote engineers to top position in the civil services.

It is not true that engineers earn less than their peers in other professions. With their education and training, engineers are generally more analytical and careful as they are well versed with numbers. In reality, engineers earn as much as any other professional. However, they tend to keep a low profile and so have created the impression that the engineering profession is less glamorous, compared to other professions. But in reality, many CEOs of listed companies in Malaysia are engineers.

This declining interest in STEM is worrying for the development of the country. Currently, less than 30% of Form 4 students are in the Science Stream (it used to be 50%). Malaysia is targeting for 60%.

Young people today seem to prefer to take up studies related to business, finance and management instead of STEM-based subjects.

STEM-based degrees such as engineering, have a higher entry requirement. Courses are also generally more demanding and require at least 4 years of study.

It's not true that an engineer's job is dirty, difficult and dangerous. Engineers work in comfortable, safe and clean environments.

A better prospect for engineers to reach top posts in the government sector as well as better status recognition for engineers can be a motivation factor for school students to take up STEM Education and then pursue a career in engineering.

Government recognition of the contribution of engineers and providing a structural pathway to the top position in the Civil Service (e.g. KSN and KSU) will be a big motivator for students to pursue STEM education and engineering.

While it is important to produce more STEM students and engineering graduates to meet the national demand, it also of paramount importance to address the quality of these graduates.

With fewer students taking STEM subjects, there will be a drop in the standard of students who enrol in engineering courses. This, in turn, will result in a potentially lower quality of engineering graduates.

In 2015, IEM published a Position Paper on "Benchmarking the Quality of Engineers", which

highlighted the major concern over the quality and trainability of fresh graduates from local universities due to the lower standard of secondary school students. The findings from that Position Paper, which addressed the need to raise the standard of engineering graduates, was presented to the Ministry of Higher Education.

IEM lauds the Government's efforts to promote greater interest and awareness of Science and Mathematics

programmes in schools. IEM is also actively doing its part by conducting career awareness talks as well as holding competitions and exhibitions on interesting engineering projects in schools.

Engineering students are also encouraged to join IEM as Student Members as this will give them access to IEM's resources such as joining IEM activities, talks and networking sessions. ■