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Putting the pedagogic horse in front of the technology cart

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Abstract

This article explores what a pedagogy first model in learning and teaching in higher education looks like. It suggests that it is the pedagogy (the way we are going to teach) that we need to consider before we decide on the technology that we are going to use to enact our teaching. This paper first explains the different pedagogical approaches that are typically enacted within higher education today and then looks to see how, through that lens, we can choose different forms of technology to support our chosen teaching approaches. There is a strong emphasis placed on providing, active, collaborative and authentic learning experiences, particularly with the aid of technology, to afford those students studying at a distance, or through blended modes with comparable, if not better opportunities for engagement. The paper provides some great examples of what this can look like in practice, in the hope that others will find encouragement and inspiration from this.

Key words: Pedagogy, technology enhanced learning, higher education, pedagogy first model, Active Learning; Collaborative Learning, Authentic Learning.

Introduction

I am (allegorically) a lecturer in visual arts, I went to arts college and did well, so well that I was asked to be a tutor, then became a lecturer and now I'm a senior lecturer. Typically, I teach the way I was taught, and all seems fine to me, and most of my students seem to be doing OK. I have typically used a bit of a mastery model (stand and deliver) as my teaching approach, based in the studio. But I'm being asked to move more of my teaching online and I keep hearing from others in my faculty that we need to be considering things like 'constructive alignment' (whatever that means). Then, if I want to apply for promotion, at some point in the future, I need to be conscious and explicit about my teaching/pedagogical approach (whatever that means) particularly as I move to a more blended mode of delivery.

It is the opinion of the author, that this is not uncommon for university academics, who are teaching in more traditional ways, to feel puzzled when faced with the above scenario. Therefore, if we are going to ask our teachers to take a pedagogy first position, we need to first help them understand what pedagogy is, and particularly in the light of their disciplinary context; to help them start to see where they see themselves fitting within the plethora of different teaching approaches, theories and methodologies. This is largely because many of our teachers, at least in the higher education (university) sector, have not undertaken any formal teacher training, rather they have become discipline experts in a particular field due to the depth of research they have undertaken, and thus been deemed to be suitable to teach on those grounds (Cervini , 2014).

Because we are thinkers and love reason in Higher Education (HE) and like to pay honour to what has gone before, we actually have to be very clear about the ontological and epistemological positions we assume in relation to our pedagogy. In other words, understanding what the relationships (to the world) that we are forming between the concepts, categories, subject and the domain of knowledge that we teach are; otherwise known as ontology (Sugumaran, 2016). But in doing this, it is also important to bear in-mind that this positioning of our understanding is largely formed by us assuming a posture in relation to our theories of knowledge, especially as they relate to the teaching methods we knowingly (or not) choose to adopt. It therefore behoves us to understand the distinction between justified belief and opinion; of which this is otherwise known as epistemology (Steup, 2018). In simpler terms, we are looking to establish a meta cognitive understanding of what we want to achieve in our teaching, how we will achieve it and why we want to (choose to) do it in a particular way.

We have simplified this over recent times to simply call this 'Pedagogy', and in very general terms, refers to the interactions between teachers, students, and the learning environment and the learning tasks in and around that environment (Beutel, 2010). And broadly it's how teachers and students relate to each other, as well as the instructional approaches we implement.

What is pedagogy?

So, if I were to say, 'our curriculum shall use a pedagogical approach', really, nowadays, are we still largely talking about 'Constructivism', which became popularised in higher education from the late 1960's (Amineh & Asl, 2015)? Yes and No. As it is my contention that pedagogy, today, is utilising a much broader range of different teaching and learning approaches / theories / methodologies that we can draw on when the needs arise. In reality, we have developed out of necessity a far more eclectic approach to pedagogy (though some purists remain), not dissimilar to the end of postmodern as a formal philosophical construct (though some purists remain). Where, in place of these former (more traditional) theories there exists now new paradigms of authority and knowledge formed by the pressure imposed on us by both new technologies and contemporary social forces (Kirby, 2006).

