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Chaos and calm in the lecture theatre: Transforming the lecture by creating and sustaining interactivity at scale

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2026 Introduction

I wrote this essay in late 2022 as the university sector rapidly pivoted back to face-to-face learning after the end of the COVID-19 pandemic, dispatching everything we learnt about online learning to reams of research published about the 'dark times' of crisis or as Thomas et al., (2023) referred it 'the plague years'. Little did we know that AI would compound this evisceration of online learning, returning assessment to analogue (for students) and challenging the ongoing efficacy of online and blended learning. The problem has been compounded by the series of legal challenges brought by UK students seeking compensation for their experiences during the pandemic (Weale, 2026) and further entrenching the view that online learning is cheaper, worth less and is inferior to face-to-face.

In early 2023, I studied different forms of immersive spaces across contexts. During the pandemic, interactivity and connection (or lack thereof) became central to the student experience. Zoom classrooms enabled backchannels of chat, but also created the sea of black cameos that promulgated furious anger amongst many academics (Hermanrud et al., 2023). When Australian universities returned to campus teaching in 2022, the snapback was vicious and immediate (something I wrote about in a different essay at the time) (Bryant, 2022). Lecture theatres filled up again with students (at least for the first few weeks), and the old habits of teaching were dusted off. One thing that never recovered though was student engagement. Whilst there was public demand for lectures, attendance and engagement said otherwise. The cost-of-living crisis exacerbated this disengagement with students reducing study loads and relying on technological fixes as a counter to the complicated work/life balance time pressures (recordings, AI etc). In 2026, that engagement crisis has become existential (Mansi, 2026). Navigating timetabling conflicts with the desire to maximise social engagement (especially when factoring in commuting time and cost) has been a key factor in determining attendance and engagement (Galli, 2025).

As an educator, I passionately believe that connection is critical to the human condition and is the backbone of the capabilities and possibilities of learning in higher education. Reverting to the old ways post-pandemic (a mistake repeated post-AI with the uncritical reliance on pen and paper exams) cemented the fracturing of the student experience, still damaged by remote learning and social distancing. But what if you could at a very simple level, break the spaces that institutionalise connection as a one-way stream, information out and only repeated back under controlled circumstances? What if you could maximise opportunities for social interaction, at scale?

The results of my exploration of immersive spaces reinforced my hypothesis that spaces could be used, broken and overlaid to create a more authentic, challenging and connected learning experience. We imagined creative solutions to the architectural and experiential entrenchments of lecture spaces. Could

you redesign a lecture theatre using a kit-type layer of light touch technology? Could changing the dynamics of the space (for example, changing audience/performer perspectives? We looked at high-touch immersive systems using cutting edge Hollywood movie making technology. But at the epistemic heart of these interventions was the idea that connection-making is complex, uncertain, and personal. How can university spaces become fertile catalysts for connection? Over the last few decades, the sector has tried things like in-the-round spaces, collaboration studios and furniture interventions that create flexibility. But what if the architecture is only a fraction of the structural jigsaw puzzle needed for connected learning? How important is the environment, the pedagogical intent, the emotional and human soul of the design? Immersion and implosion became the two key words of this work because immersion can trigger emotional and perceptual shifts in engagement, implosion is where we blow up the structures (metaphorically). But more importantly, I landed on the notions of calm and chaos, quiet and loud to represent that connection is not a single beat, or a monotone, but a bright, splashy messy Jackson Pollock of a thing.

Editorial notes

This essay was first published on the Disruptive Innovations in Business education blog in three parts in February/March 2023. For this working paper, I have updated references, added new content and expanded the rationale for the critical arguments. I have also added a short postscript on a cutting-edge learning space designed by the University of Sydney Business School based on the principles shared in this essay.

Other publications connected to this essay

- Bryant, P. (2023). Immersion and implosion: Enabling social spaces through the design of interactivity at scale. Ubiquity Proceedings, 3(1). https://doi.org/10.5334/uproc.82
- Bryant, P. (2024). Mediating connection at scale through space design: The University of Sydney Business School CONNECTspace. ASCILITE Publications, 180-190.
- Bryant, P. (2024). Planning and designing for teaching and learning at scale. In How to Use Digital Learning with Confidence and Creativity (pp. 127-132). Edward Elgar Publishing.
- Bryant, P., & Alderton, Z. (2026). CONNECTSpace Project: Final Report.
- Peterson, S., Brock, A., Huber, E., & Bryant, P. (2022). At Scale Immersive Learning 'Events'. Disruptive Innovations in Business Education https://diberg.blog/2022/11/28/live-education-events/

Introduction

The efficacy of lectures as a mode of delivery has been a long-debated practice in the design of teaching and learning in higher education, despite its relatively ubiquitous status as the at-scale pedagogy *de rigueur* for most institutions (Crawford & Parsell, 2025; Gibbs, 1982; Nordmann et al., 2022). Successive waves of often transient pedagogical change have challenged the effectiveness of the mode and future of the centuries-old lecture itself (see studies on the rapid emergence and dismissal of flipped learning such as Bredow et al., (2021) and Kapur, et al., (2022)). Yet the lecture continues to thrive as one of the most dominant aspects of the modern education experience. It continues to be one of the defining stereotypes of the university journey, reinforced in popular culture, and one where expectation does not equal reality (Schei et al., 2018).

In the academic literature and played out in the mainstream media there have been passionate defences of 'traditional' lectures highlighting how they provide structure, scaffolding and contribute a sense of identity and belonging as a university student (see French & Kennedy (2017) and Kaur (2023). Even in the wake of an experience of unprecedented potency in the form of the COVID-19 pandemic, where lectures were replaced *en masse* with video conferencing, chunked content and asynchronous broadcasts, the central tendency momentums of higher education reinstated the lecture form, reopened closed lecture theatres and have institutions dusting off the cobwebs from lecture recording platforms as soon as campuses reopened, snapping back to the ways of learning dominant in 2019 (Bryant, 2021; Evans, 2022; Robson et al., 2022).

