

DISMANTLING ED-TECH SOLUTIONISM

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about *inspired*

inspired is a not-for-profit OUM e-magazine on the 3Ps - practice, policy and philosophy - of teaching and learning in and beyond OUM. Published thrice-yearly, it engages a readership of OUM learners, staff, tutors and the interested public. *inspired* evolved out of *TCX (Tutor Connexions)*, a now-discontinued OUM e-newsletter which saw 45 issues published over almost a decade.

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editor's note

OUM recently hosted the virtual 2021 International Conference on Education (ICE), during which many thought-provoking ideas were exchanged and collegial relationships were built between scholars spread out across the globe. This issue of *inspired* is an early fruit of the ideas and the ties that were the outcome of the conference. We hope you will find something in it that resonates with you.

Best

Dr David Lim, Editor

important dates

NEW LEARNERS

E-TUTORIALS 1 & 2

Undergraduate
27 Sept - 10 Oct 2021

Postgraduate
27 Sept - 10 Oct 2021

E-TUTORIALS 3 & 4

Undergraduate
11 Oct - 24 Oct 2021

Postgraduate
11 Oct - 24 Oct 2021

E-TUTORIALS 5 & 6

Undergraduate
25 Oct - 7 Nov 2021

Postgraduate
25 Oct - 7 Nov 2021

E-TUTORIALS 7 & 8

Undergraduate
8 Nov - 21 Nov 2021

Postgraduate
8 Nov - 21 Nov 2021

E-TUTORIALS 9 & 10

Undergraduate
-

Postgraduate
22 Nov - 5 Dec 2021

SENIOR LEARNERS

E-TUTORIALS 1 & 2

Undergraduate
20 Sept - 3 Oct 2021

Postgraduate
20 Sept - 3 Oct 2021

E-TUTORIALS 3 & 4

Undergraduate
4 Oct - 17 Oct 2021

Postgraduate
4 Oct - 17 Oct 2021

E-TUTORIALS 5 & 6

Undergraduate
18 Oct - 31 Oct 2021

Postgraduate
18 Oct - 31 Oct 2021

E-TUTORIALS 7 & 8

Undergraduate
1 Nov - 14 Nov 2021

Postgraduate
1 Nov - 14 Nov 2021

E-TUTORIALS 9 & 10

Undergraduate
-

Postgraduate
15 Nov - 28 Nov 2021

AN ALTERNATIVE MODEL TO MOTOR SKILL DEVELOPMENT

By Dr Vaikunthan Rajaratnam

One of the key learning outcomes in most educational or training programmes, especially vocational-based ones, is the acquisition of psychomotor skills. It requires that learners be trained to perform motor actions for tasks to be executed in the real world, such as the workplace or the community. Traditionally, the learning of motor tasks is based on the in-person apprenticeship model in which the learner spends long periods of time watching and learning from the teacher as master craftsman. This time-tested model is however facing increasing constraints in institutional resources, including the limited availability of master craftsmen, resulting in reduced opportunities and time for learners to develop the required skills. In the face of these constraints, educators, trainers, and professionals have come up with alternative models that leverage on online training modules to help learners achieve a level of psychomotor mastery beyond mere competency.

Sound online alternatives to in-person apprenticeship are built on tried and tested foundations in instructional design and technology. They often draw on evidence gained in the field of cognitive neuroscience of learning to help teachers become effective in facilitating learner acquisition of the requisite skills. Their essential consensus is that skill-acquisition occurs in three

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broad stages. At the cognitive stage, the learner understands and intellectualises the task by receiving explanation and by observing an expert performing the task step-by-step. With repeated practice and feedback, the learner subsequently reaches the associative stage, at which knowledge is translated into the appropriate motor behaviour. The learner learns to execute the task smoothly and with fewer interruptions although she is still thinking actively about the various motor movements required for the task. Lastly, when the learner reaches the autonomous stage, she will be able to perform the task smoothly with minimal mental effort and almost automatically to the level of an expert.



Research has shown that learning, while fundamentally cognitive, is also often a social practice enhanced by expert modelling



Research has shown that learning, while fundamentally cognitive, is also often a social practice enhanced by expert modelling, that is, by observations and interactions with instructors and peers. The learner benefits from observing model behaviour and by noting the consequences of that behaviour. Vicarious reinforcement of this type is underpinned by four requisites. The first is attention, which requires the learner to attend to the modelled behaviour. The second is retention, which requires the learner to remember features of the modelled behaviour. The third is reproduction, which requires the learner to organise her responses by following the modelled behaviour. Fourth, and lastly, is motivation, which necessitates the learner to be interested in performing the modelled behaviour in order to skilfully reproduce it.

