

In the Village: Enabling transformative and student led engagement with social science making through the design of technology rich learning spaces

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Learning through making has emerged as a critical form of pedagogy in the digital era of higher education, supporting active learning, students as co-creators and co-designers of their own learning and accessible forms of experiential education. Much of the existing literature and practice in making focuses on how to embed maker pedagogy within STEM fields and arts and media practice. This paper will explore the unique nature of making in social science education and role of technology rich spaces that were designed and deployed at the London School of Economics and Political Science in the United Kingdom played in supporting students to engage in social science making connected to assessment, teaching and as ways of navigating their own pathways through and inside their own village of learning spaces.

Keywords: Learning spaces, making, social science education

Introduction

Making has emerged as a form of critical pedagogy that supports active and participatory learning in higher education environments through the construction and sharing of something produced or created, often located in technology rich spaces (Blikstein, 2018; Bullock & Sator, 2015; Cohen, Huprich, Jones, & Smith, 2017). Many universities are investing in makerspaces and digital labs, supported by technology-led pedagogical innovations that can be used to connect students within and between disciplines, facilitating making and inspiring creative approaches to thinking by using digital technologies (such as 3D printers and drones) and more traditional maker forms and tools (such as Lego, DIY art or crafting) (Barrett et al., 2015; Moorefield-Lang, 2014; Thomas, 2018). The commonalities between the development and design of makerspaces and making as a form of teaching, learning and assessment are well explored in the literature on STEM education, both at University level and within secondary and primary schools (Barniskis, 2014; Barton, Tan, & Greenberg, 2016; Kalil, 2013). In the social science education literature, making as a form of pedagogy is a nascent concept often aligned with the pedagogical notions of student co-construction and students as producers (SAP) as opposed to the more constructivist, physical or experiential approaches inherent in STEM education (Gerodetti & Nixon, 2014; Neary, 2014). Whilst much of the technology located within makerspaces in academic libraries (such as workstations, audio and vide editing and gaming) can be used for social science making, the pedagogical focus has been on the role of that technology to better engage in tinkering and experimentation, transitions from consumer to producer and the development of technical skills in using devices such as 3D printers (Burke, 2015). How do spaces for learning and teaching in social science education support making pedagogies over and above the support of technological interventions and facilitation? Can the opportunities afforded by making pedagogies (and the spaces they are located and immersed in) go beyond the use of media and technology to facilitate creativity and tinkering to engage with an expanded understanding of making, one that is located within social science curricula and learning outcomes?

Located within the context of scaling and sustaining an award-winning portfolio of SAP projects at the London School of Economics and Political Science in the United Kingdom, this paper exposes some of the complexities of using spaces, technology and social media to support and enhance student and staff capabilities to engage in the definition and deployment of social science making pedagogies. It will use case studies of two spaces that (in part) work towards defining the requirements and conditions supporting social science making as a pedagogical practice as well as explore how singular spaces such as makerspaces present challenged notions of permission, belonging and facilitation in the context of some of the abstract notions underpinning social science making pedagogies and how collective, integrated spaces (the village) might better engage students with the organic, exploratory and contested activities of making.

Locating making as a practice

Making is a relatively generic term that has multiple meanings across several disciplines and fields of study (including arts and media, science, education and sociology). Lande (2013) argues that making is a connected

series of acts ranging from building to the process of turning parts into an object, aligning making (as a process) with the sense of creativity and fun it engenders for the maker. Britton (2012) adds to this by arguing that institutions can support learning by ‘...creating playful information-based spaces [that] allow the learner to explore and engage with content on the learner's terms instead of on the instructor's terms.’ Several writers have extended the conceptual definition of making to include cognitive processes such as thinking, analysing and creativity (e.g. Bratich & Brush, 2011; Gauntlett, 2013; Orton-Johnson, 2014; Ratto & Boler, 2014), whilst others have located making within more traditional activities such as construction, production, prototyping and tinkering (Bevan, 2017; Lock, da Rosa dos Santos, Hollohan, & Becker, 2018). Making has also been described as an attitudinal state linking practices and skills to wider notions of citizenship, participation and engagement (Ratto & Boler, 2014). Orton-Johnson (2014) makes the case that making is essentially a socially networked and connected practice that informs the wider engagement of the community through participating as a citizen. Making something extends the role of the maker past that of a consumer, affording them the opportunity to engage ‘passionately’ with the field or form (Dougherty, 2012).

