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Factors that shape pedagogical practices in next generation learning spaces

Factors that shape pedagogical practices in next generation learning spaces

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Abstract

International figures on university expenditure on the development of next generation learning spaces (NGLS) are not readily available but anecdote suggests that simply retrofitting an existing classroom as an NGLS conservatively costs \$AUD200,000, while developing new NGLS buildings often cost in the region of \$100 million dollars and over the last five years, many universities in Australia, Europe and North America have developed new buildings. Despite this considerable investment, it appears that the full potential of these spaces is not being realised.

While researchers argue that a more student centred learning approach to teaching has inspired the design of next generation learning spaces (NGLS) (Tom, Voss, & Scheetz, 2008), and that changed spaces change practice (Joint Information Systems Committee, 2009) when 'confronted' with a NGLS for the first time, anecdotes suggest that many academics resort to teaching as they have always taught and as they were taught. This chapter highlights factors that influence teaching practices, showing that they are to be found in the external, organisational and personal domains.

We argue that in order to fully realise significant improvements in student outcomes through the sector's investment in NGLS, universities need to provide holistic and systematic support across three domains – the external, the organisational and the personal domains, by changing policies, systems, procedures and localised practices to better facilitate changes in teaching practices that maximize the potential of NGLS.

Introduction

Since the 1990s, the higher education sector has been enamoured with the potential of technology to transform education, in terms of student learning, the pedagogical practices of teachers, and the finances of institutions. In more recent times, technology is being combined with innovative learning spaces to support more participative approaches to face to face learning in higher education institutions. In this chapter we focus on teacher pedagogical practices in next generation learning spaces and the factors that shape the pedagogical choices academics make and that influence their capacity to change those practices.

The integration of participatory pedagogical practices into next generation learning spaces

Recent research suggests that best practice pedagogy in NGLS demonstrates the transformative use of technology and space, and incorporates socio-constructivist approaches to learning and teaching (Oblinger, 2005). Ways of teaching that reflect socio-constructivist epistemologies of learning have been developed since the early part of the 20th century through the social constructivism theories of Lev Vygotsky (1934), John Dewey's (1956) views on learning through solving problems that involve exploration and experiences, and ideas around collaborative and cooperative learning espoused by Johnson (1975) to name but a few. Such approaches to learning and teaching that have participation rather than teacher exposition and student information 'acquisition' as the pedagogical basis were largely developed in a non-technological era but have been appropriated by proponents of NGLS as those most likely to be effective partners in technology enriched NGLS.

In essence, NGLS provide opportunities for transformation of practices, that is, significant modification and redefinition of practices, rather than merely augmenting existing teaching practices (Fluck, 2010). Arguably existing practices tend to be

dominated by teacher exposition, information transmission and reliance on textbooks, or '*broadcast pedagogies*' (Rowan & Bigum, 2008). Instead, transformative pedagogies in NGLS may be characterised by students working collaboratively on complex, real world problems; including people and resources from beyond the physical classroom; requiring students to take more responsibility for what and how they learn; and by academics providing greater differentiation of tasks and approaches to suit the individual learners' needs (Fluck, 2010). Recent work on the 'flipped classroom' in which lectures are provided as digital recordings and the lecture time used for students to actively collaborate with peers to explore challenging aspects of the topic of study (Khan, 2011).

However, for many academics such pedagogical practices represent a significant shift from current practice (Georgina & Olsen, 2008). Modification and redefinition of practices requires extensive scholarly support as well as a consideration of the contextual factors that act to shape the choices academics make regarding their teaching, and it is to these factors that we now turn.

Domains of influence

A study of the education literature (higher/vocational/secondary education) suggests that the following three intertwined domains influence the pedagogical choices of academics:

- The **external** domain – where academics and universities operate within a broader, societal context that shapes how they perform teaching practices
- The **organisational** domain – where academics are part of a collective, negotiating their identity as a community/discipline member and part of the material practices of an organisation.
- The individual, **personal** domain - where academics endeavour to reconcile their beliefs, knowledge and skills about learning, teaching and technology garnered from formal and informal education with ways of enacting teaching in practice.

In this chapter we argue that these domains act in concert and at times in messy ways to influence the pedagogical practices that academics adopt when teaching in NGLS. We discuss the influences on academic pedagogical practices that emerge from the wider societal and policy context. The chapter also discusses the tendency for higher education pedagogical practices to be reproduced rather than transformed, as more experienced academics from within the discipline resist developing new pedagogical practices. Further, we discuss the effects generated by the materiality of higher education – the physical spaces, artefacts and organisational structures and localized policies and the interplay of these elements that shape the ways and the extent to which academics change their pedagogical practices in NGLS.