The increasing effectiveness of broadcast technologies, the growth of lecture recording as both a study-aid and a 'value-add' for students (Secker et al., 2010) and the rise of scale as a business model in higher education has further entrenched the lecture as both an economic and logistical necessity (Johnes & Johnes, 2009) . The literature of the educational benefit of lectures is rent with hyperbole, tradition, or anecdotal assertions of student demand and its role in defining a proper and expected university experience (Burgan, 2006; Harrington et al., 2023; Wong & Chiu, 2019). Alternately, the disparagement of the lecture form in the literature aligns lectures with neoliberalism, inactive learning and didactic pedagogical engagement (Folley, 2010; Litvak, 2023).

The modern practice of lecturing has strayed away from its Greek celebration of the skills of oratory and its representation of performance and theatre (Mcleish, 1976). Lecturing pedagogy has become magnified, multiplied and rote, evoking student experience detractors such spillover rooms and the growth of lecture recording as a replacement for the face-to-face experience when space does not equal capacity of accessibility (Balloo et al., 2017). The larger the lecture gets, the harder it becomes to engage directly with students and more importantly, to support engagement between students (Michinov & Michinov, 2026). Lecture recording systems, purchased by universities originally to help students recall and encourage deeper learning, can easily replicate the experience of being at the lecture, especially if the quality of the lecture is repetitive and didactic (Branchu & Flaureau, 2022). Depending on your definition of scale, large lectures frequently need to be repeated multiple times in a week to ensure all students in the cohort have access to an 'in-person' experience. In some institutions, they have utilised overflow rooms, with the lecture broadcast synchronously to another large lecture theatre, with little opportunity for interaction from a generally disengaged student populace (Exeter et al., 2010).

The student experience in lectures in these contexts can become receptive, informed by broadcast pedagogies with student behaviour driven by browsing habits, speed watching and passivity (O'Callaghan et al., 2017). Interaction is one-way, between the teacher as the performer and the students acting as the audience. Intra-audience interaction is thereby shunted to messaging apps, social media or in those pre-

digital days, notes shared between students, all acting as an unedited, unfiltered but efficacious back channel which frequently offered positive support for learning (Hollinger & Piña, 2023; Kjærgaard & Hachmann, 2022). These models of interactivity are disconnected from each other, reliant on the informal networks that have formed within a class at scale, or potentially isolating those who have not yet formed their connections.

So, what is wrong with the lecture?

There is nothing wrong with the lecture as a mode of teaching if the designer/lecturer are aware of, and can design for, its limitations. Lectures work effectively and economically to transmit information at scale. They can be inspiring, aspirational and oratorial if the staff delivering them have the necessary skills set to transform them from being the sage on the stage to something altogether more performative (Tronchoni et al., 2022). Passive learning practices like reading off slides or repeating knowledge that can be acquired elsewhere without adding value enable the lecture to be replaced by the lecture recording software, which in turn contributes the on-going crisis of engagement being experienced in universities (Klein et al., 2023; Lowe et al., 2025).

One aspect that is rarely discussed in relation to lectures is scale as pedagogy. The economic benefits of scale are articulated extensively in the literature, especially aligned with the wider debates about the rise of neoliberalism and the marketised, modern university (Busch, 2023; Mintz, 2021). Scale can offer significant and unique pedagogical benefits, from the student being a member of a crowd and leveraging the processing power and collective intelligence that is catalysed by immersing yourself in the noise and chaos of a large group (Bryant, 2015) to the power of community to find collective purpose and meaning (Long & Lock, 2013).

The challenge of interactivity at scale

The debates about the primacy of the lecture form are ongoing (Crawford & Parsell, 2025).

- They have worked for centuries, people say (Brown & Luzmore, 2021)
- They have a place in the finely balanced ecosystem of higher education to provide content, offering an oratorial perspective on the complexities of disciplinary knowledge, they argue (Loughlin, 2025).
- Listening is a virtue that students need to acquire, as Webster (2015) argues citing both Vygotsky and Freire in the process to defend lectures.
- They are an archaic and arcane model of teaching not suited to the 21st century university and its flexible cohorts of students, say the disruptors, with Kalantzis & Cope (2020) arguing that '...sitting in classes and listening to lectures is an absurdly sub-optimal cognitive load for today's students who on their personal devices have become habituated to designing their own information feeds then skipping through their messages' (p. 52).

Muller (1890) writing in the New Review observed the controversy around lectures over a century ago, noting quite presciently that:

> ...the system of imparting instruction by means of lectures, has for some time been subjected to an uncompromising criticism... first of all, most lecturers are too long. A whole hour is long, even for a sermon.... secondly, our audiences are generally too large.

He argues that a good lecturer is defined by two attributes. Firstly, they do not teach facts, rather their object '…is to teach how to master the facts, how to arrange, how to digest'. Secondly, they are not afraid to engage in any discussion or answer any question on their topic or to say, 'I don't know'. According to Trigwell & Prosser (2004) a good lecturer adopts a student-focused approach that promotes conceptual change rather than information transmission, a practice strongly associated with high-quality learning outcomes. The challenge comes when lectures eschew these higher-order skills for transmission and repetition, leading to the euphemistic assertion that lecturing is the easiest form of teaching to do badly (Ramsden, 2003).

Despite the lecturing capabilities of the academic, within the spaces and structural characteristics of the lecture, the student has limited opportunities to exercise agency over their learning, other than through attendance. They cannot influence the structure, pace, absorption, level of challenge, intersections, and connections of the information they are asked to receive. Lecture theatres are by design built for reception by many and transmission by one. Even the simple task of a student asking a question is made complex by the scale of the space and the control of the amplification by the academic (even accounting for the performance anxiety of asking a question in front of 600 peers).