The social capacity afforded by making has been significantly enhanced by technology and social media. The application of these technologies to facilitate and support the formation of DIY communities has blurred the lines between DIY making and social media practices such as the sharing and making of user-generated content (Lingel & Naaman, 2012). Henry Jenkins in his extensive writing on modern making culture argues that made culture is not a singular act, ending with the production of an artefact or shareable product. Across a number of studies on participatory culture (Jenkins & Ito, 2015; Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009) he argues that DIY making is an inherently social process that includes social practices such as the sharing of culture, lived experiences, play and bricolage. Even in the context of the physical acts of making, he argues that sociality in the form of networked and connected engagement, for example the remixing and repurposing of existing cultural forms, defines making in the digital age:

...the power of participation comes not from destroying commercial culture but from writing over it, modding it, amending it, expanding it, adding greater diversity of perspective, and then recirculating it, feeding it back into the mainstream media. (Jenkins, 2006, p. 257)

By including making practices such as re-mixing, modifying, amending and re-purposing into DIY making, Jenkins incorporates social processes that draw directly on the creative work of others (not just the replication of those works) to make something new. (Jenkins, 2006, 2009; Jenkins, Ford, & Green, 2013). This extension of making to include challenging, reinterpreting, re-using physically (objects and media) and conceptually (perspective and ideation)

Students as producers at the London School of Economics

The London School of Economics and Political Science (LSE) is one of the world's leading social science institutions with undergraduate and postgraduate programs specialising in disciplines across the spectrum of social science education from management and accounting, through government and politics and anthropology and sociology (with mathematics, statistics and philosophy in between). Before 2015, much of the teaching and learning at the School was delivered in traditional lecture/tutorial format and assessed through high stakes final examinations. As part of the Schools strategy for enhancing the student teaching and learning experience, a program of pedagogical interventions that engaged students actively in learning and provided opportunities for them to work together was launched in 2015/16. The aim of this program was to encourage students to build connections with colleagues and to enhance their capacities to both challenge and repurpose the knowledge they were learning. A critical component of this was program was the Students as Producers (SAP) initiative which was designed to transform the student experience from one that was primarily didactic to one that prepared the learner for the challenges of work and practice and engaged them actively in their own learning. Students were supported through learning and engaged through assessment to acquire and apply skills in communication, collaboration, problem solving and digital literacy to specific discipline-based contexts. These skills enhanced their capability to learn and inhabit the identity of emerging professionals and practitioners located within their discipline, through face-to face teaching and assessment supported by an authentic experience rooted in social science making practices. SAP was a multi-faceted project that had four main streams of activity, each designed to deliver the objective of enhancing learning, teaching and assessment through student co-creation in different ways;

1. **Pedagogical innovations in making.** Using a series of grants, the School supported twenty projects between 2014-2018 that included transforming assessment using methodological approaches such as documentary film making and media production, telling urban stories in Geography, podcasts for

students, the development of an undergraduate student led research journal and supported PHD students to make games for and with their undergraduate colleagues.

2. **Digital Storytelling.** This stream of activity generated student produced media across variety of platforms, both inside and outside the classroom, including projects to support the digital literacy of new students, and help students develop better digital and professional identities through posters, undergraduate research, blog posts, YouTube videos and participatory events. This stream supported the LSE2020 project where the stories and learning experiences of nearly 300 students were collected and shared via video (made by and for alumni and students).
3. **Creative hub.** The School built a hub of students and young professionals to work with programme teams and students to enhance their Moodle presence, to build skills around media making and design, and to work to enhance the quality of our learning spaces through interactive artworks, linked to technology and learning.
4. **Students as researchers.** The School developed a number of research projects that used students or recent graduates as research leads in projects ranging from learning analytics, student voice and satisfaction projects, program evaluation and learning spaces research. These projects were shared publicly and presented by these students at the School and at conferences