In Figure 1 below we outline a model illustrating the factors that we believe shape pedagogical practices in NGLS. The model highlights the messiness of teaching practices as they are performed and how a broader range of factors intersect and interact to generate powerful effects that act on the dispositions and capacities of academics to integrate technology, student collaboration, peer learning and other socio-constructivist approaches into the pedagogical practices they adopt within NGLS.

Factors that shape pedagogical practices in next generation learning spaces

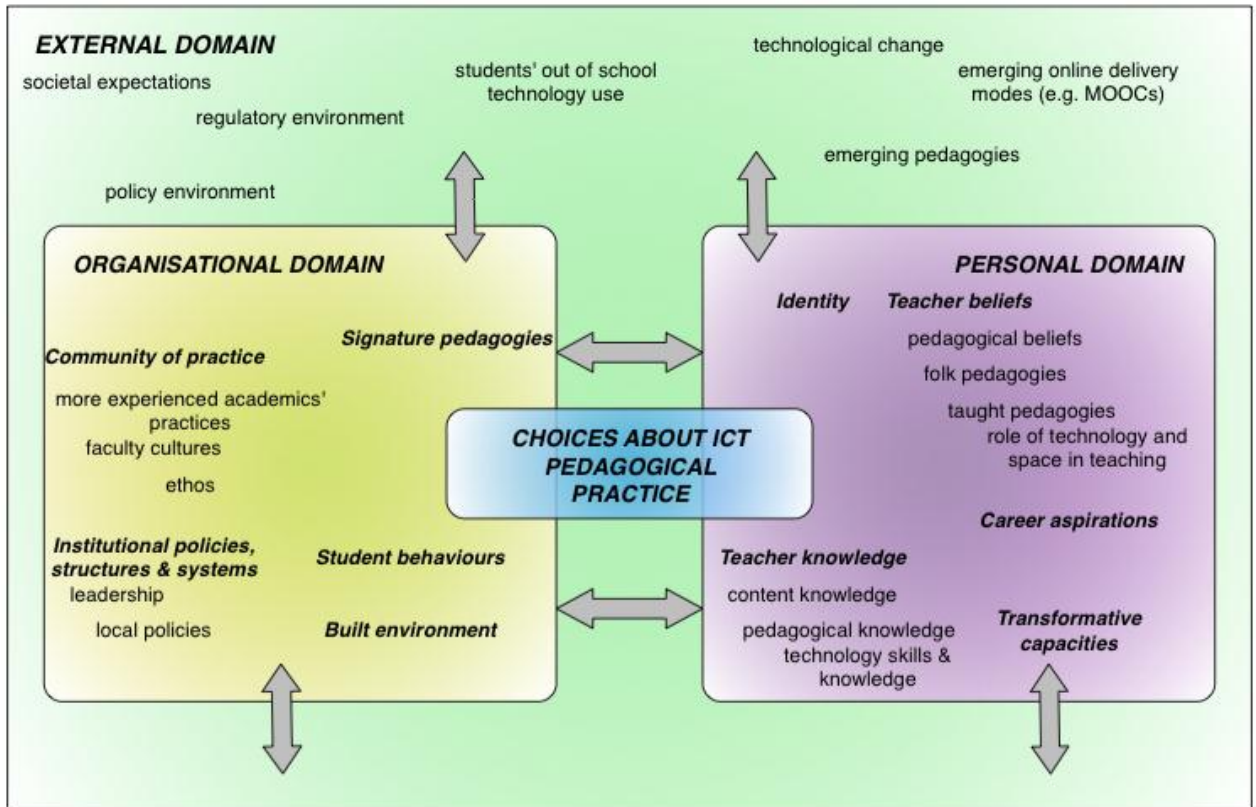


Figure 1. Interrelated factors that influence pedagogical practices in NGLS

The External Domain

All practices, those of individual academics as well as those of higher education institutions, take place within a broad, external environment where factors not immediately part of that practice still have an impact on that practice. Higher education is subject to a range of factors that operate in the external environment and ultimately impact to varying extents on teaching practice in both positive and negative ways. They collectively provide the broad, underlying platform upon which pedagogical practices are enacted. In the current climate, this platform is characterised by far-reaching change and fundamental transformation.

In this section we discuss the following elements that form the external environment in which universities operate, and their impact on teaching practice in NGLS:

- societal and student expectations of higher education with respect to technology;
- policy environment and the potential impact this has on teaching practices; and
- technological change and new pedagogies that emerge as a result.