Engaging students interactively in large lectures presents persistent structural and pedagogical challenges. Large cohort sizes constrain opportunities for dialogue, timely feedback, and the adaptation of teaching to student misconceptions, often reinforcing passive learning norms (Bligh, 1972). Cognitive load and attentional decline further limit interaction, with evidence showing that sustained attention in lectures typically deteriorates after 10–15 minutes, particularly in large theatres (Bradbury, 2016) While active-learning strategies such as peer instruction can mitigate these effects, their implementation at scale is uneven and dependent on technological infrastructure and lecturer expertise. There is a significant disconnect between the possibilities of what can be done at scale in large-group teaching and what the spaces will enable or allow (Arvanitakis, 2014; Swinnerton, 2021).

The critical challenge for designers and academics when discussing the lecture as a form of economical, at-scale teaching is the challenge of creating and sustaining effective interactivity, both between students and the teacher and between students themselves. There is a large corpus of research that argues for the efficacy of sociality, connection, dialogical engagement and active learning in facilitating and catalysing deep learning (Vygotsky, 1978). This is extended through the literature on connected pedagogies and learning (Bilandzic & Foth, 2017; Fung, 2017) The design of socially constructed or connected interactivity at scale is an existential challenge for higher education teaching and learning, in part because of the way we operationalise interactivity in lieu of other established modes of teaching and learning deployed at scale. Putting aside the monodirectional nature of most lecture spaces, with their prosceniums of screens and whiteboards, their fourth walls and their escalating tiers to support an audience-like experience, interactivity is not native to lecture design (outside of online learning). There have been various solutions enacted to overcome the communicative and architectural limitations of lectures, including personal response systems (Gauci et al., 2009), the emergence of collaborative lecture theatre designs (Swinnerton, 2021) and probably the most popular intervention, flipped learning pedagogies (Kwan et al., 2025; Roach, 2014; Seery, 2015)

A case in interactivity – flipped learning

Flipped learning is one of the most discussed and implemented reconstructions of the lecture form of the last twenty years. The principle of flipped learning was simple: move the teacher-oriented didactic reception of knowledge out of the face-to-face space and replace it with learner-centred active opportunities for engagement, allowing for practical work and problem-based learning. As Love et al.,

(2014) note '...doing is more important than knowing and...learning is a trial-and-error process' (p.319). Over the last two decades flipped learning pedagogies have included the deployment of asynchronous media content (from purposefully designed chunks to reuse of previous years lecture recordings), and the use of established tools for interaction in the form of question and answer, problem sets and case studies. These techniques have been met with very mixed success, with student satisfaction improvement and learning gain challenged by perceptions of missing out on content, the value propositions of participation and the significantly increased design burden on the teacher, at least in the initial flipped class (Fisher et al., 2021; Wilson, 2023).

Where the flipped learning pedagogical model unravelled was how to make 'doing' happen at scale (Kadi et al., 2017; Kapur et al., 2022). As with other modalities of teaching at scale, technology became the promised solution to ameliorating the challenges arising from noise, the spread of engagement and perceived and actual participatory motivations of students, especially if there were transactional motivations at play (see this case study on Nottingham Trent University in the UK by Boulton(2014). Flipped learning approaches saw lecture theatres of students challenged to crack problems or undertake practice activities within technology mediated platforms like the Virtual Learning Environment or third-party applications such as polling or collective problem solving to move noise and interaction away from the physical space (O'Flaherty & Phillips, 2015).

Audience response systems and mobile polling can increase participation at scale, but often produce parallel, rather than collective, engagement, limiting spontaneous verbal interaction in large rooms. Consequently, flipped lectures may intensify technological connectivity without fully realising embodied, in-person interaction, particularly under constraints of scale and space (Kay & LeSage, 2009). This forced bidirectionality engenders a kind of call and response dynamic, where students were asked to respond through the knowledge created by the academic, reflecting it back verbatim or exposing their own questions and uncertainties as opposed to creating knowledge for themselves. The critical impasse is when there is a call, but no response. Flipped learning pedagogies effectively replicate small group teaching practices and magnifies them to work in larger spaces, which in part dilutes the human, emotive and transitional aspects of interactivity that work so effectively in tutorials.

Lectures as a social space

From an architectural perspective, social space is produced through relational practices that enable connection, negotiation, and collective meaning-making, whereas consumption space is structured to regulate behaviour through commodified scripts and controlled affect. Following Lefebvre's (1991) distinction between lived and abstract space, social space privileges appropriation and use-value, while consumption space prioritises exchange-value and programmed circulation. Zukin (1998) argues that architectural aesthetics mediate this shift, translating social interaction into market- oriented spatial experience.

There are significant epistemic differences between the learning that happens in and through social spaces and learning that occurs in consumption spaces. A lecture theatre and the lecture form are generally not social spaces as there are not always purposefully designed opportunities for sociality and collaboration in the lesson plan. This can be a function of architecture or a pedagogical matter of convenience. In these instances, a lecture is a consumption space. In urban studies, consumption spaces are city plans and retail spaces that are designed to enable consumption (in a consumerist sense) (Shields, 2003). Lecture theatres act within similar architectural boundaries, enabling a transactional mindset to higher education (Bryant, 2023). Sociality and socialisation do occur in these spaces but not necessarily between the teachers and the students, but from student to student in informal, unmediated

backchannels, facilitated through the same social media they use for their work, life and play (Kjærgaard & Hachmann, 2022).

Lefebvre (1991) argues that social spaces are complex and defy analysis, and that:

> '…from the point of view of knowing (connaissance), social space works (along with its concept) as a tool for the analysis of society. To accept this much is at once to eliminate the simplistic model of a one-to-one or 'punctual' correspondence between social actions and social locations, between spatial functions and spatial forms' (p.26).

In Lefebvre's conceptualisation, the triad of social space (conceived space, as articulated by designers, perceived space as it exists in practice or in the day-to-day mundanity of use, and lived space, as space is experienced by those within it) fractures the structural limitations of power-informed 'correspondence' between a student and the teacher and exposes the cohort to the possibility of analysis of complexity, rather than the sharing of the functions of it, however abstract that might be.