This paper will focus primarily on the first two streams of activity (although some of the data used emerged from activities undertaken in the other two streams). In the context of scaling the original small cohort pilots into larger units of study that impacted more students, we began to think about the importance of spaces to support at a practical level how we scaled these projects. For example, one pilot project supported 20 students to make documentary films. We were able to hack office space to become makeshift editing, collaboration and sound studios using a combination of furniture, some professional equipment and domestic technological infrastructure. When the project doubled in size, these spaces were insufficient, and their pedagogical limitations were exposed. The spaces also only addressed the direct media-making requirements of the project, and forced students to find other spaces to do the rest of the making and learning required to complete the assessments (planning, rehearsing, interviewing, collaboration and problem-solving). Most of the learning spaces at the School were designed as study rooms, generally individual with a limited amount of collaborative 'group study' space. They were not technology rich but were densely utilised, especially at assessment crunch points. One of the design intentions of a School-wide evaluation and redesign of learning and teaching spaces was to support and enhance the capacity for our students to engage in social science making collaboratively and to identify ways through which our students could share their making with others.

Defining social science making and the critical role of space

From a practical level, the School was faced with a shortage of spaces to make and show media, to record film and sound in controlled environments and to work collectively on making projects, both from the teaching side and the student engagement perspective. There were only limited spaces in the library primarily for students to engage with each other to debate and discuss social science challenges or pernicious questions. Students were not actively encouraged to work in groups or form communities in many of their units of study and the physical learning spaces reflected this dominant pedagogy, dominated by single seat desks, bean bags and quiet study environments which made finding collaborative and creative physical spaces difficult. This moved much of the interaction required for these units into virtual spaces such as Google Docs, WhatsApp and Facebook, all of which were in the direct control of the students themselves (Liote & Axe, 2016). It also left the University owned virtual spaces such as Moodle and library systems to serve as facilitators of academic compliance (assessment submission, referencing etc).

Pedagogically, the challenge of supporting and encouraging making in our spaces was a more abstract one. We first had to address the question; how was making represented in the teaching of social sciences, which is often theoretical, conceptual or socially constructivist? Making as a pedagogy can be demonstrable and visible within physical activities such as constructing prototypes, art, craft, artefacts etc (Hynes & Hynes, 2018) or in the form of coding for gaming, robotics or machine learning (Hsu, Baldwin, & Ching, 2017). These types of making whilst capable of being applied to learning social science disciplines do not reside naturally within their epistemological frames. As we engaged in evaluations of the pedagogical impacts of the SAP projects, different forms of making began to emerge. Located within the more intellectual aspects of social science education, our students learnt through making at a conceptual and ontological level. At a practical level, they were engaged in making documentary films as part of their assessment in visual international politics, which were shared with the

community of and cultures they were chronicling through various media sharing social media. Through our evaluation of the SAP projects we began to observe different forms of making that were manifest in processes such as debate between competing positions on critical problems, theory development and challenge, digital storytelling and student-led ethnography and collaborative problem solving. Supporting how students engaged in these forms of making outside the classroom and in the time and spaces they used for self-study, groupwork and assessment presented challenges, such as the increasing inappropriateness of the dominance of single seat study spaces and quiet areas. The challenge for the School was to design learning spaces that facilitated, both physically and technologically, these emergent forms of social science making so that students felt they were provided with the support and encouragement to engage and participate collaboratively.