Research has also shown that expert performance requires deliberate practice (defined as repeated practice in motivated individuals receiving regular reinforcement and feedback), and that continuous deliberate practice is necessary to maintain mastery. It has been shown that the maximum

level of performance is determined not only by the amount of time spent in performing the motor task but also by the number of hours spent in deliberate practice, for instance, by completing a highly structured set of activities with the explicit goal of improving performance. The theoretical understanding here is that performing a motor action and thinking of doing that action will activate similar systems in the brain as the seat of learning. This explains the basis for motor imagery, which is the mental execution of a motor task by incorporating the kinaesthetic cues without overtly performing the task. Motor imagery and mental practice are “functional equivalents” and have been used for motor skills training in sports, music, and medicine. Thinking of doing something physical (motor task) with all its kinaesthetic and imagery cues (the feeling of doing it) is just as good as doing it physically!

In other words, the basis for the acquisition of motor skills to a level of expertise requires the learner to first understand the various tasks and subtasks that need to be performed. To facilitate this, video recordings of the master performing the task may be made available to the learner. The learner must then experience the task by doing it herself and, in doing so, acquire the visual and kinaesthetic feeling of performing the task. Then, the learner must be instructed in the mental skills of imagining the task and practising the motor task in the mind with the teacher’s guidance. Lastly, the learner will augment her learning with deliberate physical practice of the task until she achieves a stage of mastery with smooth motor performance with minimal mental effort. These steps constitute a model that may be used as a guide to develop instructional materials for learning the requisite motor skills. The advantage of this model is that it is low-cost and universally accessible to learners from varied backgrounds. It dispenses with the need for high technology and expensive simulators which may not be easily available.

Within this scheme of things serving as an alternative to the traditional in-person apprenticeship model, the teacher’s role is to identify the tasks and subtasks that are needed for given motor skills, and to then develop instructional videos of a master performing the tasks so that the learner may subsequently use

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them as part of her asynchronous learning. The teacher can develop a detailed explanation of how to perform the task by drawing on the master’s input on how he does it, with rich details of the feelings he experiences bodily as he performs the tasks. The master’s explanation or “mental script” will be the audio of the instructional videos that may be made accessible online to the learner on the institution’s learning management system (see Figure 1). All this will aid the learner to conduct repeated mental practice on demand in a self-paced and self-regulated manner.

The simple and accessible model described above will enable the learner to practise given motor tasks, even remotely, depending on the type of practice model used. At any rate, the learner must be clearly informed about the assessment methods and even be provided detailed descriptors of the mastery stage of the index task allowing for self-assessment. Summative assessment can be performed remotely and asynchronously by the teacher via digital video recording of the performance of the motor task by the learner.

“ Motor imagery and mental practice are ‘functional equivalents’ and have been used for motor skills training in sports, music, and medicine. ”

In sum, if as a teacher your aim is to coach your learners to become experts and masters of motor tasks, then, the suggested model may well fit your needs. Feel free to use it to create your own tools. Good luck!

Dr Vaikunthan Rajaratnam (vaikunthan@oum.edu.my) is a surgeon, medical educator, and instructional designer with four decades of clinical practice. He is currently a doctoral student at OUM. inspired



Figure 1: A model for motor skills development using mental practice



Image courtesy of Dr Hanna Teräs

DISMANTLING ED-TECH SOLUTIONISM:

A Conversation with Dr Hanna Teräs, Tampere University of Applied Sciences, Finland

by Dr David Lim

Dr David Lim (DL): At the recently held 2021 International Conference on Education [ICE] hosted virtually by Open University Malaysia [OUM], you delivered a keynote address titled “Effective Online Learning: Back to Basics.” Please tell us a little about yourself, the keynote in general, and the reason why you thought the topic warranted wider reflection?