I kind of liken it to having a full set of golf clubs. I know if the hole/pin is 260 meters down the fairway, that I will start with using my 2 wood, then depending on how that goes I will either have to use my 5 or 6 iron to get onto the green, then if I'm lucky enough (more luck than good technique) I get to use my putter and get my par 4. The next hole is only 180 meters so I will use a different combination of clubs, but I will always get to use my putter. At the end of the day I have a full set of clubs at my disposal, so all my contingencies are covered. This analogy could be likened to different techniques within one methodology, but that would limit me far too much. So, there may be a few things we need to consider.

Pedagogic strategies (the ones instructional designers like to talk about) are based on general learning theoretical concepts: Behaviorism, Instructivism, Cognitivism, Constructionism, Constructivism, Socio-Constructivism, Situated Learning, Connectivism, etc. There is often an overlap between these theories that explain how people learn and how one could bring (help) people to learn. But I have seen over the years, we often put this under the one catch-all category, or the banner of Constructivism, but it's much more than that. It's kind of like saying 'Pedagogy' when it's so much more than that.

On top of this, we also have theories about how we teach different cohorts of students. Generally speaking, Pedagogy is used when we talk about school teaching, in the classroom, and we talk about Andragogy when we talk about teaching adults in the classroom. But more recently, as teaching has become more blended and online, we have had to find new terms to represent the teaching strategies we need to employ in these new environments. So new words (concepts) have started to emerge like Heutagogy and Paragogy.

Table 1 and Table 2 below provide a brief summary of, what are light heartedly referred to as, the ...ism's and ...ogy's of modern-day education. That is, the theories of learning behaviours (or ...ism's) and the popular learning strategies (or ...ogy's) that have very broadly defined learning and teaching over the last century.

Table 1. Definitions of some general learning theories or learning behaviours (or ...ism's)

Theoretical concepts	Definition
Behaviorism	A psychology-grounded pedagogical model proposing that learning is influenced solely by physical variables such as environmental or material underpinning. It suggests that free will is an artifice and that responses can be determined and conditioned. (Reimann, 2018)
Instructivism	Proposes that there is an external reality that, we as learners, need to comprehend. This is based in two dynamics, 1) that the teacher is the primary agent of learning and that their knowledge forms the foundation of instruction; 2) the act of teaching is about changing students' behaviour (learning) towards a new, agreed better state. (Crosslin, 2016)
Cognitivism	Learning comes about by forming mental processes or making associations that influence the way we think. Meaningful learning occurs through organisation and elaboration of information, where teachers will ask prompting questions to help students refine their thinking or recognise where they may be wrong. (Ertmer & Newby, 2013)
Constructionism	A student-centered model where you construct mental models to understand the world around us, by using information we know to acquire more. It is usually hands-on, through project-based work where you are active in making real world objects. The teacher acts as a facilitator or coach rather than taking a posture as a lecturer. (Alesandrini & Larson, 2002)
Constructivism	We construct knowledge and meaning from our experiences, where learning is active. In other words, we actively construct or create our own subjective representations of our objective reality. New information is linked and added to prior knowledge, so that mental representations are individualised and owned by the learner. (Crosslin, 2016)
Socio-constructivism	The emphasis is on the collaborative nature of learning in a cultural and social context, where cognition, or sense making originates in and around social interaction. So, it is more than an assimilation of new knowledge, it requires learners to integrate into a knowledge community and thereby co-create knowledge. (Amineh & Asl, 2015)
Situated learning	A focus on how we acquire professional skills, somewhat like an apprenticeship model, where sincere tangential participation leads to an affiliation with a community of practice. It takes as its focus the relationship between learning and the condition in which it occurs. (Lave & Wenger, 1991)

Connectivism	A learning theory explaining how Internet-based technologies have created new opportunities for us to learn and share information. It suggests that learning happens across online peer networks, where the teacher guide us to information to help us share and learn on our own. (Crosslin, 2016)
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Design of learning and teaching strategies draws a lot from general pedagogical theory, but also from specialized research, such as understanding Heutagogy, Paragogy, Andragogy, etc. And these additional ways of considering different cohorts of learners help us to understand how we will implement different technologies to meet our learning goals.

