The Digital Education Show: Middle East 2015

Mind the skills gap: arming students with the skills they need to own tomorrow

Keynote Address
Sir John Daniel and Stamenka Uvalić-Trumbić

Stamenka Uvalić-Trumbić

Good morning! It is a pleasure for me to address you, with Sir John Daniel, on the topic: *Mind the skills gap: arming students with the skills they need to own tomorrow.*

What gap do we have to mind?

Are educational institutions out of sync with employer needs?

<u>Youth unemployment</u>

We all know that there are high rates of unemployment of young people aged 15-24 around the world. These are people who are seeking employment but not finding it.

Two years ago The Economist Newspaper called them 'generation jobless' and published a chart that painted a sorry picture. *The Economist* calculated that the world total of inactive young people is nearly 300 million – or one quarter of the world's youth. In 2012, when these statistics were gathered your Middle East and North Africa region fared worst of all, with 40% of the youth population inactive.

Of course a global economic recession began in 2008. If that was the main cause of youth unemployment all will be well when the economy picks up. Sadly, we cannot console ourselves with that hope.

These figures show the change in youth unemployment between 2010 and 2013 in selected countries. It is a mixed picture but does not support the rosy view that this is a passing phase.

Another reason for looking for broader explanations than sluggish economies is that there are lots of vacant jobs. In South Africa, for example, three million young people are not in employment, education or training, including 600,000 unemployed university graduates, yet 800 000 jobs are unfilled. In Africa - and maybe elsewhere - the mismatches between skills and employment get worse countries grow wealthier.

Move further away and look at New Zealand. This chart shows that the under-25s are less likely to be in work than older people. The young are fit and adaptable, so if the education system were doing a good job of giving the next generation the new knowledge and skills necessary for earning livelihoods in the 21st century you would expect the employment situation to be the other way around.

Of course New Zealand is not alone. China has a serious problem of graduate underemployment. In the US the underemployment rate for recent graduates is now higher than in the previous two decades. From 34% in 2001 it rose to 44% in 2012. That means that nearly half of recent American graduates are taking jobs that don't require a college degree – such bartenders or retail clerks. But those reporting this data stress, all the same, that people should not dismiss the value of tertiary education, because many folk without degrees do even worse.

But clearly graduates with degrees could do better too if their education fitted them better for the work available. Should they be studying different things? Should they be working harder at their studies and performing better?

21st century skills

The title of our session assumes that the gap between education and work is skills. Let's start there. We hear a lot about 21st century skills. The Economist Intelligence Unit asked employers around the world what skills they were looking for.

The top five responses were problem solving, team working, critical thinking, creativity and leadership. Basic skills like literacy and numeracy came lower down the list, possibly because the employers surveyed took those skills for granted. They may also have assumed that graduates will have the subject knowledge that they need to make a start in their jobs, even if they require further training for the specific professional tasks they will be required to perform.

In his important book *Teaching in a Digital Age: Guidelines for Designing Teaching and Learning* Tony Bates (Bates, 2015) starts by reflecting on the skills and knowledge that people will need for living and working in today's and tomorrow's worlds. What are his conclusions?

Drawing on work by the Conference Board of Canada (2014) he emphasises the following skills:
- communication skills (including the use of social media)
- the ability to learn independently
- ethics and responsibility
- teamwork and flexibility
- thinking skills
- digital skills
- knowledge management

The last skill on this list, knowledge management, he calls 'perhaps the most over-arching of all the skills'. The skill of how to find, evaluate, analyse and disseminate information within a particular context is a skill that graduates will need to employ throughout their careers.

Bates also makes the important point that because these skills mostly need to be embedded within a knowledge domain, developing them is often context specific. For example, some of the teamwork skills required in the accident and emergency room at a hospital are different from those required by diplomats seeking consensus on a solution to an international crisis. That is the challenge. General training courses in communication and knowledge management skills are just a start. Content and skills are tightly related so we must pay attention to both skills development and content acquisition.

Bates argues that this imposes constraints since 'although content knowledge can be transmitted equally effectively through a wide range of media, skills development is much more tied to specific teaching approaches and technologies'.

What about academic knowledge?

But there is more to come. For university students we need to distinguish between knowledge based on direct personal experience and academic knowledge. What do we mean?

The difference, which Laurillard (2001) explores carefully in her framework for the effective use of learning technologies, is that academic knowledge is 'a second-order form of knowledge that seeks abstractions and generalisations based on reasoning and evidence'.

Today's eagerness to stress the importance of skills has a tendency to denigrate the significance of anything with the word 'academic' attached. But a moment's reflection shows that this is ridiculous. It is not an accident that the societies that have prospered in both the industrial era and the knowledge age attach importance to rigour, abstraction, evidence-based generalisation, rationalism and academic independence. Depreciating the importance of academic knowledge is tantamount to cutting off the branch on which we are sitting.

Our students need to understand the four fundamental components of academic knowledge: transparency, codification, reproduction and communicability, which apply equally to be pure and applied knowledge.

Sir John Daniel

Thank you Stamenka. Let me elaborate on this point, We do not deny the importance of the experiential component of study, but we do argue that that academic knowledge is likely to be more future proof than much experiential learning over a graduate's career.

That's a challenge because it means that university teaching must persuade students to change the way they experience the world. They must review, analyse and explain their direct experiences in order to match them to the conventions and assumptions of the subject domain. The second-order character of academic knowledge means that it relies on symbol systems, such as language or mathematics, to describe the world. These

require interpretation. In other words, a role of university teaching is to mediate between students' experience and its symbolic representation.

