



Education for careers that do not yet exist



Universities have opened their doors for the new academic year, welcoming both the old and the new students. Every year there is an increase in demand for university places as young people look into acquiring a tertiary education as a means of securing and empowering their future. Following the newly announced free education dispensation by the South African government, university placements promise to be much more highly competitive as more students are expected to take advantage of this dispensation to gain the academic skills that will form the foundation for their careers.

The importance of higher education cannot be overemphasized. Countries look to universities for the capacity and skills that drive local economies, lead effective governments, support civil society, and at the same time guide very important decisions, which affect entire societies. University education is expected to enable individuals to expand their knowledge, express their thoughts and ideas clearly, gain higher level skills, increase their understanding of the world and their community, and thus contribute meaningfully to the development of the country's economy. But, most importantly, the resultant graduates should be dynamic and easily adapt to the changing needs of the industry that they will serve. This aspect has become more significant and relevant when considering the modern-day technological developments and industrial changes.

The advent of big-data technologies, the Industrial Internet of Things or the fourth industrial revolution, prompts the question of whether the graduates currently being produced in the engineering fields, including our very own area of mining and metallurgical engineering, are geared for the changes that are inevitable in the industry that they will serve. Technological innovations and disruptors, for example robotics, self-driven cars and virtual assistants, are emerging at such a rapid pace that some of the mining and metallurgical career roles we know today will inevitably become obsolete, while new jobs that currently do not yet exist will be created. The challenge then becomes the preparation for, and the development of skills for, career roles that will exist only in the future.

Although predicting future trends and industries in engineering and technology is a challenging task, an attempt to articulate a vision of future technological trends is essential so that we can produce graduates who can seamlessly transition to the future world. Thus, the approach to teaching and learning as applied in the past needs to change as it cannot be expected to fully satisfy the needs of mines of the future. There is a need to restructure and enhance the education systems in order to bring both the real modern-day and the possible futuristic virtual world into the classroom. Immersing the students in virtual learning environments can help to bridge the gap between the abstract university learning experience and what will be expected or required for the future. The sheer pace of technological advances can make digital competency difficult to teach; however, the idea is not to turn engineers into data scientists, but instead to equip them with sufficient knowledge and skills in the relevant areas to enable them to function meaningfully in their primary roles in the new technology-based environment.

The change in the learning approach should not only apply to university education but should also be considered for the graduate learner programmes in the mining sector. While the mining and metallurgical industry is evolving and changing, graduate learner programmes have remained virtually the same. Graduate learners need to be trained on systems that will enable them to offer a meaningful contribution in the new environments. It is, therefore, heartening to see that the SAIMM Young Professionals Council (YPC) is taking a lead in this. The YPC is working on developing a new graduate learner programme that is in line with the current technological industry revolutions. Such initiatives are meaningful, noteworthy steps towards embracing the developments and changes in the mining sector.

Clearly, both the institutes of learning and the mining industry need to realize that it's not a case of 'business as usual' any more. A whole new level of system thinking is required to ensure that the industry is not blindsided by the future.

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