Thriving in Higher Education

How does good design help?

Peter Goodyear
The University of Sydney

Teaching and Learning at Deakin   **DEAKIN UNIVERSITY**

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2017 LEARNING & TEACHING
CONFERENCE
LEARNING BY DESIGN

Keynote at the Deakin University Learning and Teaching Conference

These notes have been added to the slides *after* giving the talk. They don't always reproduce what I said. They are a kind of 'rational reconstruction' of the essence of what I was trying to say, now that I've heard myself try to say it.

The abstract for the talk:

Todays' higher education system is under a great deal of structural pressure. There have been rapid, under-funded changes in the scale, scope and nature of what we do. There are competing views of what universities are for. Unresolved tensions over deeper purposes and priorities create strains that permeate university life – affecting faculties, schools, staff and students. There are no simple remedies. In this talk, I want to share some thoughts about design and make an argument for strengthening design activity in teaching and learning. I will focus on aspects of design thinking and practice that are particularly helpful in identifying opportunities for beneficial change and resolving competing forces. Design thinking is sometimes offered as a way of patching broken systems. I will suggest instead that some forms of design thinking take us to the very heart of the academic enterprise. In addition to exploring the notion of 'teaching as design' – as a way of making space for collaborative engagement in worthwhile innovation - I will share some of our recent work on learning as the design of novel inquiries into 'wicked' problems. The university has a unique role to play in society. It is not easy to engage students authentically in its essential work. Good design, I suggest, is part of the solution.
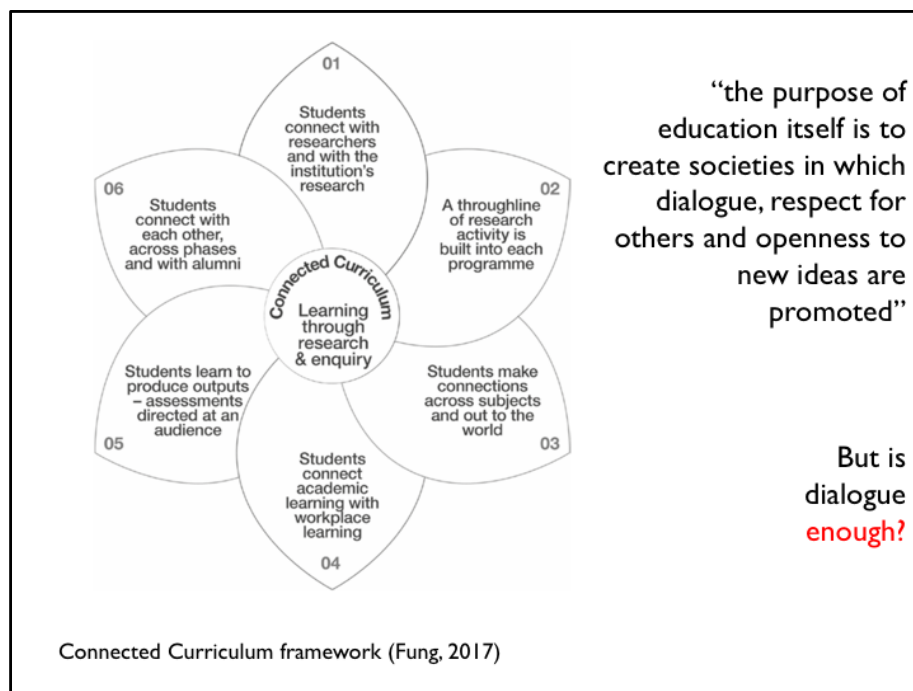
Connected Curriculum framework (Fung, 2017)

Image Source: Fung, D. (2017). *A connected curriculum for higher education*. UCL Press, London. Retrieved from: http://www.ucl.ac.uk/ucl-press/browse-books/a-connected-curriculum-for-higher-education

A key theme in my talk is connectedness & integration – trying to find smart sustainable strategies for resisting the fragmentation of academic life and university missions.

One realisation of this – or at least a vehicle for exploring – in the connectedness of research and teaching that can be found in *inquiry*.

An excellent resource for thinking about this and other related issues of connectedness and university purpose is Dilly Fung's open access book.

My additional point here is that dialogue is indeed vital, but so too is helping our students 'tool up' for other kinds of action and change in the world.

What is university for?

Imperfect instances of a crucial (unique) social institution

Formative aspirations:
- disinterested search for what is worth knowing
- commitment to using knowledge for social benefit/change

University education as induction into the best working practices of the academy – including both disinterested inquiry and the growth of moral know-how

From the individualised autonomous learner to the collaborative/collegial epistemic engineer

Creating spaces that help people learn to create spaces for shared inquiry and action (Sterelny; Markauskaite & Goodyear)

It's easy (some might say chic) to espouse cynical interpretations of the state of contemporary higher education and the forces shaping it.

Let's be optimistic. The neo-liberal experiment is coming to an end. Market forces aren't the only drivers for HE. Universities need to rediscover and celebrate the things that only they can do (or at least, those things which they do best).

How we approach the education of our students ought then to (at least partially) reflect the distinctive social purposes of universities.

In the talk, I will take us through some design ideas that refer to designing inquiry-based learning, moving on to designing so that students learn to design their own inquiries and learn to design their own epistemic environments. In other words, among the higher order goals for HE should be helping students learn to create spaces (for themselves and others) that are supportive of complex inquiry and design for change.

Some of the ideas about design, inquiry, co-creating - and consciously and conscientiously inhabiting – epistemic environments are discussed in the last two chapters of the Markauskaite & Goodyear (2017) Epistemic fluency book. See ref on next slide.

For a bigger view, see also Kim Sterelny on engineering epistemic spaces from an evolutionary perspective. Sterelny, K. (2003). *Thought in a hostile world: the evolution of human cognition*. Oxford: Blackwell. Sterelny, K. (2012). *The evolved apprentice: how evolution made humans unique*. Cambridge

3

MA: MIT Press.