Traditional lecture theatres enable an essentially monotonal affair, in part because the lecturer controls access to all the devices that amplify sound and share vision. They are designed to work for the majority of users as a consumption space in the same way a restaurant or music venue is designed to facilitate consumption over production and sociality. The 'audience' sits in silence watching the show unfold in front of them. Noises reverberate as part of a purposeful acoustic design. When students begin to interact and engage with each other it gets loud, with voices echoing against each other in cacophony, often in rooms with impossibly high ceilings. The lecture theatre and it's conceived for purpose are a manifestation of the challenges of learning in chaos (social spaces) and learning through calm (consumption spaces). When people interact it can seem chaotic, lectures on the other hand, are calm in comparison, with only a single voice amplified and reinforced in a space designed specifically to enable the centrality of the performer and the performance.

Social spaces support the production of knowledge that transcends the singular interactions of an audience member interpreting and receiving the intentions of the lecturer. The creation of social spaces that trigger and facilitate interactivity at scale offer opportunities for knowledge production arising from the quantum and breadth of the interacting crowd, facilitated effectively in and through platforms and spaces. Interactivity at scale triggers deeper learning, more active engagement with lived and living experiences and more challenging, curious, and creative learners. The design of a social space to enable interactivity at scale is not independent of the architecture of the space, but can transcend the affordances and limitations of technology, seating, and structure. It is the interactivity itself that imprints onto the space. It challenges the expectations of behaviour (which itself can be difficult or traumatic or feel unsafe). As Lefebvre (1991) notes:

> The social relations of production have a social existence to the extent that they have a spatial existence; they project themselves into a space, becoming inscribed there, and in the process producing that space itself. Failing this, these relations would remain in the realm of "pure" abstraction–that is to say, in the realm of representations and hence of ideology: the realm of verbalism, verbiage and empty words. (p.27)

The design of interactivity at scale poses two epistemic and pedagogical challenges for developers. Interactivity must transcend the abstraction of some of the previous models of lecture mode transformation such as flipped learning, which in many cases effectively replaced the didactic mode of delivery with other passive forms of sociality. Secondly, it must engage with the different spaces it exists

within to deliver an effective and sustainable inclusive pedagogical experience that achieves learning outcomes, builds a true and lasting sense of connection and collaboration within a cohort, whilst not compromising the embedded institutional benefit of offering at-scale learning. The lived experiences and the remembered perceptions of chaos and calm remain powerful antecedents to any redesign of the lecture as an interactive experience at scale. Interactivity at scale as it has been theorised here can help the learner and the teacher transcend expectations and perception and deliver a truly transformative experience for the entire cohort. The key as always is purposeful pedagogical design.

Design challenges for large-scale interactivity

Designing interactivity at scale through the creation, nurturing and acceptance of social spaces is not an easy or risk-free task. There are challenges such as architecture, audience, dynamics, systems, inclusivity, and transition that by necessity shape the design of activities, communication approaches, feedback loops and connection making. Designing effectively for these challenges in the wider epistemic and pedagogical ambitions of the unit of study and the economic affordances of scale can seem like threading a needle in a hurricane. Interactivity at scale, whilst deeply impacted by purposeful pedagogical design, is enhanced by how it is experienced by those in the room. Interactivity is a lived experience, it is not a mandated one. Addressing these challenges exposes realistic possibilities for interactivity and its ensuing connections to be both experienced *as* learning and experienced *through* learning. I have posited six challenges that can catalyse or undermine effective interactivity at scale design thinking. These are: *the challenge of architecture, the challenge of audience, the challenge of quiet/loud, the challenge of systems, the challenge of inclusivity and the challenge of transition*. For each challenge I will propose broad, purposeful solutions within the realistic constraints of university ambition, budget and capabilities.

Figure 1. The challenges of designing for interactivity at scale

1. The challenge of architecture

Most lecture theatres are not designed for interactivity. They have a simple yet effective design that facilitates the opposite. They privilege didactic engagement through sound reinforcement, an audience/performer dynamic and the location of audio-visual control and reception. Students are expected to watch and learn, academics to profess and teach. The space is full of barriers; oversized and dominant teaching desks, steep tiers and seating in rows that prevent exit in the middle of the performance.

In that space, ask a group in row 5 to work with a group in row 12, and make sure you include the one student sitting all the way at the back. Next, you the teacher, try and find your way to that group to check on their progress, answer questions. Finally, let's ask those students to present their answers to the whole room. Rabe-Hemp et al., (2009) (in the context of comparing distance education to traditional campus-based learning) argue that this instructor-centred learning leads to passive learners, decreased motivations to attend classes and an unhealthy focus on grades over attainment. We see it in empty lecture theatres, high lecture recording use and disengagement even with attempts to encourage participation (see tweet from a Professor at the University of Sydney in 2022). The design of lecture theatres is also challenging for neurodiverse students, with one study from the UK identifying several significant learning impacts of space design for autistic students (Tavassoli et al., 2024). Adjustments for physical disabilities, whilst usually included in space design briefs (hearing loops, accessible spaces for wheelchair users, for example), are not always effective in enabling a more positive learning experience (Braimah & Mensah, 2018).

Figure 2: An empty lecture theatre at the University of Sydney

The solution is to re-design or break the space. Re-designing the space can be an expensive exercise, although less expensive than rebuilding lecture theatres all together. Breaking space represents a different, arguably more responsible value proposition. Redesigning tiered lecture theatres is expensive because of the architectural constraints of a tiered space, usually enabled by concrete, making redesign challenging. Lecture theatres span multiple floors, have significant emergency infrastructure to facilitate egress and high-cost audio-visual installations. Over the years I have proposed various interventions to enable interactivity in tiered spaces, including immersive experience (enabled by even more technology) and more flexible shorter timetabled experience sin lectures backed more a deeper intensive active learning experience in tutorials. I have also piloted removing the in-person lecture all-together and replacing it with chunked, non-linear multi-perspective storytelling.