Societal and student expectations

Very few areas of society are immune to the influence and impact of technology in the 21st century. Technology is perceived by many to be an instrument of better quality education, despite little hard evidence to support this magic bullet claim (Nnazor, 2009). Such is the belief in the potential of technology that society and those who employ university graduates expect universities to use the latest available technology and teaching practices, in the belief that graduates will receive a better

quality education and will be conversant in the ways that industry makes use of technology.

Students also expect higher education institutions to offer technologically-enriched learning experiences and access to appropriate technology and spaces that will enable them to develop the necessary skills and know-how to enable them to function effectively and productively in a technologically dominated world. Increasingly young people expect to be able to use technology to support their studies (Rasmussen, Davidson-Shivers, & Savenye, 2011). Young people tend to be relatively high users of technology, both in terms of the range of technologies they use and the kinds of technological activities they engage with (Eynon & Malmberg, 2011). Students also bring technology with them into higher education. Anecdotally, many academics acknowledge the need to embrace technology in their own practices if for no other reason than the significant role that technology plays in the lives of their students.

Some researchers argue that current students are digital natives for whom technology is just a part of the fabric of life, there to make life easier and better, or in most cases, just there, just how things are now done (Bennett, Maton, & Kervin, 2008; Prensky, 2012). To people like Prensky, members of this next generation of learners have different learning characteristics to other generations, they learn at 'twitch speed', crave interactivity and prefer visual modes of learning (Prensky, 2012).

However, arguments about digital natives are predicated on the assumption that young people have comparatively universal and uniform digital upbringings (Kennedy, Judd, Churchward, & Krause, 2008). On the contrary, there is evidence of diversity in access, ability and predispositions among young people towards using technology (Kennedy, Krause, Judd, Churchward, & Gray, 2006) that students' competencies are superficial and hide ineffectiveness and shallow uses of technology (Lei, 2009).

Within this societal context of student technology use, is our modern day reality of constantly changing technology.

Technological change and subsequent emerging pedagogies

New devices and software applications bombard us on a daily basis. This environment of rapid technological change impacts universities and academics and their ability to keep pace with technology, let alone develop and implement new pedagogies that integrate technology.

NGLS bring with them opportunities to do things in classrooms that were previously inconceivable, or to do the same things in fundamentally different ways. The combination of technologies and new approaches to designing learning spaces brings opportunities for new pedagogical practices. These emerging pedagogies represent new ways of teaching but may be ill-defined or not fully developed as teachers at the leading edge of teaching in NGLS explore new practices. Emerging pedagogies that capitalise on the affordances of NGLS might challenge (some) academics' conventional pedagogical practices. At the very least they sit in the background as a potential threat to conventional pedagogical practices, or provide opportunities for teachers to take a new approach to pedagogy in their classrooms.

Universities once held the role as the originators and keepers of knowledge, but in a connected 21st century world, with information increasingly freely available online, people have the opportunity to

construct knowledge without the benefit of educators. The democratization of information and the trend to more online delivery of content through informal and formal mechanisms such as massive open online courses (MOOCs) pose challenges to more traditional bricks and mortar delivery of higher education. The development of NGLS as a way of delivering a rich, on-campus experiences is one response to the threats from online delivery of courses from other higher education institutions and online providers (Ernst & Young, 2013).

Within the broad societal context of changing technology and student use of technology, universities operate in a national regulatory and policy environment.

Policy Environment

Government policy directly or indirectly impacts strategic initiatives in higher education including the development of NGLS and the associated integration of technology, often determining the parameters of such initiatives through laws, regulations and the allocation of funds (Nnazor, 2009). Shifts in policies that shape the delivery of higher education can impact on practices, in both positive and negative ways.

The particular Australian policies that can be seen to influence the use of technology and change in pedagogical practices in NGLS are:

- Higher Education funding;
- The National Broadband Network;
- policies relating to increased participation and access to higher education; and
- accountability requirements.

Recent changes to Higher Education funding policies in Australia have resulted in far greater competition for prospective students amongst universities that is unlikely to be reversed (Ernst & Young, 2012). In response, universities are seeking ways to differentiate their offerings to prospective students. Being seen to be at the forefront of technological advances is one strategy being adopted by some universities, through the promotion of NGLS and technology integration.

On top of the competition for students, budgetary constraints in universities resulting from Government funding cuts and, in Australia, reduced demand for fee paying places by offshore international students (Lane, 2012) are pressures to increase efficiency and productivity, translating into larger class sizes (Rasmussen et al., 2011). NGLS are seen to offer greater flexibility in accommodating larger class sizes without compromising the quality of student learning.