To thrive …flourish, prosper, grow vigorously, develop well, burgeon, bloom, blossom, do well, advance, make strides, succeed

Student learning at the centre …
What's good for them is good for us

Designing inquiry: "… not to be dismayed by complexity but to be capable and daring in unravelling it" (Boulton & Lucas, 2008, p9)

Designing for change: the growth of moral know-how

Actionable knowledge for knowledgeable action

Induction into (the best of) what universities contribute

My talk puts student learning front and centre, but I also want to argue that getting better at designing for (and with) them will help us (the education workforce) become better at designing better ways of working for ourselves, and better spaces to work in (material and digital, etc)

I'm coupling inquiry and change: the growth of skills (etc) needed to unravel complex phenomena, come to a decision about what should be done, and then act in ways that are likely to lead to beneficial change.

We leave students under-equipped with knowledge/skills needed to make change in the world; we (deliberately or unconsciously) conceal much of 'how things get done'; we don't cultivate what might be called 'moral know-how' – practical knowledge guided by a moral sense.

We also (I think) underplay 'actionable knowledge' – a key topic in the book Lina Markauskaite & I recently published.

Boulton, G., & Lucas, C. (2008). *What are universities for?* Leuven: LERU.

Markauskaite, L., & Goodyear, P. (2017). *Epistemic fluency and professional education: innovation, knowledgeable action and actionable knowledge*. Dordrecht: Springer.
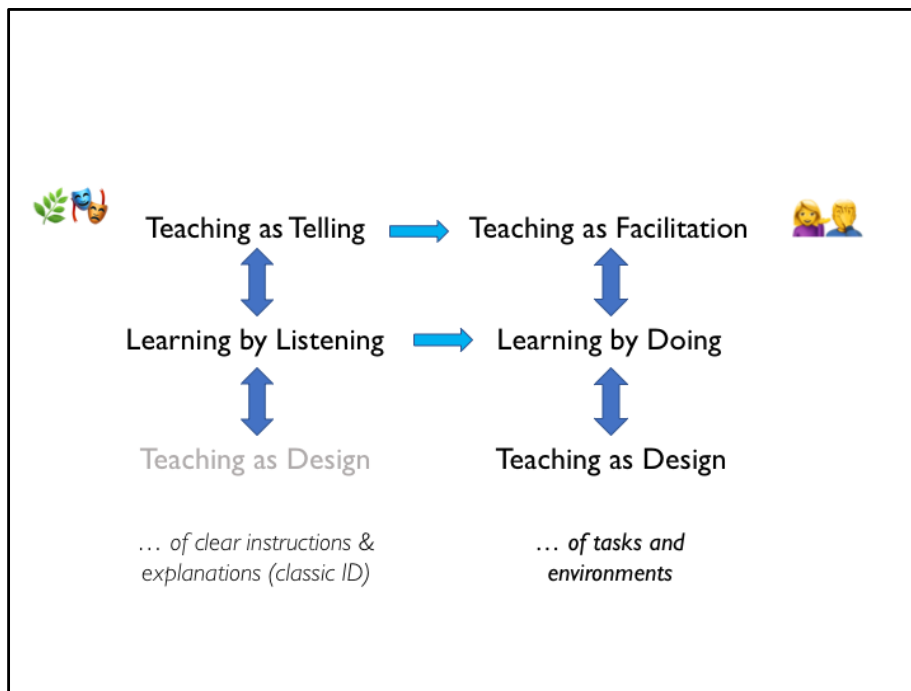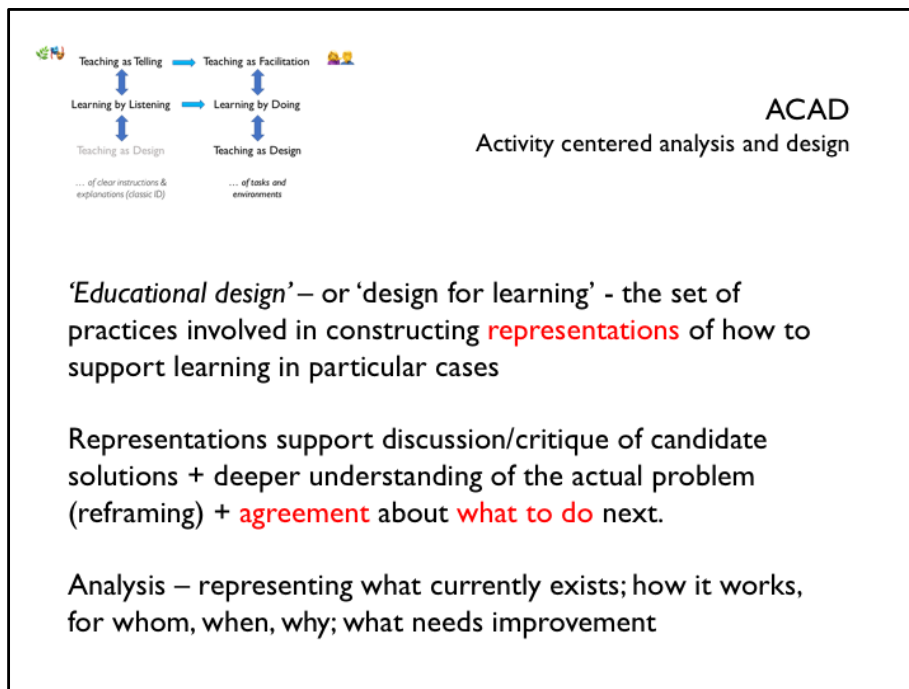
A simple/simplifying tale we tell ourselves about conceptions of learning and teaching in HE is that the focus is shifting from teaching as telling (and learning by listening) to learning by doing (and teaching as facilitation).

My work over the last 10 years or more has been exploring a (sometimes missing) complement to 'teaching as facilitation' – 'teaching as design'

In short, worthwhile learning activity is likely to become more worthwhile if some extra thought is put in at 'design time'.

I'll come back to this later in the talk, where the idea of 'three orders of learning' is introduced, but I should also point out here that my earlier treatments of 'teaching as design' ignored the design work that often goes into 'teaching as telling'.

'Educational design' – or 'design for learning' - the set of practices involved in constructing representations of how to support learning in particular cases

Representations support discussion/critique of candidate solutions + deeper understanding of the actual problem (reframing) + agreement about what to do next.