Experiment 1 - The Rotunda Learning Spaces



Picture 1: Rotunda Learning Spaces – Clement House LSE, London, UK

Occupying a previously underutilised void space in a stairwell in the busiest teaching building of the School (Clement House), the Rotunda Learning Spaces (RLS) project is comprised of six learning spaces, designed for between 4-8 students each. The RLS had to be discipline agnostic, supporting the learning practices of students studying in multiple disciplines, all of which densely used this building. The spaces were commissioned on a very small budget with no architectural design input. From the earliest stage of ideation, the RLS were envisaged to be pilot spaces for different modes of learning not supported at the School. Picture 1 shows two examples of the six new spaces. The first (left) included small group work and theory development which was supported by moving laptop desks, interactive whiteboards and moveable seats. Another example (right) was the multimedia making space, with fixed computers designed for both casual use but also in the medium term, for use as editing computers for video. These two spaces were supported by four other pods of collaborative furniture, writable surfaces and power, located within bright, lush, open and well-lit spaces all thematically aligned to global cities. On two lower floors, large TV screens were installed in high traffic areas outside classrooms to share student made media, documentaries and animations with students waiting between classes.

It was not an explicit design outcome to support the kinds of social science making that we had begun to observe in our SAP projects (although the TV screens were added to support dissemination of these projects more widely). In order to better understand and whether the spaces were delivering on the design intention, we conducted a post-occupancy evaluation of the spaces, comprising of 174 combined responses collected through surveys and structured short interviews with students using the spaces and 67 observations of the learning spaces. The RLS were very popular with students (over 80% of students said they used the spaces regularly) and were recognised

as unique spaces for study that were a positive and welcoming site for learning. We observed that, despite the fact that they could be used for the same single student study that represent the dominant pedagogy across the School, they were often hacked by the students. Chairs were moved into circles or groups (Wilson, Roger, & Ney, 2017). The whiteboards were always filled with equations, problem solving diagrams or allocations of group work. Some students wanted to use more of these collaborative making tools but did not know if they had 'permission' to do, as whiteboards were perceived as the tools of teachers. Equally some of the more complex technological tools for collaboration (such as interactive whiteboards) needed both permission and explicit instructions on how to use them. It was interesting to note that whilst we ran several instruction sessions for the spaces, they were generally poorly attended. Our analysis indicated that students wanted a sense of ownership to make in the space or to break it for their purposes and felt that because it was a teaching building that they did not have that permission. The sense of public visibility that rose from having your making shared by leaving it on the board, or allowing your documentary being shown to passing students or by leaving books or papers on the table, or copies of their edited media on the desktop was perhaps a way of students stamping ownership on the spaces in non-identifiable ways.

Whilst the occupancy levels of the spaces were extremely high (between 80-90% during peak traffic times), the students were only observed in conversation in less than 15% of those times (which could also be a conformation bias issue in that because they were being observed, they chose to 'behave'). The behavioural aspects of the dissonance of experience and usage was a critical insight for the design team. We wanted to try and support collaborative practices outside of closed group study rooms and to signal permission that these spaces could be used for those purposes using technology and furniture. Student however seemed bound by behavioural tropes (such as being quiet in spaces) that had evolved through experience and mirroring the behaviours of others around them. Even though this building was one of the most trafficked sites on campus with thousands of students entering and exiting rooms on the hour, the students still engaged in quiet, contemplative refuge in these sites, even when working together, sometimes resorting to whispered or more intimate engagement (hence the chairs being moved together and the relatively low level of satisfaction with usability of the furniture that could not be moved more closely together).

What was present in many of observations was that when making was happening it was discourse driven, learning centred and initiated by the student. We did not tell them to start making, nor did the spaces give explicit instruction to engage in making (in the main they happened later at night or after we had been there undertaking observations). The students used the space to engage in the making practices that helped their learning. Making in this context was both individual and collective. It was in part aligned with problem identification and with the making of a solution. It left the design team with some significant further challenges for the next project. How could the School overcome the dominant (almost expected) behaviours of learning in University owned spaces in order to signal that collaboration and making is encouraged?



