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Headline: How do you prepare students for an unknowable future?

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The worldwide debate about the impact of disruptive technologies on jobs and the need to prepare future-ready graduates for a future that is not even clear, was a major topic for university leaders from Europe and Asia meeting in Singapore last week.

“So much talk about the impact of artificial intelligence, quantum computing and the internet of everything is turning education upside down,” said Jørgen Ørstrom Møller, adjunct professor at Singapore Management University and Copenhagen Business School, Denmark, in a specially commissioned paper for the Asia-Europe Foundation or ASEF Rectors’ Conference which took place in Singapore on 12-13 October.

“Embarrassingly little” is known about the jobs of the future, says Møller. But even without taking into account future developments, education and research are already “out of tune” with the demand for skills, he notes.

“Technology opens many windows, but human skills determine how they are used,” he said in his paper for the ASEF conference hosted by Singapore Management University or SMU, which brought together more than 200 university leaders, higher education experts, government officials, student leaders and business representatives from Europe and Asia around the theme of “Future-ready Universities and Graduates: Quality education beyond the horizon”.

“It is sometimes overlooked that the higher productivity embedded in new technology only blossoms if humans have the skill to manage technology,” he says.

Pace of change

Universities are concerned not only about disruptive technologies but the pace of change. Engineering professionals are used to technological change, said Nina Waaler, vice-rector for education at Oslo and Akershus University of Applied Sciences, Norway. “It’s the time lag between these [technological] changes that is getting shorter, it is not the phenomenon per se.”

Accelerated change means universities must “instil curiosity and openness [in students] so that they know that what they are learning probably will not be current when they are looking for a job,” Waaler said. Institutions for their part “have to find the mix of factual knowledge and tools to be open and rigorous at the same time. Finding the right balance when the slope is changing, is the great challenge for institutions.”

Last year Foxconn, which manufactures Apple and Samsung smart phones laid off some 60,000 workers in China in a shift to automated manufacturing using industrial robots.

“It is the first example I have seen on that scale,” Don Carlson, Microsoft’s Asia Pacific education lead, told delegates. And it is not just in manufacturing. The use of artificial intelligence in routine aspects of legal services, for example, means that many entry level law jobs are disappearing. “Now you have to bring graduates in [at a] higher [level],” Carlson said.

Vincent Quah, head of business development with education institutions and research organisations for Amazon Web Services, noted a recent report by recruitment site Glassdoor’s economic research arm saying that the time it takes to interview and hire graduates in a large number of countries has increased by 80% in the past few years, in part to select graduates with a wider range of skills. Employers have become more picky.

The higher the level of skill needed, the more intensive the interview process, and the longer it takes to hire graduates. “What that means is that now employers are taking a longer time to screen and to be a lot more careful – what can the graduate bring to the organisation when they first join?” Quah told the conference.

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The challenge is clear for governments and institutions. “How do you cope with the fact that the education you have may not perfectly prepare you for your first, second, third or whatever number of jobs?” said Janil Puthuchery, Singapore’s senior minister of state for education in a keynote speech.

Smart nation

Singapore is among the most forward-looking countries in terms of trying to adapt its education system to better prepare students for a future disrupted by technological developments. Instead of a 20- to 30-year time frame as was normal for their parents’ generation, young people will have to think of a 3- to 5-year time frame before reskilling, noted Puthuchery.

“In a world of so much uncertainty the one thing they [young people] need to take from their education is adaptability – a need to continually learn, be resilient about that process of losing jobs and become comfortable with change and comfortable with uncertainty,” Puthuchery said.

Singapore is at the forefront internationally of “recalibrating” its higher education, as Puthuchery put it. For the Singapore government, this means a focus on strong fundamental skills and lifelong learning.

Singapore’s push to become a smart nation is also filtering down to speedier processing for bringing in new and relevant courses. Last year SMU set up an interdisciplinary programme called ‘Smart-City Management and Technology’, involving computer scientists, social scientists and others.

“The government is leading this whole charge of becoming a smart nation. We wanted our students prepared for it and we had talked to prospective employers who endorsed it [the programme] and the ministry put aside the timeline that they normally required of us and worked with us to make it happen much quicker – easily two-thirds of the time that ordinarily would have been needed to approve a programme,” SMU’s provost Lily Kong told University World News.

University level changes

Libing Wang, head of educational innovation and skills development at UNESCO’s Asia-Pacific regional bureau in Bangkok, told the conference more attention needs to be paid to learning outcomes. He said every higher education institution needs to establish a “chief learning architect” or educationist to develop an overarching framework to be adopted at the subject level and whole university level to make university programmes “more consistent in terms of deep learning content”.

SMU’s school of law has just established an advisory board for law and technology. “The cutting-edge practitioners who are bringing that technology into law firms are on these advisory boards, talking to our law school about what needs to change in the curriculum and how our faculty need to be prepared for that,” said SMU’s Kong.

Some professors resist this, feeling law and technology is a “passing fad”.

“Technologies can come and go but there are some technologies that come and stay and will indeed be the platform for the next phase of technological disruption, so if we don’t conquer this one, we won’t be able to get on to the next one,” argues Kong.

Focus on STEM

At the same time, 85 million middle- to high-skilled jobs required by 2020 may not be filled according to a calculation by management consultants McKinsey. Amazon’s Quah noted a huge rise in demand for experts in cloud computing that cannot be filled.

Microsoft’s Carlson underlined that today 50% of jobs require some kind of technological expertise; “in the future this is estimated to go up to 77%”, he said. This has led to a focus on STEM – science, technology, engineering and mathematics – subjects by policy-makers.

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UNESCO's Wang said the UN institution was thinking of a project to develop the research capacity of universities, particularly in STEM, to improve good higher technical education and engineering education for more sustainable economies.

But other experts said this was not necessarily the right approach. A focus on STEM subjects "may not be wrong per se, but what increasingly matters for reaping the productivity benefit of such knowledge is soft skills – how to use our knowledge and take opportunities offered by technology," said SMU's Møller. "It is in this area that education and research are out of tune. There needs to be a focus on the ability to use knowledge and how to adapt."

"Much attention is devoted to high-calibre education and research and for good reason, but looking at future demand trends, the human factor may actually be more important than normally assumed," he says, adding that health and areas such as entertainment may well prove to be the growth sectors of the future – and the main job providers.