Analysis – representing what currently exists; how it works, for whom, when, why; what needs improvement
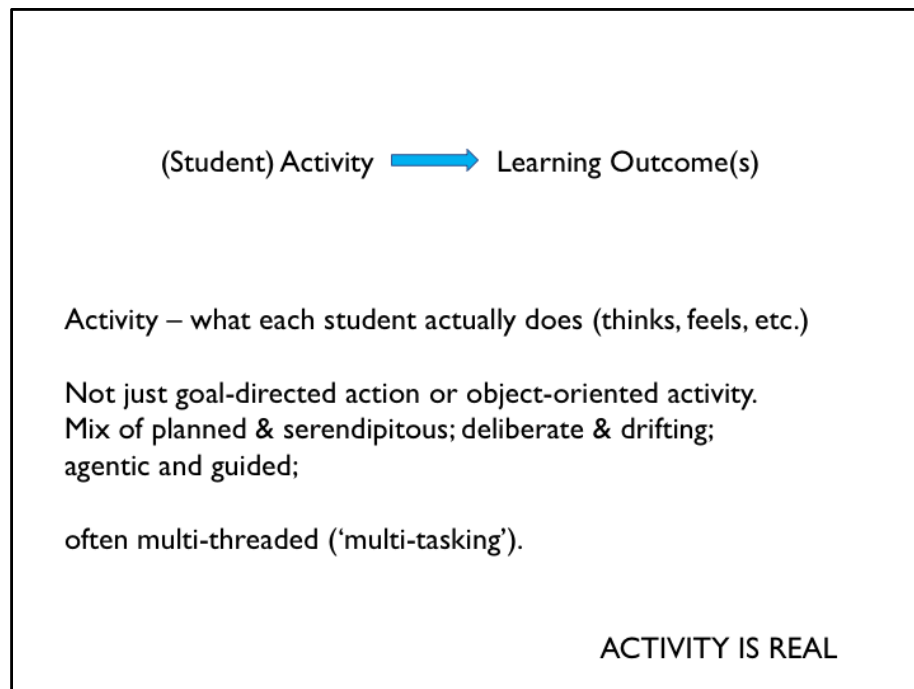
A few words about what I mean by design

The educational design definition comes from Goodyear (2005) – which is open access.

The focus on creating representations is important – I see these as key resources for discussion and joint sense-making within design & development teams. Representations of (a) what is intended and (sometimes) (b) what currently exists, and how it works, can help ground conversations and decision-taking in such teams. Without them, it's too easy for the work to be done too quickly: progress oiled by false consensus and creative use of ambiguity. Terms like 'student centered', 'authentic', 'open and flexible', 'scaffolded' and 'engagement' can paper over cracks in understanding of what is meant to happen (or already happens). Of course, representations are just models – judged by utility rather than veridicality.

Representations can take many forms, but one of the group design processes they should sometimes support is deeper scrutiny of the 'problem' being worked upon. Using candidate solutions to get better insights into the *real* nature of what's needed is a classic process in good design. It often leads to serious 'reframing' of the problem.

Goodyear, P. (2005). Educational design and networked learning: patterns, pattern languages and design practice. *Australasian Journal of Educational Technology, 21*(1), 82-101.

> (Student) Activity ➡ Learning Outcome(s)
>
> Activity – what each student actually does (thinks, feels, etc.)
>
> Not just goal-directed action or object-oriented activity.
> Mix of planned & serendipitous; deliberate & drifting;
> agentic and guided;
>
> often multi-threaded ('multi-tasking').
>
> ACTIVITY IS REAL

My preference when talking about educational design is to:
a) Try to maintain a coupling between processes of analysis (of what already exists) and design (of what is wanted)
b) Focus sharply on what the students are actually doing – which I call their **activity**.

Activity is real. It is usually a mix of the planful & goal oriented (on the one hand) and the serendipitous (on the other). My use of 'activity' is therefore different from its use in activity theory, which only sees object-oriented (purposeful) activity as activity. I want to include more serendipitous, exploratory, wandering modes of activity under the 'activity' heading because these too lead to learning.

Activity can then be seen as causally related to learning outcomes. The effects of teaching, design, technology etc are mediated by the students' activity. They have no direct effects on outcomes.

This may seem obvious, but a huge amount of time and effort is wasted by people looking for direct connections between tools or teaching methods (on the one hand) and outcomes on the other.

The last key point to make is that though student activity is the only thing that really matters, it is NOT designable. One cannot design someone else's learning, though one can try to design *for* it. Design is indirect.

(Student) Activity ➡ Learning Outcome(s)

Most of the activities in which students are engaging, and through which they learn, are either:

- unsupervised, or
- only lightly supervised

Limits on what teaching as facilitation can be relied on to achieve

Puts a premium on good design for learning
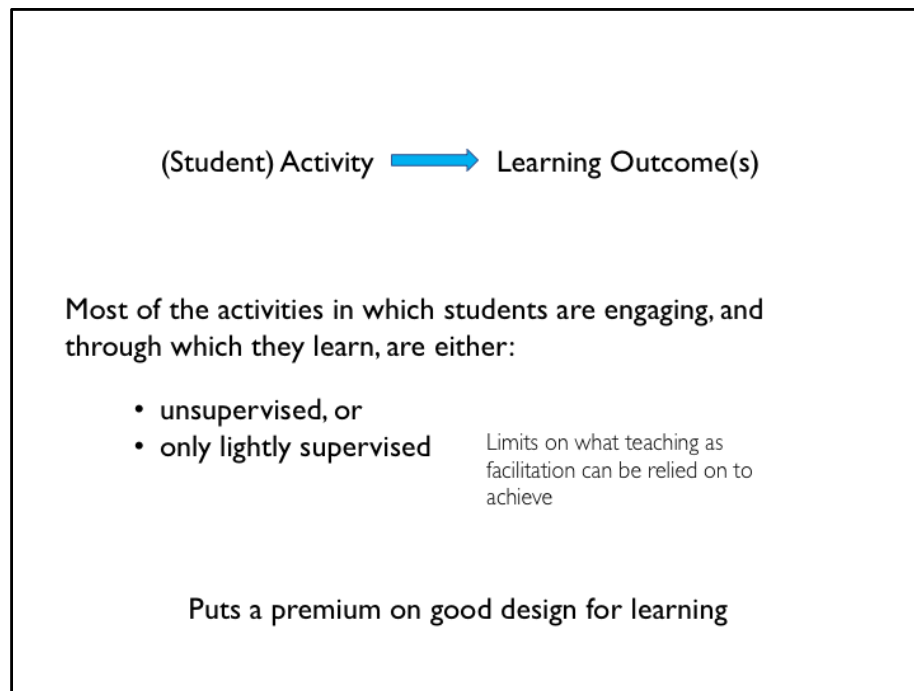
Thinking more carefully about that 'sage on the stage to guide on the side' paradigm shift, we have to be careful not to overestimate the powers of facilitation.