Table 2 Definitions of three of the more popular learning and teaching strategies

Theory	Definition
Andragogy	A theory of adult learning that describes some ways in which we, as adults learn differently from children. For instance, we tend to be more self-directed, internally driven, and more ready to learn. Teachers can draw on ideas of andragogy to increase the success of their adult learning programs. (Blondy, 2007)
Heutagogy	A theory of self-determined learning with its roots in andragogy, and where learners are highly autonomous. It emphasises the development of one’s capacity to prepare for the complexities of today’s workplace. Particularly applicable for instruction using newer technologies such as social media. (Blaschke, 2012)
Paragogy	A theory addressing the challenge of peer-production in the context for self-directed learning. It is based on connection between peers in the digital era and focuses on analysing and co-creating the educational setting with one’s peers, sharing their learning situations and experiences. (Herlo, 2014).

Towards a pedagogy first model

Educational technology has been a driving force to develop new strategies, informed by many of the above learning theories, with the basic assumption that educational technologies can facilitate pedagogical scenarios. However, often we have tried to fit the pedagogical intent for what we are trying to teach, in after having chosen a tool to teach it with (because we like the tool), instead of using the pedagogy as the reason for adopting a particular tool (as this tool helps me apply my pedagogy). It’s been kind of like putting the cart before the horse (please excuse my Photoshop skills).



Figure 1. The technology cart before the pedagogic horse (metaphor)

For example, if we are talking about creating Active Learning opportunities in the online space, first we look at what we mean by Active Learning, what we hope to achieve through implementing an active learning strategy and then how do we do this, and with what tools. We don't start with the tool, though to some degree the tool itself may suggest it would be a good fit, if an active learning strategy were adopted. So, if engaging students in the process of learning and getting them to reflect on this in their context is what we are aiming for as an 'active learning' strategy, then this leads us to think that things like active discussions, live debates, problem solving and case-based learning, simulations and role playing, peer teaching and team projects, may all be strategies to adopt. If that is our starting point, then we look at the tools that could help make this happen. The following is a simplified version of what this then leads us to consider.

Table 3. Active Learning approaches and tools

Active learning	Active discussions	O365 Teams, discussion and voice boards, Zoom sessions, Chat (e.g. yammer), Instant messaging (e.g. WhatsApp), etc
	Live debates	Video conferencing; Zoom, Bb Collaborate, Skype, (or the like), etc.
	Problem solving	Mind mapping tools, O365 Teams, Wikis, Padlet, Answer Garden, etc.
	Case-based learning	O365 Teams, video sharing, social bookmarking, Video conferencing (or the like), Evernote, etc.
	Simulations	360 Video, AR/VR/MR/XR, Smart Sparrow, H5P, etc
	Role playing	ePortfolio, Voice Thread, video sharing, etc.
	Peer teaching	O365 Teams, LMS, Video conferencing (or the like), Wiki, etc
	Team projects	O365 Teams, Google Docs, Voice Thread, ePortfolio, etc

In the online space, in practice, if we are wanting to foster more active, authentic and collaborative approaches to help our students learn more effectively in preparation for the future of work, we must first ask what we want to achieve, then look for the right tools to help us do this.

Let us tease this out in a bit more detail, to see what this might look like in practice. The following three examples will look at three approaches that focus first on the teaching strategy, then on which tools may best fit this strategy. The three strategies we will focus on here are, Active Learning, Collaborative Learning and Authentic Learning and draw on example of practice from Griffith University, in Australia, found in the Explore Learning and Teaching database (ExLNT) found at: <https://app.secure.griffith.edu.au/exlnt/> ExLNT is a catalogue of over 330 online entries maintained by the Learning Futures Department at Griffith University in Australia. The content is designed to be used by academic staff to provide stimulus to enhance their learning and teaching practice and is freely open to the public.