An example will make this clearer. The classic example is Newton's Laws of Motion, especially the Third Law, which states that for every action there is an equal and opposite reaction. Twenty-five years ago Howard Gardner showed that even MIT physics students adopted the practices of naive elementary students when studying Newton's Laws of Motion. He also showed how college biology students typically misunderstand evolutionary theory. The website of the American Psychological Association (2015) includes an account of other 'Common Alternative Conceptions (Misconceptions)' in Science, Mathematics and Language Arts.

Implications for teaching and learning: how can technology help?

Where does this leave us? Students need equipping for the 21st century with three assets: subject content that can be related to work, academic knowledge of that content, and skills embedded in that knowledge domain.

That poses a challenge because Diana Laurillard (2001) argues that we cannot expect students to construct academic knowledge simply through independent study or discussion with their peers. The teacher's role is not merely the transmission of the skills and facts and concepts of discipline, but also the conventions and rules for acquiring and validating knowledge in that subject.

That is the challenge. Tomorrow's graduates will need a combination of 21st century skills embedded in academic and content knowledge of particular topics. How can technology help?

Blended or hybrid learning?

Most higher education institutions now say that they are moving towards blended learning. This can mean any mix of face-to-face teaching and online learning. Bates (2015, p. 309) lists some of the variety of designs that this can include, from the use of PowerPoint or clickers in class to hybrid learning, which requires the redesign of teaching to enable students to do the majority of their learning online, coming to campus for specific sessions that can only be done in person.

We believe that hybrid learning is the future. The challenge is to redesign the whole learning system to create optimum synergy between the in-person sessions and learning online.

How do we allocate learning activities between in-person and online? We believe that everything that can be done online should be done online. Hundreds of research papers have shown that face-to-face teaching is <u>not</u> more effective than online teaching. In most cases online learning gives better results. Furthermore online learning is usually less expensive, more flexible and more convenient for the students.

<u>What teaching and learning must be done in person?</u>

So instead of asking what should be done online, we ask what should <u>not</u> be done online? In other words what, if any, are the special attributes of face-to-face teaching?

We have just identified one of them. Some students will need conversational interaction with teachers if they are to understand fully some of the academic knowledge in their discipline like Newton's Laws of motion.

A second requirement is for teachers to assess and comment on students' independent work. One element of the crisis of higher education in the US is that students are simply not working enough.

We refer to research by Arum & Roksa (2011), *Academically Adrift: Limited Learning on College Campuses.* It found that 36 percent of students did not demonstrate any significant improvement in learning over four years of college. The main reason is a lack of rigour in their studies. 32 percent of students each semester do not take any courses with more than 40 pages of reading assigned a week, and half don't take a single course in which they must write more than 20 pages over the course of a semester...

Students spend, on average, only about 12-14 hours a week studying, and much of this time is studying in groups. Yet the research showed that students who study by themselves for more hours each week gain more knowledge while those who spend more time studying in peer groups see diminishing gains.

If students are to learn more they must do more independent work. And for that work to be really effective teachers must review it in a constructive spirit to help students build knowledge and understanding.

This sounds like a tall order. Students need their teachers to interact with them individually about academic knowledge and comment thoroughly on their assignments. In most institutions this is not happening. Teachers are spending their time lecturing to large groups.

One other area where there are limits to role of online learning is laboratories and practical work. But technology can take over many of those tasks too. Bates (2015, p. 324) suggests how to design a hypothetical course in haematology and concludes that four of the six key components of content and skills could be done perfectly effectively online.

<u>Conclusion</u>

The outline for this session calls for us to explore 'how technology can be used as a catalyst for change in the system' and as a 'tool to help develop core skills that will enable students to thrive in the future world of work'.

We believe those ambitions are far too modest and we prefer the final statement in the session description, which calls for 'harnessing the transformational power of technology in making learning relevant, engaging and steeped in the real world'. Technology has enabled humankind both to improve quality and to cut cost in most of the products and services on which we rely. This can also be true of postsecondary education.

We look forward to a future of hybrid learning where all teaching and learning that can be done by or through technology is done by or through technology.

The teachers' role will focus on working with individual students to help them embed the knowledge and skills they acquire online and to build up their competency and understanding by constructively critical appraisals of their independent work.

References

American Psychological Association (2015). Some Common Alternative Conceptions (Misconceptions). http://www.apa.org/education/k12/alternative-conceptions.aspx accessed 2015-08-08

Arum, R. & Roksa, J. (2011) Academically Adrift: Limited Learning on College Campuses By Chicago: University of Chicago Press.

Bates, A. W. (2015). *Teaching in a Digital Age: Guidelines for Designing Teaching and Learning,* BCcampus. http://opentextbc.ca/teachinginadigitalage/ accessed 2015-07-16

Conference Board of Canada (2014) *Employability Skills 2000+* http://www.conferenceboard.ca/topics/education/learning-tools/employability-skills.aspx accessed 2015-08-04

Economist Intelligence Unit (2015). *Driving the Skills Agenda: Preparing Students for the Future*. http://www.economistinsights.com/analysis/driving-skills-agenda accessed 2015-08-03

Laurillard, D. (2001). *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies*. NewYork/London: Routledge.

The Economist (2013). The number of young people out of work globally is nearly as big as the population of the United States, April 27. http://www.economist.com/news/leaders/21576663-number-young-people-out-work-globally-nearly-big-population-united accessed 2015-08-13

The World Bank (2015) Unemployment, youth total (% of total labor force ages 15-24) modelled ILO estimate). http://data.worldbank.org/indicator/SL.UEM.1524.ZS accessed 2015-08-13