Dr Hanna Teräs (HT): My work for the past 20 plus years has been on digital learning environments and online teaching and learning in higher education in Finland and Australia. I’ve designed and taught fully online courses since 2000, and I’ve also done plenty of research in the digitalization of higher education. Therefore I’ve had the opportunity to see the field develop and mature, but I’ve also seen trends come and go. Over the years we’ve often also talked about the same old things with new and fashionable names! Trends change, but the basic principles of good pedagogy don’t. That’s why I wanted to draw attention back to basics and invite people to think of technologies through a solid pedagogical lens.

DL: A key point you made in your keynote is that there is a popular belief held by many, including teachers at the university level, that technology should drive, if not revolutionize, learning. The case is almost similar to the expectation that the tail [technology] should wag the dog [precipitate learning], when good – but not necessarily common – sense dictates that the dog should be wagging the tail, that is, for learning to take place with the selective aid of technology. Why do you think that is the case? How prevalent is the belief, and how does one counter it – and the policy actions driven by that belief – to ensure that good sense prevails?

HT: Humankind is very eager to put a lot of hope in technology! We see this everywhere, from science fiction to Wall Street. Just look at our most popular narratives, our superheroes and action movies. Iron Man saves the universe with almost otherworldly technologies. Aliens from space are always portrayed with superior, advanced

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technological know-how. In our everyday world, we invent machines to make life easier for us. Economy-wise, it's technology projects that get funded – even during the pandemic, the winners are technology companies. This is a very powerful grand narrative that is sometimes hard to challenge. But we should remember that learning is a very human thing. It takes place in social contexts, technology can't replace that. Sure, it can be helpful, but just as you say, we shouldn't mix up dogs and tails here.

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DL: Why do you think there is such a huge gap between the promise of technology and the actual benefits that technology brings to learning?

HT: I believe it's for these very reasons. We put disproportionate hope in technology. We expect things of it that it cannot possibly deliver. If we put half as much effort in people – in creating supportive, appropriately resourced environments where teachers and students can feel that they are valued and supported – I honestly believe that would have a fantastic impact on the quality of teaching and learning.

DL: In an earlier paper you co-authored titled “Post-Covid-19 Education and Education Technology ‘Solutionism’: a Seller's Market,” it was argued that the “technologization” of education and the “educationalization” of teaching and learning are indeed problems that are not often sufficiently recognized as problems. Could you expand on that, and explain how neoliberal capitalism is implicated in all this?

HT: It all boils down to the perception we have of education. Do we see education as something that has value in its own right, as a path for human growth and emancipation on personal and citizenship levels, or as instrumental, harnessed to

drive economic growth? The claim we make in the paper is that the latter view is taking over and that technologization and educationalization are by no means “neutral” phenomena but that they boost this agenda. “Better learning”, “student retention”, or “improved learning outcomes” sound like an undeniably good goal, but when we dig a bit deeper, we often see that the agenda behind these goals is revenue-based and driven by the need to boost economic growth.

DL: In the same co-authored paper, concern was raised about businesses, such as education-technology companies, taking advantage of the pandemic by strengthening and accelerating “platform capitalism” – that is, by harnessing “online platforms as profit-generating engines functioning on the basis of collecting and using ever-increasing masses of data.” Could you unpack what you meant by this? How serious is the problem – even for those without the financial wherewithal to purchase the ed-tech touted and marketed as solutions? How vigilant should higher education providers be in the face of this form of capitalism dressed as panacea?

HT: It's very interesting and also somewhat alarming to actually examine how education technology companies have increased their influence on education, even on policy level. Organizations such as OECD have a strong impact on how educational policy is made, even on national governments' level. However, when you take a closer look at some of these international reports and discussion papers from various organizations, you find that the sources they cite are often somewhat biased toward the mentioned grand narrative of digitalization. Sometimes they don't even cite relevant research much at all. Instead, there can be numerous references to, for example, Microsoft reports or Silicon Valley technology companies' blogs and other such writings. These companies of course have a financial interest in driving educational technologies in educational policy making. Having said that, I want to make clear that I'm not against educational technologies. On the contrary, I think many technological tools can be very useful. But I do advocate a bit more critical thinking and pedagogical design in making important choices

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regarding technology solutions.

DL: In your keynote, you called for higher education providers to return to the basics. Your advocacy is, as I understand it, premised on a Finnish needs analysis conducted to discover the factors that promoted and hindered learning from the perspective of university students. What are these basics, and how have institutions that have responded to the call fared, if follow-up research on this has been conducted? Also, what lessons might we draw and apply to universities that offer an online component of teaching and learning?