Picture 2: Students engaging in making in the Rotunda Learning Spaces (shared via Instagram)

Experiment 2 - The Hive Studio

In 2016, the design team was asked to develop and design a technology rich space in an underutilised computer room in a windowless basement. We approached the design process with a clear intention to develop a space where making was more explicitly facilitated and actively encouraged. We also wanted to change the nature of computer rooms spaces which from two previous projects where we had observed to be quiet spaces which could generate tension and sometimes outright conflict between students who ‘camped’ at computers even when away from the keyboard or who actively chastised other students who made noise. This is a common behavioural trope in many quiet study spaces such as libraries (Bedwell & Banks, 2013; Regalado & Smale, 2015). The starting point for this design was to provide more spaces for social science making and to encourage students to unlearn the learned behaviours of studying in quiet and individual spaces. The end result was the Hive Studio, the School’s first ‘loud’ computer room, where talking and sounds from media making and collaboration were encouraged and not behaviourally frowned upon. Learning from the RLS, we actively signalled that talking and group work was ‘allowed’ in the space both using technology and putting the lounge and whiteboards in the centre of the room.



Picture 3 – The Hive Studio, showing collaborative screen sharing (left) and writable problem-solving booth (right)

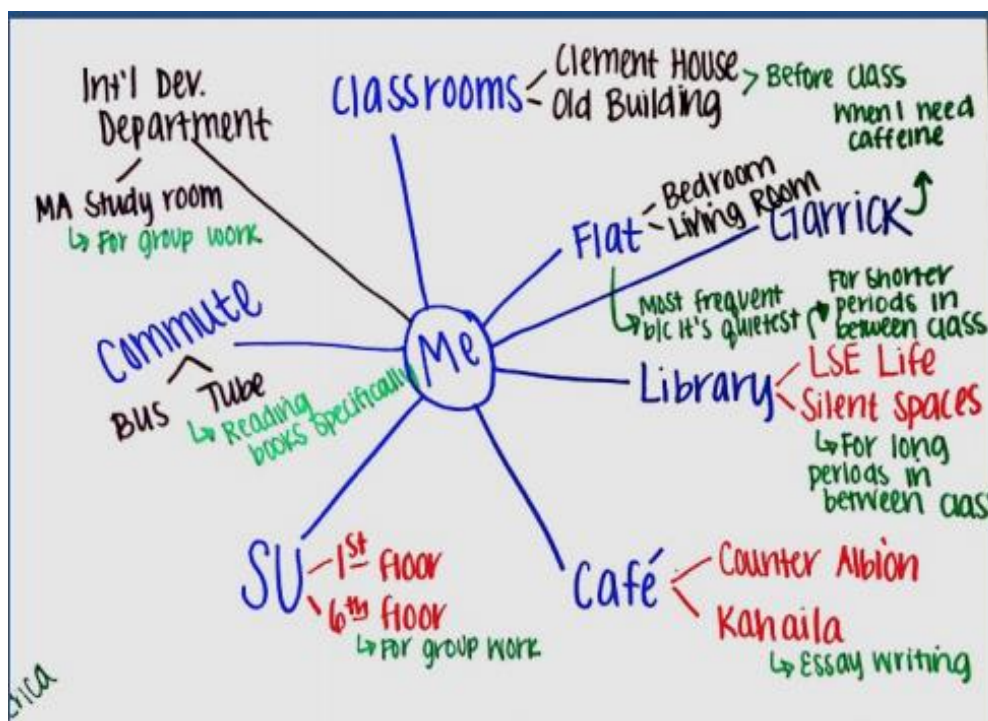
The space featured multiple ways of supporting social science making, from the capacity to make and edit media on high-spec editing Macs, through to screen sharing in pods of computer (see Picture 3 – left). The space also supported more physical ways of making through in the form of problem-solving booths inside and outside the room. There were writable surfaces everywhere in the space, including behind the computers. Aesthetically, we drew on the design of co-working spaces (lights, exposed industrial ceiling etc) to signal to students that this was not a normal computer room. The colours of the furniture and room thematically linked the room and the kind of activity we were foreshadowing by calling the space ‘The Hive Studio’. In the early post-occupancy observations, we did not see evidence that the loud nature was being subverted, however as with the RLS the technology that was introduced was underutilised, resulting from either a reticence to use it or a lack of understanding that it was

there or how it was used. That permission to use the tools of making was less difficult to give around the writable surfaces as the addition of magnetic marker holders seemed sufficient to enable students to use these tools. The same could not be said for kit like the collaborative screens.