Active learning

Active Learning is where you engage students on an analytical level. It seeks to facilitate students to assimilate material and information rather than passively absorbing it through traditional lectures. Although there are many definitions of Active Learning, the definition used by the University of Michigan (2016) is very helpful. They suggest that, Active Learning is the process of learning whereby students engage in activities, such as reading, writing, discussion, or problem solving that in turn promote analysis, synthesis, and evaluation. When students are actively learning they are using higher order thinking skills. By designing tasks that require students to be active, they are also being encouraged to take a deep approach to learning which can impact on their learning in a positive way.

For example, Active Learning could be facilitated in a variety of ways, such as your students being able to:

- Create, share, and comment on images, PowerPoint presentations, videos, audio files, documents, PDFs, etc.
- Co-facilitate meaningful discussions, thereby co-constructing knowledge.
- Providing opportunities for student self-reflection and reflection on others work
- Empowered to conduct group discussion, or together, through engaging with each other (not with the teacher) come to a common understanding of some of the key elements of knowledge required to meet their course outcomes.

These activities can typically be enhanced by the use of technology. Some examples of this include:

- Using a tool such as VoiceThread for virtual question and answer based scenarios. Information about this can be found at: <https://app.secure.griffith.edu.au/exlnt/entry/5186/view>
- Using PebblePad (or ePortfolio tool) to support reflection for active learning, to help learning become more personal and give students more ownership over their learning. Information about this may be found at: <https://app.secure.griffith.edu.au/exlnt/entry/4305/view>
- Using polling type tools such as Echo360 (ALP) to help with identifying points of confusion, or on reflection. It enables lecturers to meet students' immediate needs and produce opportunities for deeper learning. Information about this may be found at: <https://app.secure.griffith.edu.au/exlnt/entry/5207/view>
- Using H5P to create interactive activities, to get students engaged with the content and practice formative learning events. These types of activities help students to think critically within the contextual frame of the learning space itself. Not dissimilar to what you would

expect to see on a dynamic web-page, but surfaced within the LMS. There are some great examples for using H5P found at: <https://learningandteaching-navitas.com/using-h5p-active-learning-opportunity-content/>

Example:

Now, briefly reassuming my (allegorical) position as a lecturer in visual arts, I am wanting my students to make considered and helpful peer commentary on other students work and to engage in this in an asynchronous way, so as not to put people on the spot. So, I need to look for a tool that allows the student to display their work and provide some words (aural and/or written) in support of that work. The tool then needs to allow other students from that cohort to provide a commentary on that work (aural and/or written) and to actively engage in the commentary others are making. Once the students have had a good chance to comment on each others work, and the original student has potentially modified their work, I then want them to reflect on that experience in some kind of journal entry, that the other students can also see, and importantly, be able to submit for assessment. In this case I may choose to use two tools; VoiceThread and the Journal Tool in PebblePad as I can then link from the reflective piece back to the VoiceThread and vice versa. This combination of tools has allowed my students to actively participate in the co-creation of new knowledge through engagement at multiple levels.

Collaborative

Collaborative Learning generally relies on engaging group structures to support students working together while maximising Individual learning. It is an educational approach that involves two or more people learning or attempting to learn something together, allowing them to capitalise on one another's resources and skills (Chiu, 2000). For example, some of the following strategies could be integrated into your teaching program to encourage students to become involved, which can in-turn provide a valuable source of motivation for your students. They include, but are not limited to:

- Peer modelling and getting students to roleplay
- A physical or online Scavenger Hunt for information related to the topic of the week
- Formal or informal debates on a given topic
- Pass the Problem, where students partly answer and pass the problem onto to the next student to add more details.
- Forming Groups Creatively, where students brainstorm solutions to particular problems

Similarly, many of these activities can be easily facilitated in the online space, both synchronously and asynchronously, such as:

- Using Collaborate Ultra (or another online virtual classroom tool) to form Breakout Groups. It allows staff and students to: share files, to annotate across the group, raise your hand to ask a question, send notifications either to everybody or among students, use video, have chat, and to provide polling opportunities. In this tool students can roleplay and the teacher can model practice. Information about this may be found at: <https://app.secure.griffith.edu.au/exInt/entry/847/view>
- In the topic for the week, you ask your students to find 5-10 websites that contain information related to that topic. Students get to share these links with each other and comment on the relevance to their course of study. This could be done on a wiki page in the LMS or in a tool like Office 365 Teams and OneNote. Ideas about this may be found at: <https://education.microsoft.com/Story/Lesson?token=ZXwll>

- Formal or informal debates can be hosted through a range of systems and run synchronously through Zoom or Collaborate, or asynchronously through a tool such as Voice Thread. The most important thing is, that learning occurs when students are encouraged to explore their assumptions and beliefs (epistemologies) about current knowledge and being able to articulate this to others, then be encouraged to consider other's views. An example of this using Voice Thread is found at: <https://app.secure.griffith.edu.au/exInt/entry/8548/view>
- Pass the problem is where you form your online groups and give each group a case or a problem and ask them to identify the first step in solving the problem. You then rotate this to the next group and have them identify the next step, and so on until the problem is addressed fully. This can be done in discussion forums in the LMS or in any tool that you can set up teams. See: <https://app.secure.griffith.edu.au/exInt/entry/4565/view>
- Padlet is a tool that can allow Groups Creatively, where students brainstorm solutions to particular problems. It is a web application featuring a virtual wall where students can collaborate and post media. This can be useful for teaching and learning to encourage collaboration and sharing. See: <https://app.secure.griffith.edu.au/exInt/entry/5306/view>

Example

Again, briefly reassuming my (allegorical) position as a lecturer in visual arts, I am wanting my students to debate the virtues of one of the 'old masters'. In this case I have students on two campuses but wanting them to collaborate with each other in two teams, as you would in a normal debate. So, I need a tool that students can collaborate separately in their groups, in the first instance to plan their strategy, and then come together in the formal timed debate in a synchronous online environment. It would also be good if I could record this so that students could re-watch it and reflect on the pros and cons of the arguments. This means it would be good if the tool I choose has some breakout rooms to allow for the planning, that it had some form of timer and allowed me to record. There are a number of tools on the market that will do this. I could do this with Blackboard Collaborate (or the like), I could also do this in Microsoft Teams using both text and synchronous video. Both would do the job well, but the Teams scenario may also allow for the follow-up reflection activity. The group work is obviously collaborative, but this would be enhanced by the opportunity to critically analyses the debate after the fact, by reviewing the video, which has the added benefit of reinforcing the key points of the debate for the students.

Authentic

Authentic Learning is learning best done through gaining experience - learning by doing rather than learning by listening or observing (Pearce, 2016). It is an approach that allows students to discuss and explore concepts as well as construct concepts and discover relationships that involve the real world that are relevant to the student. So generally speaking, they are learning activities that relate to the real world; Ones where students are able and encouraged to critically think and evaluate information and data. The benefits of this include enhancing learning within their context by allowing students to gain knowledge while building a professional identity and also participating in meaningful activities. It is important to expose students to various settings and activities as well as perspectives. By allowing students the opportunity to collaborate, and practice skills in their various environments will also enhance learning and build capacity.

Authentic learning experiences include activities that have:

- Relevance to real life

- A problem that is ill-defined and not easily solvable
- Tasks that allow for a sustained investigation
- Allow for multiple sources and perspectives
- Collaboration (addressed above)
- Reflection
- Perspectives from various disciplines
- Assessment that is integrated
- Creation of products
- Problems that have many possible solutions and outcomes.