The most common interactive intervention remains the collaborative lecture, where rows are replaced by small group tables and/or lounge seats which enables focused group work. Many of these have on-demand microphones allowing for students-student and student-teacher engagement and feedback. The design of collaborative lecture theatres has shifted from transmission-oriented auditoria to spatially active environments that deliberately structure interaction. Consequently, contemporary collaborative theatres prioritise flat floors, round or polygonal tables, pervasive writable surfaces, and decentralised displays, features exemplified by SCALE-UP classrooms (Burke, 2015). Collaborative lecture theatres enable the active immersion and engagement in theory, supporting stepped progression through aligned conceptual design, with students being able to help peers achieve and understand threshold concepts (Bryant, 2023; Shepherd, 2021)

The other option is to break the space. By that I mean, use lecture theatres for purposes they were not designed: make activities interactive despite the limitations of space and turn the affordances of an effective lecture space (audience, sound reinforcement, a 'stage' vibe) into ways of triggering interaction. This is a pedagogical design intervention rather than an architectural one. You could turn the front of the lecture theatre into the stage for a case study, a speaker's corner, an open mic night or a panel or debate. Engage the students to break down the expected behaviours in the space and gamify their engagement. Make the noise and chaos part of the learning process, whilst supporting those with neurodiversity to learn effectively in the dynamics created. Or supercharge the spatial structures by using the theatre capabilities to heighten the performance elements of a lecture, make it a real event and experience (as opposed to reading off slides).

All these interventions imbue the space with the lived and living experiences of those who reside in it. Atmosphere and architecture define one experience, the people in the space make those experiences their own. A case study on how this was achieved at the University of Sydney Business School in the Leading in a Post-Crisis World program was produced by Peterson et al., (2022).

2. The challenge of audience

There are dynamics, expectations and fears that define the challenge of being part of an audience. The tropes and expected behaviours of students in lectures align closely to that of an audience for a performance. They are passive receivers who learn through listening, reflecting, and repeating the lecture as a form of revision. Academics expect students to receive lectures as a shared, broadcast-style performance, sustaining attention, regulating pace, and engaging cognitively rather than passively consuming content. Students are assumed to track argument flow, manage cognitive load, and co-produce meaning through active reception aligned with intended learning outcomes (Boedeker et al., 2025; Chi & Wylie, 2014; Dipiro, 2009) As McKeachie (1997) notes, students like the passive approach because it means they are taught, rather than actively learning, they have the disciplinary knowledge

organised for them and that lectures align more closely with the expectations of the final exam. The design of interactivity at scale must overcome the inherent passivity that is expected of students as mediated by the space and curricular design. A lecture theatre is an easy place to hide, a difficult place to traverse and the audience is often motionless and static.

The solution is to change the dynamic. Make interaction part of the essential nature of being in that class, without enforcing a singular mode of engagement. It is still a daunting space, with all the fears and inhibitions of public speaking and performance. It is also not the most accessible of spaces for physical and neuro diverse learners. But working in small groups and then shifting to facilitating those groups to share their insights or solutions, not necessarily with the whole room, but with others in the space changes the dynamics of the room and breaks the fourth wall. It engenders the experience with action, connection, and a sense of fun (fear, creativity, etc). The risk for designers and teachers is that passivity is easy for all involved and working in groups is not always welcomed, which can lead to decreasing attendance and engagement (see this fascinating political intervention as described by Lodge (2026)). The key is to make sure engaging in production and sociality has meaningful value to the students and that the value of consumption is neutral at best.

3. The challenge of quiet/loud

There is a trope in music, especially prevalent in the indie/alternative genre, called the quiet/loud dynamic. One of the leading exponents of this style are the Pixies, who start a song softly and then as they come to chorus, whack on the distortion and the song roars into life, only to retreat into the sparsity of the quiet chorus. The most popular version of the quiet/loud dynamic is Smells Like Teen Spirit by Nirvana (a band heavily influenced by the Pixies). Quiet/loud rides the dynamics of sonic expectation and release and then come down, all within the constraints of five-minute pop song. Whole genres have formed around this dynamic including post-rock which extends the quiet/loud dynamic to soundscapes and aural highs (Berman, 2022; Osborn, 2013). The quiet/loud dynamic has diffused beyond indie into emo, post-hardcore, alternative metal, the shoegaze revival, and indie folk, where contrast functions as a structuring principle. These genres mobilised dynamic rupture to articulate affect, tension, and release, privileging expressive discontinuity over homogeneous intensity.

A lecture theatre is designed for the verse; it is a quiet space (the calm). Interactivity will be the chorus, it will get loud at times, but the important thing is that loud in this context is good. Interactivity crunches down on the distortion pedal and let's fly (the chaos). In loud spaces, dynamics between people can change. In loud social spaces, interpersonal dynamics can become more affiliative and energetic. Elevated sound levels increase physiological arousal and excitement, linked to enhanced sociability, reduced self-consciousness, and stronger feelings of shared identity, facilitating spontaneous interaction and bonding (Welch & Fremaux, 2017). Noise also shifts communication toward closer physical proximity, increased eye contact, gesture, and synchronised movement, fostering non-verbal coordination and rapport (Miles et al., 2023). There are also considerations in both quiet and loud spaces for the impacts on students with neurodiversity, which can be exacerbated by cacophony and the crowd. Interactivity at scale can also be quiet, contemplative, studious and reflective. Asking a lecture theatre full of students to simply be quiet for a even a few seconds can have significant effects on the physiological and mental dynamics of the class, focusing attention and calming stress. Orators and public speakers have used this approach to great effect to build a sense of collective responsibility and community.