Further, policy shifts have recently emphasised the need for universities to accommodate a more diverse student population, with a particular emphasis on including more students from disadvantaged backgrounds. At the same time, the student profile has shifted – universities are teaching an increasingly diverse student population: students from Non English speaking backgrounds, students with a disability, students from multiple generations, first in family students, international and indigenous students. A more diverse student population brings the need for additional supports to be provided by universities, placing more pressure on academic staff to accommodate more diverse learning needs (Rasmussen et al., 2011) and an increased focus on retention strategies. Such pressures may reduce the time academic staff has to explore and develop new pedagogical practices in NGLS. Alternatively, NGLS may offer pedagogical possibilities that are more suited to the diverse student population.

The higher education sector in Australia is increasingly being subjected to increased surveillance and accountability (Webb, 2009). The language of universities has shifted from the mission of universities as places of a learned community focused on teaching, research, knowledge-building and service, to that of efficiency, productivity and accountability (Rasmussen et al., 2011). Teaching quality and student experiences are used to measure the efficacy and viability of higher education programs, as well as the performance of individual academics. The increased compliance burden of reporting and evidence requirements associated with performance evaluation and career advancement may reduce the time academics have available to explore new pedagogical practices in NGLS. Alternatively, the increased prominence of accountability measures may act as an incentive to academics to develop new pedagogical practices and NGLS as ways of responding to student feedback and to improve student retention.

In addition to factors that operate from outside higher education institutions, are those factors that are particular to the organisation itself.

The Organisational Domain

So far our discussion of factors that shape the pedagogical practices and use of technology by academics teaching in NGLS has focused on the external domain, a set of factors that operate beyond higher education but that nonetheless form the broader context in which academics teach. However, in any discussion of pedagogical practices that best make use of NGLS, it is important to consider not just the broad environment in which academics operate, but also the organisational and material context - the strategies, policies, structures, systems, resources, leadership, discipline groupings and communities of practice - that mediate pedagogical practices in the institution's physical spaces (Somekh, 2010). A university can be seen as an assemblage of diverse elements of texts, bodies, spaces and things (Fenwick & Edwards, 2010). All of the elements that make up the assemblage play a role in shaping how other elements within the assemblage perform.

In this section we discuss the following institutional elements and their impact on changing teaching practices when teaching in NGLS:

- Institutional policies, structures and systems
- Built environment
- Communities of practice
- Signature pedagogies

Institutional strategies, policies, structures and systems

Societal expectations in education, outlined in the previous section, are reflected in broad national and state education policies as well as in institutional policies. National policies regarding the uncapping of undergraduate student places have resulted in some universities strategically targeting significant increases in student numbers in particular programs. Arguably, the increase in student numbers has had an impact on staff-student ratios (Larkins, 2011) resourcing and possibly even pedagogical practices. Obvious teaching practices that often change when academics teach increasing numbers of students are those of assessment and of 'mode of delivery'. Academics often resort to exams and multiple-choice tests when faced with large numbers of students and very tight grading timelines. They also employ the large lecture format to cope with increasing numbers of students. In both cases, these practices appear to be antithetical to collaborative learning

environments in which student skills as well as knowledge are developed and assessed.

Internal policies within many universities, place an emphasis on the transformative potential of technology enriched NGLS. As indicated in this volume by Ling and Fraser (2014), senior university leaders feel the pressure to be seen to be keeping pace with innovations in learning spaces and technologies. The development of NGLS are seen in some institutions to foster a 'cutting edge' reputation and provide the institution with a competitive advantage in attracting students. However, providing the buildings does not necessarily lead to transformative pedagogic practices. While senior leaders may well set the direction of the institution, academics enjoy relative autonomy within their own classrooms. Consideration needs to be given to the culture in which academics teach, including their incentives and support for changing their practices.

At a different institutional level, systems such as timetabling processes that determine which teachers are allocated to NGLS also shape the extent to which these spaces are used to provide collaborative, technology enriched learning opportunities. It would seem logical that those teachers with a higher predisposition to teaching in these ways might be timetabled into those spaces. However, this is not always a consideration in the timetabling process. Anecdotally academics who would dearly love to teach in new spaces aren't timetabled into them, while staff who are timetabled into them have been known to express their concern that the spaces don't support how they teach (i.e. didactically).

Built environment

Many if not most classrooms in a typical university comprise rows of tables facing the front of the room where the teacher's table is positioned at the head of a room in front of a whiteboard and projection screen. Such a built environment conveys strong constraining messages about the type of teaching that takes place in the space (Oblinger, 2005). These spaces reify traditional pedagogical practices where the academic, who is the focal point of the classroom, transfers information and instructions either by writing notes on whiteboards or via PowerPoint presentations to the relatively passive students (Chism, 2006). Instruction is undifferentiated teacher exposition. These spaces passively discourage the use of more social constructivist participatory pedagogical practices and the integration of technology.