HT: Yes, we did conduct a needs analysis with university students in connection with a wide-scale national project in learning analytics quite recently. Learning analytics is a great example of a technology that is loaded with heaps of expectations, and sometimes you hear people talk about it almost as if it could solve all educational problems in an instant. But what we found in the project was that there are no such easy answers. We wanted to challenge people to think what the problem actually is. If learning analytics is the solution, what then is the problem? This is why we involved students in focus groups and workshops where they shared their most pressing issues and problems regarding studying and learning. We found that their needs would be met with solid pedagogical thinking, usability, and learning design. You know, things like feedback, constructive alignment, user-friendly learning platforms, good communication, and the like. These are the main takeaways for us. Learning analytics won't help the students in their learning if the course design and pedagogical approach are not prioritized.

DL: Collaborative learning packaged as “knowledge co-construction among peers in a community of practice” is a buzzy concept that universities are increasingly championing. What is your view on this? Also, how might it affect introverted learners in comparison to extroverted ones?

HT: This is a concept that is so much easier said than done. I do believe in collaborative knowledge construction and communities of practice, but

these don't just emerge by telling the students to do so. First, communities of practice form out of genuine need and common interest; I don't believe we can tell anyone to form a community of practice. Students need to have a genuine interest and need to do so. This is usually better achieved in more authentic learning contexts, where students work on a real, open-ended problem or project together. Even then, collaborative learning must be facilitated. All too often we just give students a group task and say that they should collaborate. They seldom will! At best, they cooperate and divide labor amongst themselves – you know, you do this part, I'll do this part, and John here will do the third part. That's not collaboration. True collaboration should lead to something that is larger than the sum of its parts, which means that the task should be one that no one student can complete alone. Having said that, I'm also wary of over-using collaborative learning. It can become very burdensome for students. Your point about introverted and extroverted students is also valid. I believe there should be pedagogical variation, so that different students and different personalities will have an equal chance to excel.

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DL: It is not often that readers see critical theorists such as Slavoj Žižek and Pierre Bourdieu being cited in papers on education which tend to be staid and conservative rather than open to interdisciplinarity. Can you tell us more about your interest in critical theory, how it has informed your conception of education, and how it might invigorate thought in educational studies?

HT: Yes, you're right! Isn't it funny, there is so

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much talk about the so-called twenty-first century skills, general graduate attributes, or employability skills, and all of these lists incorporate critical thinking skills. Yet we shy away from critical theory! To me, critical theory is a way of revealing “cracks” in the prominent narratives that prevail in educational discourse, digitalization being a good example. Without critical theory, power structures easily go unrecognized and unchallenged. Our critical thinking so easily stays within the established frameworks of thought: for instance, when I ask students to evaluate digital teaching and learning tools critically, they often tend to stay on surface level and concentrate on user-friendliness, accessibility of the technologies, and the like. This is of course important, but critical theory helps in taking a deeper look: why are we using this technology, whose agendas are being driven, how does this connect to the big picture?

DL: Lastly, please could you share your personal vision for higher education, especially the type delivered in hybrid and online modes? To what extent have critical thinkers including Paulo Friere, Ivan Illich, and others shaped your own philosophy of education?

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My dream for higher education is one where academics and students are not seen as objects to whom digitalization happens, but are actually involved in imagining and shaping humanized digital futures.

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HT: These critical thinkers have indeed had a great deal of influence on my philosophy of education! My dream for higher education is one where academics and students are not seen as objects to whom digitalization happens, but are actually involved in imagining and shaping humanized digital futures. We haven't really asked them what kind of a digital future they

want, have we? It's almost as if digitalization is a force of nature to which everyone needs to adapt. In his 1968 book, *The Revolution of Hope: Toward a Humanized Technology*, Erich Fromm makes a case that in our quest to develop effective scientific procedures and computers, we have actually come to a point where these no longer act as tools but have begun to shape and dominate thinking. This idea is now more valid than ever. I sincerely hope that we find ways of working towards humanized digital futures. In fact, our new research project explores and develops innovative methodologies to reimagine digital education and a more humanized and emancipatory educational data science development. You can read about it here:

<https://www.tuni.fi/en/research/speculative-social-science-fiction-digitalization-higher-education-towards-humanized>

DL: Many thanks for sharing your thought-provoking ideas with us, Hanna!

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