The solution here is to design for calm and chaos. Create activities that benefit from the power of the crowd. Use technology to displace the interaction to different online spaces and concentrate the effort of the design into the opportunities to connect and collaborate. Utilise interactivity *with* something, a video

or other media, a case study, a problem set. In the case of the Leading in a Post-Crisis World events described earlier in this essay (Peterson et al., 2022), the academics had students interacting with actors, with AI generated moderators or with a panel of experts and peers. Interactivity is not all group work and presenting those outputs back. Interactivity at scale forces you to think out of the box and rethink the spaces and their expected and perceived behaviours. The other important aspect of addressing this challenge is being willing to disrupt the mode of the space. A lecture theatre and a timetabled lecture denote expected behaviours, sequences, blocks of time and dynamics. Imagine starting your lecture with 10 minutes of content, breaking it down into smaller groups and then being able to bring it all back together as a large group, without students having to move or change rooms, affording breakout spaces where activity can happen but also communications be initiated and shared from teacher and the students. This is disrupting the mode. Bringing the dynamics of tutorials, workshops, lectures, self-study, group work and teaching and smashing them together to form something new, unique and pedagogically exciting for the students and the academic.

4. The challenge of systems

University systems such as timetabling, audio-visual technologies and curriculum management rust on lecture/tutorial models and make the flexibility of interactivity difficult to facilitate. Systems reinforce a learner experience that fits within their UX parameters and functionality. You want to have a single large group in week 1 and then four groups of 50 in week 2 and then a small group seminar for 200 people in week 3, systems will invariably say no. The capabilities and costs of the systems challenge interactions supported by technology greater than the single voice at the front. University systems are often inflexible due to bureaucratic governance structures, shared authority models, and institutional inertia often brought about by the costs of replacing rather than maintaining those systems. Decision-making is diffused across councils, senates, regulators, and professional bodies, slowing responsiveness and privileging stability over adaptation. Many universities combine managerial strategies with entrenched bureaucratic policies (such as procurement and timetabling), reinforcing formalisation and risk aversion (Woelert & Stensaker, 2025).

The solution is to break the system. We can only break the system if we can collectively make both the economic and pedagogical case for the necessity to do so. Revenue models and costs are tightly wound systems with little margin for error. Breaking the system does not have to be rent with risk. Small interventions such as webcams, open software solutions and using existing tools like the Learning Management System in different ways can break the system to achieve the aims of interactivity. Breaking the system also requires students to come along with you for the ride. And again, this means that there needs to be an effective and persuasive value proposition. There also needs to be evidence for the success of the revolution, measured in terms that are meaningful to the strategic aims of the institutions. Student satisfaction metrics, retention and recruitment are critical success goals that are defined and enhanced through better teaching and learning.

5. The challenge of accessibility

There are both deliberate and accidental considerations of accessibility and inclusion in traditional lecture theatres. Most lecture spaces have clear design briefs and technology to ensure sight and hearing. Lecture theatres are designed to support access for students with disabilities. On the accidental side of the coin, lecture recordings can help with closed captioning, neuro-diverse learners and students who cannot attend in person for health reasons. I say accidental because these are not the purposes for which they are designed, and they come at the expense of being ‘in the room’. With the significant increases in self-reporting of mental health issues in higher education students (Lewis & Stiebahl, 2025), the challenge of accessibility is more than an architectural one, it significantly impacts on the authentic

achievement of the Sustainable Development Goals and the inclusive soul of the socially responsible university. Accessibility is not someone else's problem.

The solution here is to expand your idea and understanding of accessibility. There are multiple theories of accessible and inclusive learning. Accessibility and inclusion in interactivity are more than the physical structures of the room. To be effective, design needs to engage with the wider principles of access and equity, wellbeing, and safety. Put on your designer hat and think through how each activity you offer to students, each decision you make, each opportunity for connection can be made more accessible. Widen and deepen the opportunities, platforms and models of collaboration and connection. Designing accessible, inclusive interactive learning at scale draws on Universal Design for Learning and inclusive pedagogy, emphasising flexible representation, engagement, and assessment. Research shows that embedding accessibility from the outset improves participation, learner agency, and equity across diverse populations, particularly in large, technology-mediated learning environments (Anastasiou et al., 2025). Engaging with the experts in your institution on accessibility and inclusion and listening to your students are critical first steps.

6. The challenge of transitional space

The final challenge is more existential in the context of space. Transitional spaces are '…entertaining strangeness and playing in difference. We are crossing that important internal boundary that is the line between the person we have been but no longer are and the person we will become (Ellsworth, 2005). Transitional spaces are a different representation of the journey than the common parlance of liminality affords, which inculcates uncertainty into the transition between social states. Transitional space allows students to work through the experiences they have already had in work, life, play and learning to reconstruct and define reality and their identity as leaders as and when it happens (Dubouloy, 2004).

Transitional spaces facilitate learners to draw on the knowledge, skills, and experiences they bring to university, however nascent, to make connections and enable a transitional experiential learning benefit. These situated lived experiences are critical to developing the transdisciplinary skills of resilience, creativity, and intuition that are essential for the future success of business students. Transitional spaces represent safe ways to experience crisis, challenge, fear, opportunity, possibility, and creativity. They run counter to many of the policy settings that undermine of the marketisation and 'first job-ness' of modern higher education, which link education and certified performance to success in attaining graduate employment in a 'dream job'. They are authentic representation of the presence of the students in the spaces of learning. They are not a product or outcome.

For the design of interactivity at scale, one solution is immersion. Immersive experiences trigger multisensory learning through tricking the brain into a sense of hyperreality. Baudrillard (1994) locates hyperreality in a simulacrum of simulation and imitation that finds fulfilment, happiness, or joy (and I would add learning) in simulated rather than a real reality. A hyperreal experience is one way to locate learning in transitional spaces as the safety, the journey and the understanding of self can happen in simulated experiences, very different to the passivity of the lecture. Immersion in large-group teaching enhances pedagogical and epistemic efficacy by situating learners within coherent, meaningful activity systems that promote active sense-making rather than passive reception. Immersive approaches (e.g. problem-based, simulation-supported lectures) increase engagement, deepen conceptual understanding, and improve learning outcomes at scale by supporting contextualised knowledge construction and sustained attention. They are scaffolded by the experiences of transition, drawing on the banks of experiential learning to locate and process the complex immersive stimuli (Devassy et al., 2023).