Such practices are not consistent with best practice pedagogy that make the most of the opportunities offered by technology, which emphasise a more active role by the student in creating personalised learning rather than passively consuming information (refer to Keppel's chapter in this volume).

In the last decade, many universities have invested significantly in the building of NGLS that are technologically enabled and designed to promote active, collaborative and peer-based approaches to learning (Brown, 2005; Joint Information Systems Committee, 2009; Oblinger, 2005; Steel & Andrews, 2012). While authors argue that a more student centred learning approach to teaching has inspired the design of NGLS (Tom et al., 2008) and that changed spaces change practice (Joint Information Systems Committee, 2009), Lee and Tan (2011) note that there is little evidence that changes in spaces effect long-term change in practice saying that in the literature to date (2011), "...there are no details regarding the interaction of space and teaching practice, curriculum and students" (ibid. 12). They go on to say that the sector needs to engage in long term evaluations to determine if a changed space changes teaching practices, perspectives and activities.

While academics may not teach in the ways that NGLS foster, as universities retrofit old spaces and build new spaces, academics at least have the opportunity to take advantage of the space to provide collaborative, active, technology enabled learning opportunities. To do so, academics need the barriers described in this chapter to be removed and they need professional learning support, as discussed by in the chapters in this volume by Hall and Palaskas and de la Harpe and Mason.

Having discussed the built environment, and its potential impact on pedagogy, we turn now to consider the impact of the community of practice in which academics work and learn.

The disciplinary community of practice and signature pedagogies

When someone learns a practice he is initiated into the traditions of a community of practitioners and the practice world they inhabit. He learns their conventions, constraints, languages...their repertoire of exemplars, systematic knowledge and patterns of knowing-in-action. (Schon, 1987, pp.36-37)

Communities of practice and senior leadership

Organisations, via their leadership, can play a significant role in aligning national goals, organisational goals and community of practice goals. Institutional leaders play an important role in interpreting and translating national policy or making sense of the policy at the level of the institution, that is positioning new policies within an organisational narrative or vision about how the institution works and what it does (Ball, Maguire, & Braun, 2012).

Good leaders are those who can displace cherished misconceptions and '*mistaken beliefs*' (Dede, 1993, p.24) through creating and communicating a compelling alternative to current paradigms and practices. Leaders therefore have the potential to indirectly shape practices by developing and negotiating goals that are common to the organisation and to the communities of practice that exist within the organisation.

Change, such as the transformative pedagogical practices in NGLS that this chapter discusses, requires its champions and advocates in the face of competing institutional expectations and counter discourses that may emanate from dominant communities of practice.

Champions need to be well regarded by members of the community of practice in order to have influence over the community's practices. They need to be '*charismatic individuals*' who can overcome resistance that the new innovation can provoke within an organisation (Rogers, 2003).

In communities of practice theory, groups of people who share a common set of problems or passions, such as academics, also share a repertoire of actions, styles, artefacts, discourses and stories and ultimately share a common sense of identity. Learning a practice involves taking on the conventions and '*rules*' of that practice. According to Lave and Wenger (1991), newcomers to a community of practice learn that practice at the metaphoric feet of the more established and experienced members of that practice (Lave & Wenger, 1991), gradually taking on the approaches of their more experienced peers. Learning a practice is seen as inseparable from the doing of the practice. Learning how to perform the practice of teaching takes place within the context of a community of more experienced teachers. Within a university, learning to teach inevitably occurs within one's disciplinary context.

If senior members of the discipline, including program directors who lead teaching teams and program curriculum design and renewal, teach in didactic and teacher centred ways, it is arguably more difficult for newer academics within those teams to adopt participatory pedagogical practices. We can imagine that discussions in staff rooms and staff meetings may not engender the embracing of transformative pedagogical practices. Resistance by senior discipline academics and counter politics generate powerful effects, as colleagues, particularly new entrants to the profession, are influenced by the proponents of the counter-discourses.

Senior academics and discipline leaders have the opportunity to develop a discipline culture that encourages the adoption of scholarly teaching practices. Scholarly teaching refers to the ongoing learning of academics and occurs when they reflect on their teaching practices, engage with the pedagogic literature on teaching and learning relevant to their discipline, and use this as a basis for making improvements to their own teaching (Lueddeke, 2003; Richlin, 2001). The application of new knowledge about teaching and learning by the teacher is one of the end products of scholarly teaching. The purpose of engaging *in* scholarly teaching is to continually improve the activity of teaching and associated student learning. On the other hand, engaging in the scholarship of teaching "...results in a formal, peer-reviewed communication in [an] appropriate media or venue, which then becomes part of the knowledge base of teaching and learning in higher education" (Richlin, 2001, p.58).