Students do a lot of work without any direct supervision from teaching staff. Even in so-called 'face to face' situations, it's rare for the staff:student ratios to be generous enough to allow for more than a few minutes for each student. Also, it's often very hard for people doing monitoring and supervision work of this kind to get clear insights into what students are thinking – how they understand what they need to be doing, etc.

This puts even more of a premium on good design – especially good task design.
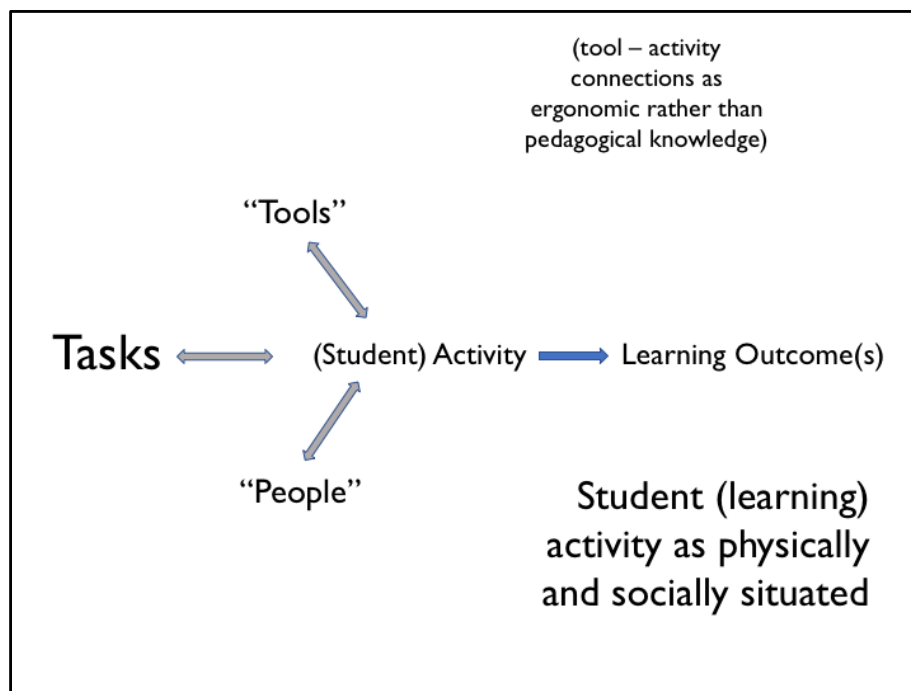
This is the simplest possible representation I can come up with of the educational design problem space. I've written about this extensively. In addition to the 2005 AJET paper (mentioned earlier) there are a few other open access papers (mentioned below). I've collated these and others for free download on my website. https://petergoodyear.net/2017/07/22/design-papers/

The figure above says simply that:
1. There are three main design components: the shorthand is "tasks, tools & people"
2. Good task design is usually the most important: get the task design wrong and everything else is likely to be wrong too; task design usually has the strongest influence of what students then do.
3. Activity is both physically and socially situated. The tools and artefacts that come to hand during the activity can have a profound (though often subtle) effect on what unfolds. Similarly, other people can shape what happens, even if they are not co-present. ('The social' is much bigger than this, of course.)
4. Design can say things about what tools (etc) are likely to be useful (given the task and the intended activity) and it can make recommendations about productive ways of working with others.
5. BUT – in their actual activity, students will interpret tasks and make some of their own decisions about what tools/resources to sue, who to work with and how….

Goodyear, P., & Dimitriadis, Y. (2013). In medias res: reframing design for learning. *Research in Learning Technology, 21*. doi:http://dx.doi.org/10.3402/rlt.v21i0.19909
Goodyear, P. (2015). Teaching as design. *HERDSA Review of Higher Education, 2*.
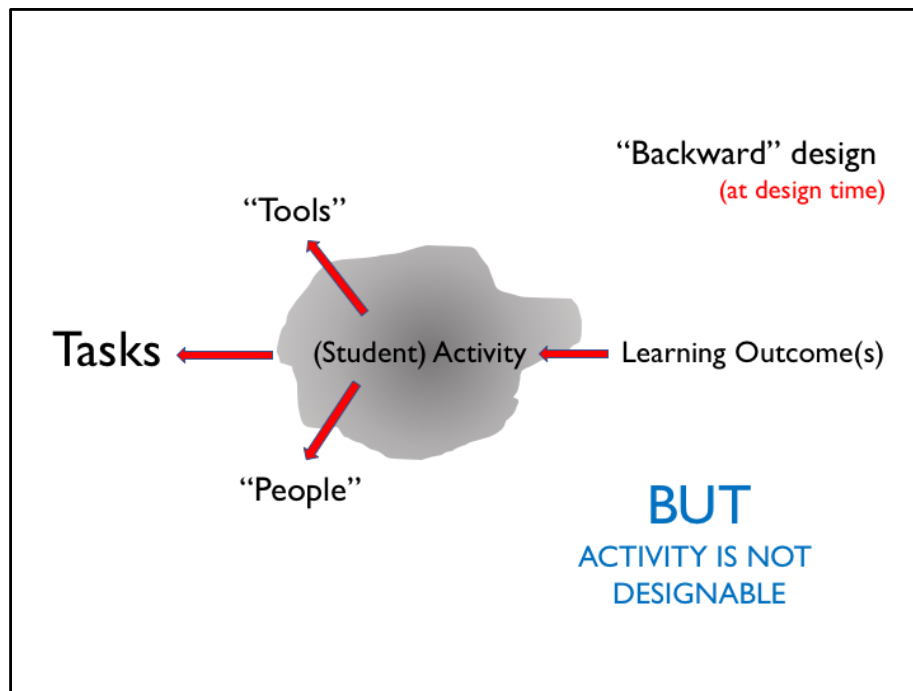
The previous slide schematised causal relations – design being an indirect practice whose effects on learning outcomes are mediated by what students actually do.