An afterword

The 2022 Bangkok Art Biennale deployed the title CHAOS: CALM as thematic frame for their exhibition, making connections between the world before, during and (heading towards) after the pandemic. The program describes the very human learning that comes from engaging with both chaos and calm:

> The binary opposite of chaos and calm will reflect the zeitgeist of the confusing world we live in. Artists whose works reflect turbulence, trauma and angst remind us of the fragility of life at the time of pandemic, climate change, environment detriment, politics, and clashes in ideologies. In the dystopian and delusional world, the artists reveal consequences of destruction of humankind and nature from their own making.
>
> Amidst chaos, there are glimpses of hope and serendipity as human and nature slowly come to terms with survivalism. With the immensity of detriment and destruction, ways of life will never return to what once known as normalcy. Discovery of calmness in turmoil can be unexpectedly enriching through sagacity and chance. Such process covers a wide range of demands including empathy, patience, allure, and humour. Calmness and tranquillity can still be experienced simultaneously in our new world of post-pandemic and upheaval. (Bangkok Art Biennale, 2022)

Interactivity at scale is not an easy design challenge or experience for the learner, the teacher, or the institution. It is one of the reasons why flipped learning persisted as an alternative to lectures. True interactivity is much more complex, dangerous, and risky, but equally if designed well, the opportunities for inspirational, transitional, and transformational learning far outweigh the momentums against change.

2026 Afterword – CONNECTSpace

In 2024 the University of Sydney Business School, along with the Faculty of Engineering started teaching in a purposefully designed large-group space designed for interactivity at scale. CONNECTspace is a large flat-floor teaching space in the Peter Nicol Russell Building (PNR) of the University of Sydney. This state-of-the-art room allows for the engagement with 160 students (and up to 200) enabling the pedagogical possibilities that arise from connection, adaptability, flexibility, and engagement.

CONNECTspace exemplifies how spatial design, pedagogy and technology can be intentionally aligned to enable connected learning at scale in social spaces. Unlike traditional lecture theatres, CONNECTspace was designed to actively mediate connection between students, educators, ideas and disciplinary knowledge, positioning connection as a core epistemic driver of learning rather than a by-product of classroom interaction. The uniqueness of the space lies in a design framework centred on five learning capacities: engaging with the crowd, group and individual; generating ideas; sharing work; building social connections; and creating safe conditions for student success. These capacities are embedded into the physical layout, digital affordances and facilitation practices of the space, enabling participation and collaboration even in large-cohort teaching contexts (Bryant, 2024; Bryant & Alderton, 2026).

CONNECTspace is innovative in its capacity to integrate hybrid and active learning approaches, supporting rapid reconfiguration for problem-based learning, design sprints, industry-led workshops and authentic assessment, strengthening student engagement, agency and sense of belonging, while also enabling staff to experiment with practice-informed pedagogies at scale. For both the students and the staff, agency is imbued into the DNA of the space. It was designed to move organically with the momentums of the dynamics in the space, affording students the responsibility to choose their learning environments, their own site lines and levels of comfort to engage, and they own determinants of quiet/loud.

CONNECTspace utilises innovative thinking in how students and staff inhabit space for the purposes of learning and teaching. The flexibility comes from the capability to deliver different modes of delivery at different class sizes and with different types of active learning in the one space and within the same timetabled slot. An academic with purposeful curricular design can swing quickly from the delivery of a lecture and with a press of a button, switch to small group teaching across four spaces and then back again to reflect on the activity and share the work students have been engaging with. It is a complex, multi-directional conversation. The adaptability comes from the purposeful selection of furniture and technology that easily enable multiple modes of engagement and connection for both staff and students. It embeds connection into the fabric and culture of the space, supporting accessibility and inclusivity and making a space that is welcoming, comfortable and agential for those who reside within it

Learning design principles that enable the CONNECTspace

PURPOSEFUL – Teaching, learning and assessment activities are designed specifically for mixed modes of participation within the same space and within a specified timetabled slot. Purposeful design includes considerations such as group facilitation, authentic engagement and communication across the cohort, clear guidance and instructions for active learning activities, equity and adjustment for students and staff, alignment with learning outcomes and reasonable student agency in relation to participation. Purposeful design breaks down and rethinks all teaching and learning from the delivery of engaging information, through to the deployment of active and connected delivery activities and the submission and grading of authentic assessment and feedback. It asks the question, how can all the students in the cohort learn through these activities, develop, and apply the critical soft and hard skills arising from this unit and build and leverage connections with others, the discipline and the institution?

WIRED – Using technology effectively to design for equal opportunities and capabilities for all students to participate. The capability to use the technology in the space and the technology brought into the space by the academics and the students to enable active learning within and between students working in groups. Where the cohort includes hybrid students, the technology is balanced towards the connection of the online students to the physical students in the space they are occupying. It recognises that proximity can be facilitated through the judicious and considered use of learning and audio-visual technology.