In a discipline culture that supports scholarly teaching practices, we can imagine the collaborative development of a shared vision around the types of participatory pedagogical practices that best support learning and teaching in NGLS that might occur, providing a compelling alternative to traditional, teacher centred practices.

Signature pedagogies

Signature pedagogies (Shulman, 2005) refer to the 'types of teaching that organise the fundamental ways in which future practitioners are educated for their new professions' (p.52). Signature pedagogies are the 'modes of teaching and learning that are...replicated in nearly all the institutions that educate in those domains' (p. 54), that is the approaches to teaching and learning in particular disciplines that we immediately identify with and intuitively come to expect. Signature pedagogies implicitly define what counts as knowledge in a field and how things become known. Such pedagogies are not always explicit; rather they incorporate the tacit conventions and rules of thumb that have taken hold within the discipline. For example, the quasi-Socratic interactions between teacher and students in a law faculty; the bedside teaching involving the triad of patient, clinician and students in medicine; the blackboard full of mathematical representations of physical processes typical in engineering; and so forth (Shulman, 2005).

As newcomers to a profession adjust to their professional roles they engage in 'role prototyping' (Ibarra, 1999), observing role models and learning the tacit rules and ways of being in the profession are part of the process of socialisation. They experiment with and adopt provisional identities based on the role models around them as part of the process of becoming an accepted member of that community (Scanlon, 2011).

We contend that, if the dominant teaching practice in a discipline reflects a strong focus on information transmission and teacher as expert, new academics will be socialised into existing, entrenched teaching practices, the traditional signature pedagogies. A key characteristic of signature pedagogies is that they routinise significant components of pedagogy (Shulman, 2005). Teaching is complex and

challenging and at times overwhelming, especially for new entrants to the profession and for those for whom teaching is not their primary discipline. Adopting signature pedagogies simplifies the challenge of teaching since once they are learned and internalised, they require little thought; rather they become habitual, tacit practices.

However, as Shulman (2005) points out 'habits are both marvellous scaffolds for complex behaviours as well as dangerous sources of rigidity and preservation' (p.56). Conformity can bring about an emphasis on reproduction of practice rather than any transformation of that practice. As Britzman (2003) argues:

Conformity is more than uniformity of thought and standardisation of activity. Conformity diminishes prospects of becoming something other than what has previously been established. In this sense, the forces of conformity are repressive...Conformity privileges routinised behaviour over critical action. Its centripetal force pulls toward reproducing the status quo as it mediates our subjective capacity to intervene in the world. (p. 46)

In a sense, the pedagogical practices of academics can be extremely durable, or even sedimented (Youdell, 2010). Attempts to introduce new ideas can be strongly resisted by senior academics. It is therefore essential for discipline leadership to overcome defensiveness and a culture of conformity about pedagogical practices, in order to develop a culture of continuous critical reflection, or scholarly teaching, by academics.

Our discussion of what shapes the pedagogical practices of academics teaching in NGLS has so far focused on those factors that stem from what we refer to as the external and organisational domains. We argue that there is a third domain, the personal domain, which focuses particularly on the role of the individual academic in changing their teaching practices.

Personal domain

A range of factors that operate at the individual level is thought to significantly influence the extent to which, and the ways in which, academics are prepared to adopt new teaching practices in NGLS that emphasise technology integration. These factors centre on teacher beliefs, teacher knowledge and capacities to transform practice.

In this section we discuss the following personal elements and their impact on changing teaching practice when teaching in NGLS:

- teacher beliefs about pedagogy and about NGLS;
- teacher knowledge;
- teacher capacity; and
- career aspirations and identity.

Teacher beliefs

There is a body of literature that argues that beliefs about a practice are a more important determinant of what people actually do in a practice than knowledge about that practice. Beliefs about a practice inform attitudes to that practice (Belland, 2009). Pajares (1992) posits that beliefs are formed early and tend to self-perpetuate, and the earlier a belief is formed the more difficult it is to alter. Beliefs help individuals define and understand the world and themselves.

Beliefs and knowledge are inextricably linked but beliefs have a stronger affective component, which makes them a lens through which new experiences and

information are filtered. This filtering system screens, redefines, distorts or reshapes subsequent thought processes. Beliefs about pedagogy are therefore necessary to consider.