This diagram looks at things from a typical design timeline perspective – so called 'backwards design' (though it looks entirely logical and therefore 'forwards' to me)

Typically then, the design process starts by creating, refining and/or deciding on a set of intended learning outcomes, imagines student activity that is likely to align with those outcomes, creates task specifications that stand a good chance of stimulating and scaffolding the desired activity. Then, decisions are made about useful/necessary tools (material or digital or hybrid) and other kinds of useful resources. (This may include such things as designing or recommending particular (material or digital or hybrid) learning spaces. And design of the social includes such things as suggesting that students might work in pairs, or teams or as a CoP. (Of course 'people' can't be designed. It's just a useful but potentially confusing shorthand. Like 'learning design'.)

Crucially, the activity unfolds without much designer or teacher control & students consciously or unconsciously make decisions/choices about what to do, what to use, who to work with, and how.
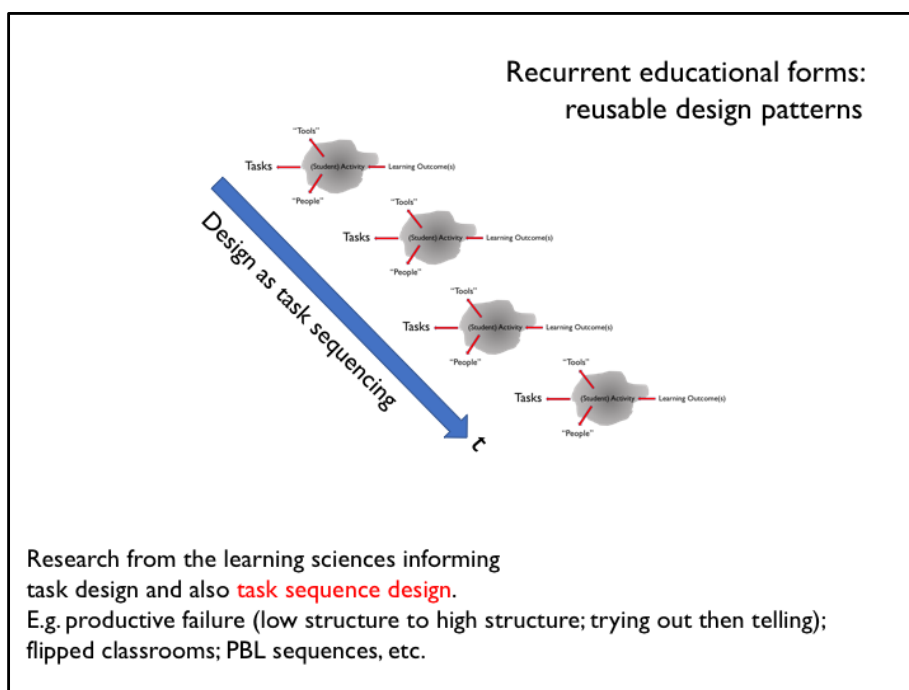
The simple diagram used in the last two slides may conceal the important point that task design usually involves sequencing a number of subtasks. (In other words, tasks are often 'compounds'.)

There's a growing body of useful research on sequencing tasks – e.g. in the area known as 'productive failure'. See for example the paper by Lai et al (below).

(Compound) tasks that turn out to have educational staying power can be captured and shared in a number of ways – one of these is through the use of design patterns and pattern languages (see Goodyear & Retalis)

Goodyear, P., & Retalis, S. (Eds.). (2010). *Technology-enhanced learning: design patterns and pattern languages*. Rotterdam: Sense Publishers. [the first chapter of this is available at https://petergoodyear.net/2017/07/22/design-papers/)

Lai, P. K., Portolese, A., & Jacobson, M. J. (2016). Does sequence matter? Productive failure and designing online authentic learning for process engineering. *British Journal of Educational technology*. doi:10.1111/bjet.12492
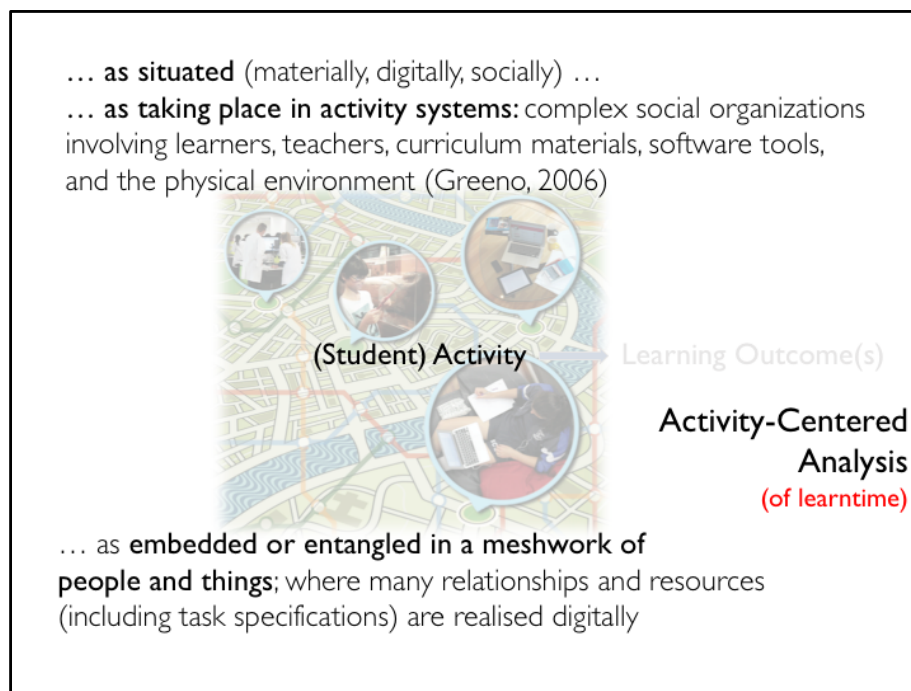
That was the view at 'design time'

We also need to think about how things look at 'learn time' – when the students are engaged in the activity itself.