These are example experiences that you may be able to use in your context:

- It's important to provide relevance and give students experience in techniques that are often quite challenging and require an experienced hand to ensure success. For example, to help student engagement in laboratory classes, a series of videos can be used to increase the level of awareness needed before entering that domain. See for example how providing this content 24/7 can do this at: <https://app.secure.griffith.edu.au/exInt/entry/7528/view>
- An ePortfolio that consists of a learning journal or lab journal can help students share authentic reflections. Students would make weekly entries to reflect on and reinforce the concepts from the lectures and labs. The ePortfolio entries can be graded and feedback provided from the teaching team. For example: <https://app.secure.griffith.edu.au/exInt/entry/7148/view>
- Wikipedia entries are often authored by multiple authors. In tools such as O365 OneNote or a Wiki within an LMS students can design to develop research, written communication, and referencing skills. Importantly, the piece must be evidence-based and the information must be defensible. The activity can be used to scaffold longer and more significant scholarly tasks. It can also be used as a piece of assessment. An example of this may be found at: <https://app.secure.griffith.edu.au/exInt/entry/8268/view>
- Using a combination of tools in concert such as Collaborate Ultra (video conferencing) to allow students at a distance meet synchronously in groups, linked with the use of Social Media tools such as O365 Yammer to participate asynchronously to build a sense of community. This is where hashtags can be used for each week's topic so that students can easily refer to specific topics throughout the course. For example: <https://app.secure.griffith.edu.au/exInt/entry/6345/view> and <https://app.secure.griffith.edu.au/exInt/entry/7169/view>
- Aviation students' reflecting in PebblePad (ePortfolio) through scaffolded learning experiences while using Microsoft Flight Simulator X Steam Edition. This is discussed at: <https://app.secure.griffith.edu.au/exInt/entry/7128/view>

Example

And now for the last time, reassuming my (allegorical) position as a lecturer in visual arts, I am wanting my students to understand how they should approach a gallery owner who potentially will take them under their wing and sell their work for them in the future. To do this I want each student to go out and interview one gallery owner using a set of pre-determined questions that the class and lecturer have agreed on. The student then needs to be able to share this video with other members of the class, along with a short summary of what they themselves learned about the gallery and the process, providing hints for others who may do a similar thing in the future. They also need to have a portfolio of their work ready to show the gallery owner and leave with them (preferably in an electronic form). One tool that would allow this to happen would be an ePortfolio tool such as PebblePad, but others would do it too. It would allow students to upload or feed a video to their

page so that the other students can view it. It would also allow them to provide a commentary about the experience. Of course, the ePortfolio tool is the perfect tool to also allow the student to create their online collection of their work that allows the gallery owner to access at any time, via a discreet link (so that it doesn't have to be open to the public). This real life experience is then reflected on and an artefact remains for future reference.

These are just some examples of how a pedagogical problem has been resolved by using technology to engage students studying at a distance or through blended modes of delivery.

Conclusion

This article has explored a range of scenarios that would provide some clues as to how to consider the importance of a pedagogy first model to support learning and teaching in higher education. It has demonstrated that it is important to consider the pedagogy (the way we are going to teach) before we decide on the technology that we are going to use to enact our teaching. The theoretical models that inform, or underpin a range of pedagogical approaches were briefly investigated; some of which, when enacted in different teaching paradigms provide a lens through which we can choose different forms of technology to support our chosen teaching model. There is a strong emphasis placed on providing, active, collaborative and authentic learning experiences in this paper, particularly when aided by a range of technology solutions, to provide those students studying at a distance, or through blended modes with comparable opportunities for engagement. The temptation to put the technology cart before the pedagogic horse is quite understandable, as some technologies can offer some great solutions for staff and students to engage and collaborate. So much so, that sometime the reason for why we are using a particular tool can be overlooked or not considered. To help place a practical focus on this paper, it has provided a range of examples of what this can look like in practice and links to many online resources, in the hope that others will find encouragement and inspiration from this.

So now, as the allegoric teacher in visual arts, I can now see that there may just be some other ways that I can approach this act of teaching, that may be more helpful to my students who are studying online or in a blended mode. It has helped me to consider that there may be more ways to think about my approach to what was, in my lexicon, 'pedagogy', and that really, now, I need to be considering other approaches that may better fit with today's cohorts of students. This new consciousness can help me be more explicit about my teaching/pedagogical approach (as I now know what that means) particularly as I move to use more technology in my online and blended modes of delivery.

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