Beliefs and knowledge about pedagogy

Some studies suggest that, rather than change their practices to take advantage of the affordances of NGLS, academics will use a NGLS in ways that fit with and sustain their existing pedagogical practices (Howell, 2007). Bain & McNaught argue that there is a distinct contrast in the literature between academics who think of learning as reproducing established knowledge and those who think of learning as the outcome of an understanding process (Bain & McNaught, 2006). For example, those who believe that students learn best through teacher-delivered lectures will lean towards using technology and NGLS to facilitate this type of learning, whereas those who believe in exploratory and collaborative learning will use technology and spaces quite differently to support more participative learning experiences. However, Bain and McNaught's own study suggests that such a binary does not reflect the complexity of decision making about how academics integrate technology, or the variation in beliefs about learning and teaching held by academics (Bain & McNaught, 2006).

A significant proportion of people who teach in higher education do not come from an education or teaching background. They are experts in their field, highly knowledgeable about their particular discipline; they are often researchers, adept at investigating the world around them, and many have neither a background in teaching nor formal teacher education (Kane, Sandretto, & Heath, 2002). However, all academics have first-hand experiences in being taught, based on their own experiences as school students and as higher education students. Bruner (1996) termed the beliefs about learning and teaching that develop as a result of our personal experiences of education 'folk pedagogies'. Bruner argues that teachers act on these folk pedagogies rather than any professed beliefs about learning and teaching; such is the strength of influence of personal experiences as students. Our own experiences as learners provide a road map for our experiences as teachers. The folk pedagogies of the majority of academic staff in higher education are likely to have been characterised by a strong focus on the lecturer as the fountain of knowledge, with information transmission the order of the day. That is, the majority of academic staff would have experienced very traditional pedagogies in their own higher education experience. It therefore follows that, in the absence of alternative models of teaching that are more suited to the affordances of NGLS, academics may revert to the sort of pedagogical practices that dominated their own experiences as higher education students.

However, whilst potentially an important influence, folk pedagogies are not necessarily a determinant of practice. They may influence the pedagogical practices of an academic but they do not necessarily determine such practices and the degree to which practices are influenced by folk pedagogies may vary. Other factors may act as countervailing influences.

The folk pedagogies developed by academics can be influenced by further experiences of NGLS and technology through exposure to propositional knowledge about innovative or transformative pedagogical practices through formal or informal professional learning programs undertaken by academics. In other words, folk pedagogies are potentially replaced with or modified by taught pedagogies, that is, the beliefs about pedagogies that teachers develop as a result of professional learning activities and their further experiences.

Changes in beliefs tend to follow changes in behaviour, rather than precede them (Gusky, 2002; Pajares, 1992). That is, academics do not believe it until they see/do it. Changes in belief are influenced most strongly by personal success in the relevant domain, through prolonged and deeply engaging experiences, as well as by vicarious experiences, that is, seeing success occur for others that allows for comparison with our own experiences (Pajares, 1992). Thus, it could be expected that observation or first-hand experience of teaching in NGLS could also provide opportunities for experiences that might influence or shift beliefs about the role of spaces in pedagogies. However, academics have traditionally had limited opportunity to observe other academics' practices, suggesting that opportunities for supporting and celebrating experimentation with new approaches to teaching in NGLS are important in helping to shape academics' beliefs and self-efficacy in relation to technology-enabled teaching spaces (Ertmer & Ottenbreit-Leftwich, 2010).

Beliefs and confidence about using NGLS

Another important set of beliefs that influence or shape an academic's teaching practice in NGLS is their belief in their own ability to use the affordances of these spaces effectively. Bandura (2000) argues that belief of personal efficacy is the foundation of human agency, that is, unless people believe that they can produce desired effects by their actions, they have little incentive to act. Self-efficacy is based on beliefs about what a person can accomplish with the skills and knowledge they already possess (Preston, Cox, & Cox, 2000).

Technology forms an integral part of NGLS, either in the form of technology that is integrated into these spaces, or in the form of technology devices that students increasingly bring with them into these spaces. Technology thus forms part of the landscape of learning and teaching in NGLS and offers opportunities for new approaches to teaching practices. However, when academics are unfamiliar with technology, or lack confidence in their ability to make effective use of the technology within an NGLS, then practices are unlikely to change. Academics who are confident in their ability to adapt their pedagogical practices and to use the technology that is an integral part of an NGLS will have more positive attitudes towards teaching in such spaces than those who are less confident or resistant to changing practices (Ertmer & Ottenbreit-Leftwich, 2010).