Here, the design components are no longer separate – places, tools, artefacts, people, ideas, emotions become entangled.

How one tries to see into this complexity, and represent it, can depend on analytic preferences (or ontological choices).

For example, one may take a complex systems or ecological view. Or one may take a network/meshwork view. Or sometimes a mixture can work – though it usually make my brain hurt.

Carvalho, L., & Goodyear, P. (Eds.). (2014). *The architecture of productive learning networks*. New York: Routledge.
Carvalho, L., Goodyear, P., & de Laat, M. (Eds.). (2016). *Place-based spaces for networked learning*. New York: Routledge.
Greeno, J. (2006). Learning in activity. In K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 79-96). Cambridge: Cambridge University Press.
Greeno, J., & Engeström, Y. (2014). Learning in activity. In K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (2nd ed.). Cambridge: Cambridge University Press.

The dangers of trying to shortcut analysis:
there is no direct causal link between tool and outcome

Using laptops in class harms academic performance, study warns
Researchers say students who use computers score half a grade lower than those who write notes

April 4, 2017

By Jack Grove
Twitter: @jgro_the

At times, it can seem as if the march of technology in higher education is unstoppable. But using a laptop in class can significantly damage students' academic performance, a study warns.

The paper, based on an analysis of the grades of about 5,600 students at a private US liberal arts college, found that using a laptop appeared to harm the grades of male and low-performing students most significantly.

An illustration/by way

The Times Higher has tweeted about this topic a couple of times. I'm using it to illustrate my point about there being no direct link between (a) the presence of a tool and (b) learning outcomes. It so obvious when you say it like that – but it's clearly not obvious to writers at the THE.

Their summary clearly says: "using laptops in class harms academic performance, study warns"
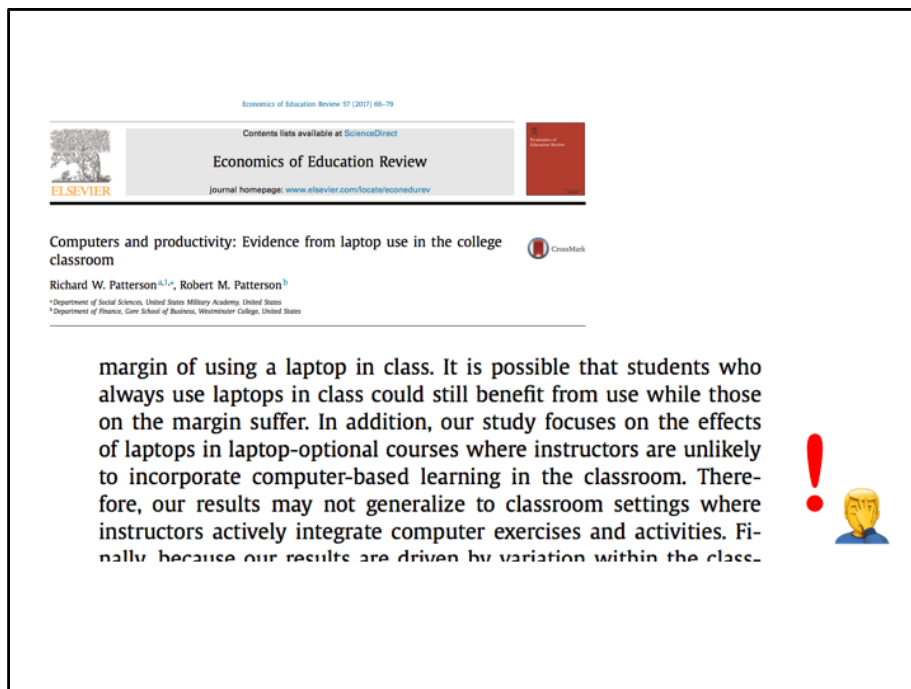
When one reads the actual article on which the THE report is based, one finds the following closing caveats:

"…our study focuses on the effects of laptops in laptop-optional courses where instructors are unlikely to incorporate computer-based learning in the classroom. Therefore, our results may not generalize to classroom settings where instructors actively integrate computer exercises and activities" (Patterson & Patterson, 2017, p77)

We don't know what students were actually doing with/on their laptops. Quite possibly a mixture of taking notes and checking Facebook. These two activities are likely to have very different effects on learning outcomes.

Patterson, R. W., & Patterson, R. M. (2017). Computers and productivity: Evidence from laptop use in the college classroom. *Economics of Education Review, 57*, 66-79.

Designing for smarter use of laptops in lectures

Teaching as Telling → Teaching as Facilitation

Learning by Listening → Learning by Doing

Teaching as Design → Teaching as Design

... of clear instructions & explanations (classic ID) → ... of tasks and environments

"Tools"

Tasks — (Student) Activity — Learning Outcome(s)

"People"

Tools
Notepad & Pen
Laptop

Activities & (Implied) Tasks

Posting on Facebook
Listening to the lecturer
Trying to understand key points
Making connections to own prior knowledge
Making notes on what the lecturer says
(Creating revision materials)

One of the misconceptions associated with talk about the shift to 'active learning' is that there is such a thing as passive learning.

In lectures (which are usually held up as the epitome of 'passive learning') students are actually likely to be doing a mix of things.

Some of these may be a response to an explicit task (e.g. 'make sure you write this down') but activity also flows from implied tasks.

The students using laptops in the Pattersons' study (as far as we can see) weren't told what to do with their laptops. Tasks were implied.