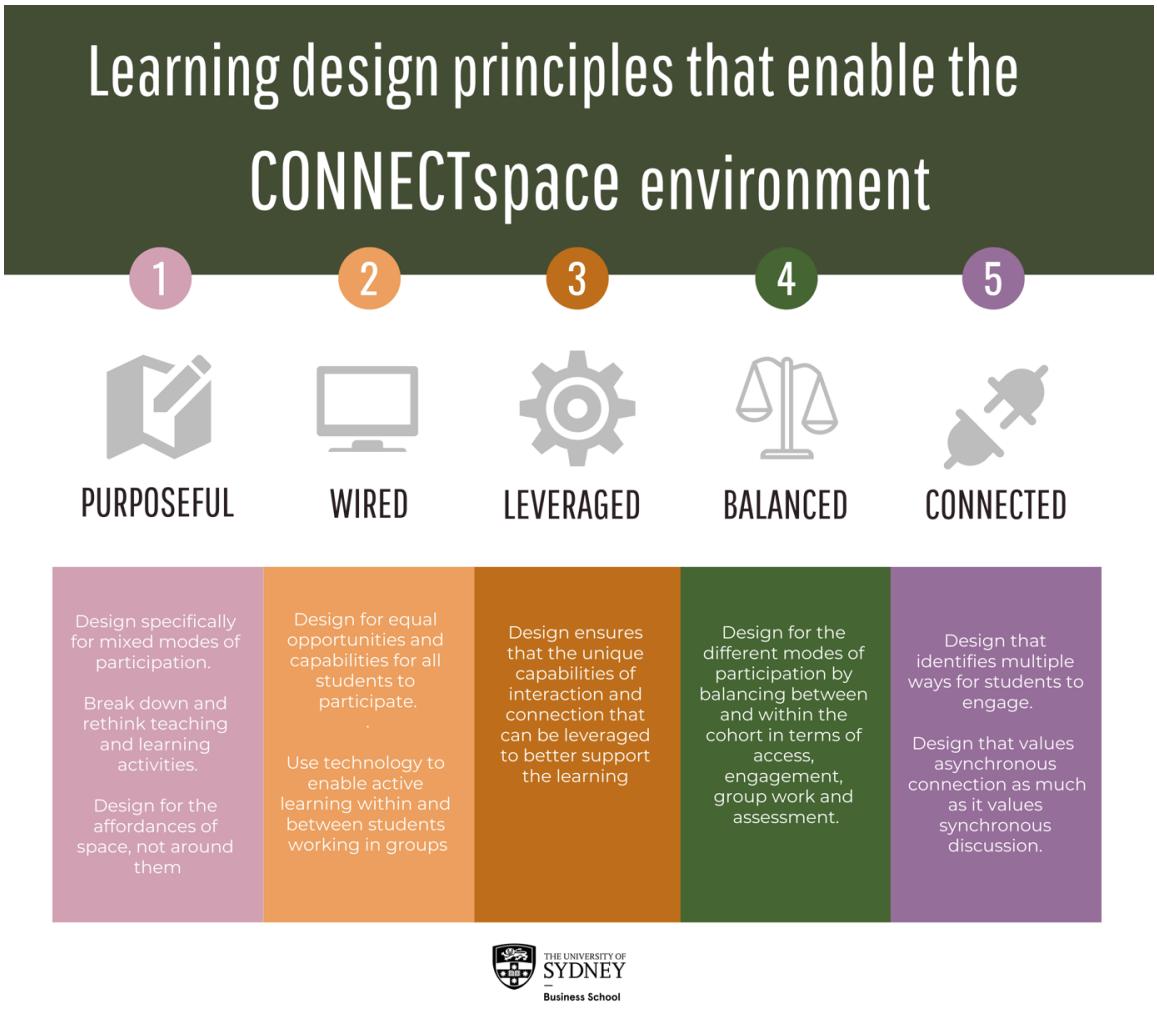

Figure 3: CONNECTspace design principles

LEVERAGED - Allowing for and using the affordances of space where appropriate (or necessary) and ensuring the negation of these affordances where it is not necessary or appropriate. Leveraged design ensures that the unique capabilities of physical interaction and movement can be leveraged to better support learning. Learning design avoids finding and delivering to the lowest common denominators between the modes of participation.

BALANCED - Finding a balance of engagement between students in different modes of participation, both in terms of self-selection of groups and in terms of structured or more openly designed activities. A balanced design finds the appropriate mix of engagement, content, and challenge within a class. This mix is not bound by a timetable that locks each mode to a specific weekly timeslot rather it adapts to the learning needs of the weeks learning outcomes and the needs of the student cohort.

CONNECTED – Connected design allows students to make and use connections between each other, with the teacher and with the critical learning points within the class. Connected design identifies multiple ways for students to engage and considers the limitations within modes of participation as well as between modes. Connected design can value asynchronous connection (such as using crowdsourcing, debate or conversation deployed over the duration of the unit) as much as it can value synchronous discussion such as conversation, discussion, or question/answer.

CONNECTSpace deployed socio-material features to enable new forms of sociality, participation and pedagogical engagement. The project's strategic objectives were to design teaching spaces that supported world-class education; create inspiring and adaptable environments; renew existing rooms to accommodate diverse teaching methods; provide professional, engaging spaces for student interaction; and establish an aspirational model for future university learning environments. The final space as it was realised demonstrated that shifting the dynamics of space, from mono-directional to multi-directional, enables fluid movement between crowd, group and individual learning. Second, it evidenced that redesigned functions, including flexible furniture, integrated hybrid technologies and writable surfaces, supported idea generation, collaboration and knowledge sharing at scale. Third, it identified how aesthetic, cultural and architectural choices reshape relationships between users and the space, cultivating belonging, safety and connection.

It was the realisation of a long journey of experimentation and ideation about the use of space of interactivity at scale. This work started at the University of Greenwich in the UK in 2013 with two spaces that enabled student connection through technology. It was further developed in my work at the London School of Economics where along with colleagues we redesigned teaching and learning spaces to build small group capability (Wilson et al., 2017) and, along with architectural partners, the teaching and learning expert group developed new approaches to large group teaching privileging student-to-student eye contact in a lecture space and supported quiet/loud dynamics in student learning spaces (also at scale) (Moore, 2019).

It is true to say that change is not easy, nor is it quick to deploy, and even longer to see the impact. With the absolute focus of institutional strategy on AI, we run the risk of letting these critical debates slip as indulgent. These are essentially human debates that require institutions to stand by their own stated aspirations of human-centredness and transformative experiences. Space and how we inhabit it changes the moment we start talking about AI. AI tutors do not have offices, AI markers do not require desks, lights, heating or technology. Code has no corporeal form. We are seeing the brown shoots of disengagement through attendance, attention and recruitment. The narrative is in: Jobs are going. Graduate employability is falling. AI replaces the knowledge economy with a product that creates knowledge better than humans. But university is more than that. It is more than a value proposition (although I am not Pollyanna and get the marketised university). It is more than AI literacy. It is an experience of habitation and living. University spaces are only alive when they have students and staff inhabiting them. AI spaces can never have that, and the consequences of offloading learning engagement to AI are, in my opinion, existential, especially when they replace parts of the holistic campus.

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