Teacher knowledge

Attitudes about the role technology and space can have on learning and teaching are also influenced by teacher knowledge. Literature related to the integration of technology into teaching in the schools sector has been dominated in recent years by the TPACK model, a theoretical framework for conceptualising the relationship between technology and teaching (Mishra & Koehler, 2006). More recently, the TPACK model is being applied to those who teach in the higher education sector (Rienties, Brouwer, & Lygo-Baker, 2013). TPACK focuses on the synergies and dynamic interconnections between technological, pedagogical and content knowledge. That is, teachers need to know the content of what they teach (CK), have a generic understanding of the processes and practices of teaching (PK), have understanding and mastery of specific technologies (TK), and have understanding the challenges students are likely to experience as they learn the content (PCK). Importantly the TPACK model identifies the importance of knowing how teaching and learning might change with the use of particular technologies (TPK) (Koehler & Mishra, 2008). Effective teaching therefore occurs at the intersection of these knowledge domains, suggesting that improvements in teaching will result if academics' knowledge about pedagogy and technology in particular is improved in relation to the content they teach.

Capacities, not just knowledge

However, a conceptualisation of what it takes for teachers to teach effectively in NGLS needs to go beyond a focus on teacher knowledge, in whatever form (Law, 2008). Academics need to move beyond using NGLS and their associated technologies to sustain or strengthen current pedagogical practices, to teach in NGLS in ways that disrupt or subvert current pedagogical practices, and create new pedagogical practices. To leverage NGLS for innovative pedagogical practices and to use NGLS in ways that are transformative, academics need additional capacities not discussed in the TPACK model. Making use of the affordances of new tools and spaces depends upon the development of a vision of what might be possible. To foster a more participatory, collaborative, non-hierarchical pedagogy requires not only cognitive but social-metacognitive capacities on the part of the academic to work in more reflective and connected ways with colleagues in what is increasingly knowledge building in a community (Scardamalia, 2002). Finally, to leverage NGLS in innovative and transformative ways, academics need courage and motivation, a social-emotional capacity, to teach in ways that are unfamiliar. That is, to use NGLS in ways that are transformative, subversive or disruptive that result in new practices, academics need more than knowledge. They need a range of capacities, personal and organisational, that support their risk taking.

Career aspirations and identity

The age groups of tenured and continuing academics in higher education are skewed towards the older end of the spectrum (Bexley, James, & Arkoudis, 2011) with a significant proportion of academics approaching retirement age in the near future. Anecdotally the majority of late career academics appear much less comfortable with the role of technology in their teaching than their younger counterparts, are concerned about changing expectations of students, and feel that the higher education sector is not moving in a direction with which they identify (Bexley et al., 2011). There is little incentive for these academics to make the sorts of changes to their teaching practices that are afforded by NGLS.

Further, the emphasis on research outputs in higher education generates a belief that teaching is not sufficiently valued (Bexley et al., 2011). When institutional priorities are placed on research activity, academics may be less likely to devote the time and energies needed to make substantial changes to their teaching practices, instead preferring to build their research capacity. The perception among academics is that career rewards are more likely to flow from discipline research activities rather than from teaching practices.

Further, higher education institutions in Australia employ a high proportion of teaching staff in casual or sessional capacities (May, Strachan, Broadbent, & Peetz, 2011). Casual and sessional academics generally have limited access to the support and professional development opportunities around NGLS and technologies afforded to ongoing academics. Thus there may be a 'lost generation' of academics who miss the boat of training and development of new pedagogical practices associated with NGLS.

In conclusion

The factors that influence the pedagogical practices that we use in NGLS are complex and many (Figure 1). As we have seen from the preceding sections of the chapter, building the spaces does not ensure that academics will use pedagogical practices that the spaces were intended to support. Universities that wish to support

academics to teach in pedagogically sound ways in NGLS need to do so holistically and systematically, across a number of areas including:

- providing the support and incentives for schools, departments and faculties to develop scholarly teaching cultures and evaluating and improving those cultures
- identifying, fostering and rewarding champions of pedagogical change
- aligning institutional policies, structures, systems and resources to maximise the affordances of NGLS
- requiring evidence of improved pedagogical practices and improved student learning outcomes for promotion and in recruitment, probation, and annual performance management reviews
- ensuring that NGLS are used by staff who want to teach in them
- developing course and unit guide templates and systems to foster collaborative learning outcomes
- providing and expecting academics who teach to engage in continuing professional learning opportunities.

If the goals of improving the learning experience of students through transformed teaching practices in NGLS are to be realised, then universities need to pay attention to the complex range of factors, both large and small, across the external, organisational and personal domains.

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