One could approach this differently and take a better design approach: if we want students to make good use of laptops in class, then we can suggest tasks that will help their understanding, retention, ability to create artefacts that are useful for revision, etc.

Three orders of learning
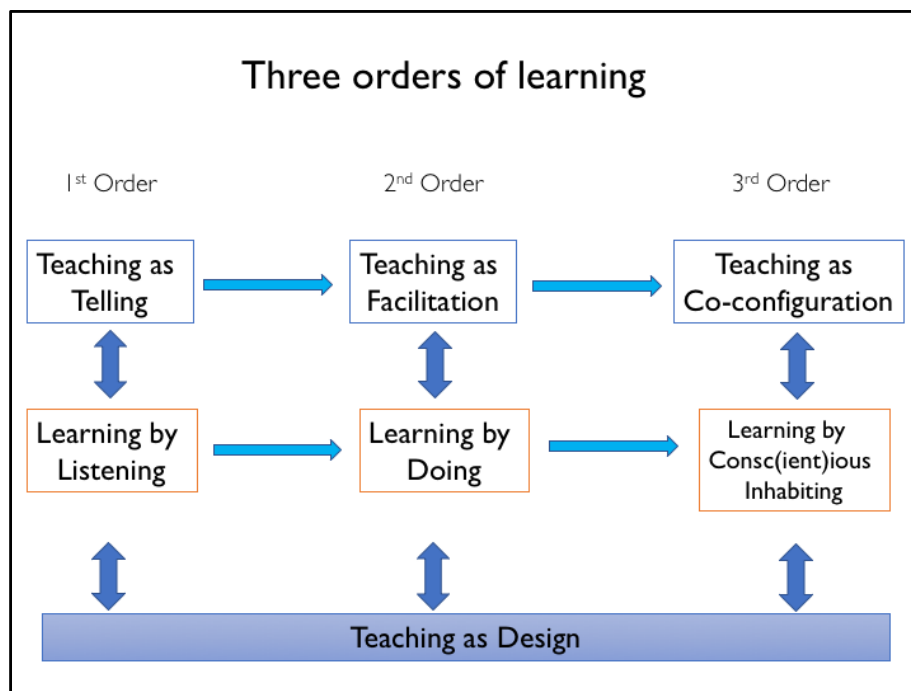
Back from that by-way.

My talk now sets out to extend the schema presented earlier, to include a 'third order' of learning, based on systems thinking, with complementary implications for design. From Markauskaite & Goodyear (2017) Ch20

The first-order perspective positions the learner as a system with no intrinsic capacity for learning – neither of skills nor for creating its own understanding. The teacher is the main architect and conductor of learning and the main source of knowledge. This may work reasonably well if the environment is stable and the teacher can identify gaps or misconceptions in the learner's knowledge. These can be remedied by appropriate variations on 'teaching as telling'.

The second-order perspective positions the learner as a system with an adaptive capacity for learning in response to changes in environment. The teacher is the main creator of environmental conditions conducive to learning; changes in environmental conditions prompt learning. This can work reasonably well in a changing environment, provided that there are appropriate scaffolds for learning. While the learner is engaged in 'learning by doing', the teacher monitors their activity, adds and removes scaffolds and provides hints, as they deem appropriate. This is 'teaching as facilitation' or 'teaching as orchestration'

The third-order perspective positions the learner as a system with intrinsic capacities for learning, including construction of new understandings and creating the conditions for its own learning. If a teacher is available, they act as a partner in co-configuring these conditions. However, the learner has the capacities needed to manage their own learning – part of the teacher's modus operandi must be to fade their participation over time, strengthening the learners' agency and capacity to (co)construct environments conducive to their own learning– knowing (and their capacity to do this with others). We can call this 'teaching as co-configuration'.

One can think of the teaching becoming more elaborate and inclusive as we move from left to right in the figure; the same is true for T-as-D: becoming more sophisticated and inclusive L to R

So we can now bring back in the theme of learning through/as inquiry, introduced near the beginning of the talk as one strategy for helping connect research and educational missions.

On this view, and taking into account the idea of 'three orders of learning' just mentioned, we can position design as having multiple objects, of increasing sophistication.

Acknowledging the need for students to learn to tackle 'wicked problems' means we need to (sometimes) design for learning situations in which they can learn how to design their own methods of inquiry. (There is more on this in Chapter 19 of the Markauskaite & Goodyear Epistemic Fluency book). NB this categorically does NOT mean that they have to discover how to do this for themselves. Good design can involve direct instruction and scaffolded inquiry, for example.

The list above also includes students learning to create environments conducive to working with others on 'design for change' – which is one important aspect of moral know-how.

Traditional teaching practices under increasing stress

Diversifying student needs and expectations

Rising expectations about graduate capabilities

Teaching as Design

Intensification of pressures on teaching staff

Accelerating technological change

Accumulating research evidence about successful learning and teaching
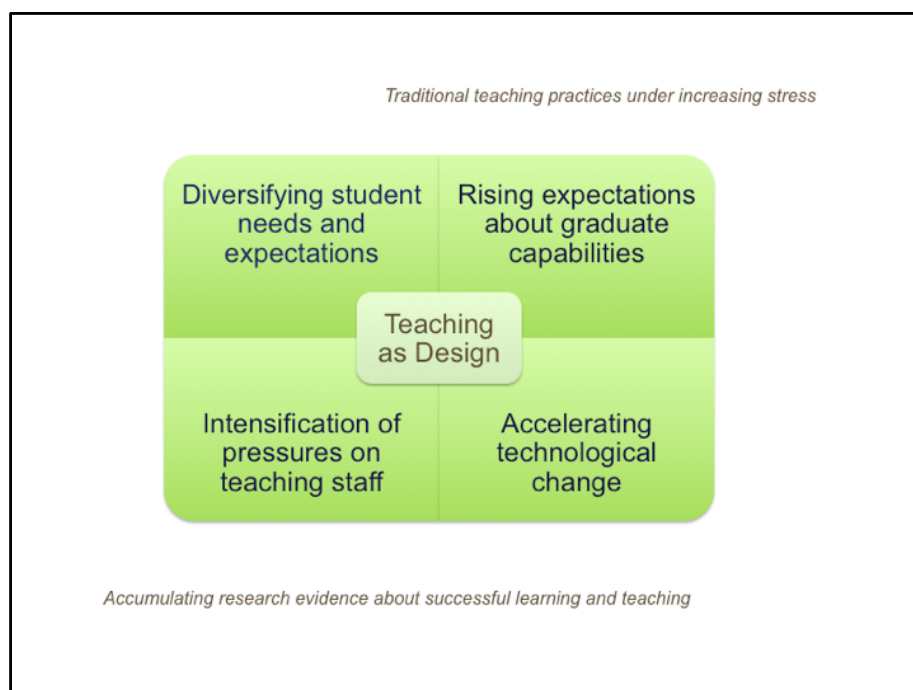
The talk up to this point may make it sound as if I am *advocating* take up of more designerly approaches in education – but I'm well aware that many well-meaning advocates have disappeared, ignored, in the wilderness. Advocacy is not enough. It is probably not even the best strategy.

I first created a version of the diagram above while I was working on an ALTC Senior Fellowship in 2008-9. It is meant to accompany an argument about the inability of traditional teaching to survive the pressures that are felt within universities these days. (By 'traditional teaching' I mean teaching as one was taught.)

In short, I see increasing the proportion of time spent on design (rather than live/interactive teaching) as an escape route or survival strategy. The very real forces sketched in the figure will squeeze educational work in this direction. If that is the future, then better ideas about design may make it a better future.

Stretching the argument a little further, one might say that changes in the world we share will need all of us to become better at designing – designing for understanding and for change. This means designing for students, so that (among other things) they can become better at designing themselves. It also means designing better environments for our own work – in research, service/outreach, collegial management, etc.

If we take this approach to designing what is good for our students, we should find it is good for us too.

This keynote began 30 minutes or so after the declaration of the results of the Australian 'postal survey' (a non-binding, voluntary referendum) on marriage equality. We knew the results were coming and were cheered by the outcomes. It would have been nice if the 'yes' vote had been as high as it was in Ireland (see picture) but it was a convincing 61%.

Image source: https://www.autostraddle.com/voting-yes-a-guide-to-the-irish-marriage-equality-referendum-290512/ check original site for rights.

Díobháil choibhneasta i dTuaisceart na hÉireann: dearcadh spásúil

(Relative Deprivation in the North of Ireland: a Spatial Perspective)

Peter Goodyear & David Eastwood (1977)
Geography Department, New University of Ulster

Annual Congress of Irish Geographers
University College Galway

I didn't have time on the day to finish with this personal story. This is a longer version of what I would have said.

I knew the results of the Australian survey on equal marriage rights would come out shortly before the keynote. In preparing the talk, I thought of the referendum in Ireland, and of comments by the Irish author Marian Keyes about how much the people of Ireland had changed in the last few decades – notwithstanding the entrenched power of a socially conservative theocracy.

I was also reminded that 40 years had elapsed since I gave my first ever academic presentation – some results from a PhD I'd been working on at what was then the New University of Ulster in Northern Ireland. (David Eastwood was my PhD supervisor. The conference was at UCG, where Irish was the language of instruction. All presenters were asked to offer the titles of their talks in both English and Irish.)

I was studying in Ireland for a mix of reasons. My mother's father was a Doherty from Donegal. His mother tongue was Irish. NUU was one of only two universities at that time offering courses in the new field of environmental science.

My PhD was a strange mix of social geography, the sociology of reference groups and methodological work on indicators of social, political and economic well-being. I never did get a permanent job as an academic geographer, but I'd learned some generic skills that were rare among social scientists at the time: I could do statistical analyses and write computer programs. By luck, I found a permanent job in an educational research department (Aston in Birmingham, 1979) and decided to start researching the

use of computers as tools to assist learning. A young researcher at Surrey called Diana Laurillard helped set me on this path.

Learning to learn, the new technologies and higher education:
towards an ergonomics of learning environments.
Keynote address,

Peter Goodyear, 1997
Department of Educational Research, Lancaster University, England

Annual Conference of the Dutch/Flemish Educational Research
Associations (ORD'97), Leuven, Belgium

That was 40 years ago.

20 years ago, I was asked by Erik de Corte – now Emeritus Professor of Educational Psychology at Leuven University – to keynote at the joint annual conference of the Dutch & Flemish educational research associations. He offered me a list of possible topics – learning to learn, IT and learning, innovation in higher education – and I foolishly took on all of them, and added my own spin.

The invitation coincided with a sabbatical. I'd just finished three years as head of department. I'd also led the Lancaster team creating the doctoral program in higher education, and had been teaching the module on Learning, Teaching and Assessment (with Peter Knight). Some of my research and publications had been in HE settings, but this was almost accidental. So I used the sabbatical and the invitation from Erik to take a new direction in my research, immersed myself in the HE literature, and developed some ideas that have stayed the distance.

Among these, I worked on a fusion of three apparently competing conceptions of the core purposes of higher education – academic, vocational and critical – using *epistemic fluency* as the common concern. Epistemic fluency had been discussed by Donald Morrison & Allan Collins in a book chapter the previous year – but primarily in the context of schooling. To my knowledge, it hadn't been worked out in any detail in HE contexts. It's finally had a serious treatment, strongly led by Lina Markauskaite, and published in our recent Epistemic Fluency book.

Goodyear, P., & Zenios, M. (2007). Discussion, collaborative knowledge work and epistemic fluency. *British Journal of Educational Studies, 55*(4), 351-368.

Markauskaite, L., & Goodyear, P. (2017). *Epistemic fluency and professional education: innovation, knowledgeable action and actionable knowledge*. Dordrecht: Springer.

Morrison, D., & Collins, A. (1996). Epistemic fluency and constructivist learning environments. In B. Wilson (Ed.), *Constructivist Learning Environments* (pp. 107-119). Englewood Cliffs, NJ: Educational Technology Publications.

Thank you

Contact & follow up
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http://petergoodyear.net

See also our Epistemic Fluency website: https://epistemicfluency.com