Conclusion – Navigating the Village

These experiments represent just two examples of nearly twenty spaces designed by the design team at the LSE over the last four years that have challenged the dominant learning pedagogy of singular and individualised study, aligned with a commensurate strategic approach to assessment diversification across the School. These experiments in the design and delivery of learning spaces were deliberately open in how they defined making, but more prescriptive in their intention to shifts the ways in which students studied on the campus. Most of the experiences described in the literature on makerspaces in universities argued that these spaces centralised and located making with technology or tool rich environments. Putting the makerspace in the library can signal to students that making is an intrinsic part of the study process, located exclusive of the discipline specificity of classrooms and department spaces (Moorefield-Lang, 2014; Shapiro, 2016).

One of the key insights that emerged from the RLS project was that students occupied a suite of spaces in and around the School for different study, social and learning practices, some of which were physical and others of which hybridised physical and virtual spaces (such as the use of the Virtual Learning Environment or social media). The RLS and Hive Studio spaces were part of their journey in and around the campus, stopping at different sites for convenience, for purpose, for availability or for habitual reasons. During the RLS interviews we were able to map these spaces across an undefined study period for the students who participated. *Picture 4* shows how one student mapped this village approach to their use of spaces, which shows how they travelled between their home, their commute, and into their time spent on or around the campus. These village maps showed that students, when faced with critical assessment, study or even learning challenges, developed strategic and pragmatic approaches to how they responded to those challenges. They used technology to bridge gaps in both access and capability, they identified conditions and environments within spaces to support a range of activities and most critically, the taught themselves how to engage in learning through making. What was also apparent in that students did more than do their University work in these spaces. They socialised, they maintained their networks and connections and they engaged in reading and watching behaviours not related to being a student at the LSE.



Picture 4: Mapping learning spaces across the School (Wilson et al., 2017)

Technology (and specifically their own technology such as mobile devices, laptops and social media accounts and platforms) were critical navigators and enablers of learning within their own self-styled village, bringing making and connections into virtual and physical spaces alike. One student described how she navigated her learning journey (which touched on some of the aspects of social science making) using technology:

For my studies I use my smartphone. For the majority of it it's my laptop. I look at readings on my laptop. I take notes on my laptop. Sometimes side by side I'll have the readings, the pages I'm taking notes on concurrently so I can switch back and forth very easily. If I want supplemental information, I can very easily Google up certain things I might have questions about or articles I might immediately relate to any theoretical concepts that I am studying or practical studies that I'm looking at the supporter, or how to degrade it. I also use Facebook when I see a particularly interesting concept that either makes me mad, is quite controversial or I really agree with or something that I'm trying to puzzle out. So, I will reach out to social media and ask my friends, okay what do you think about this? Do you agree with this? Where do you think this might be wrong or where do you think it's strengths are or how controversial the statements are, how they are wrong in all the wrong ways

(Student from the LSE2020 project (cited in Liote & Axe, 2016))

The disaggregation of learning across many spaces located in the bounds of the village of one challenges some of the notions of the importance of developing a sticky campus where students stay within the borders of the University to generate a vibe and buzz of a busy, humming common. But as student numbers continue to grow, density of site usage increases and timetables are spread more widely across longer hours in a week, the span of the village spreads further and further. Social science making does not have to happen in a makerspace or a study room. It can happen on social media, with files shared through the cloud, facilitated using web conferencing and messaging apps. For the modern University the challenge of maintaining and improving both the technological infrastructure as well as the expensive physical spaces demanded by students is a prescient and strategic one. For the LSE, they have addressed this challenge head-on by locating making (students as creators and producers) at the centre of their LSE Education for Global Impact approach (Fung, 2018). These activities have now been located in the heart of the campus in the Centre Buildings project, which have embraced a learning commons approach built on the insights that came from the RLS and the Hive Studio, which The Guardian in their review of the building described as '...it's a sort of studios and cleaned-up Naples, a unique multi-storey fusion of civic and academic space. It's a hive, an anthill, a rookery... insert your zoological metaphor here' (Moore, 2019). These changes in part recognise that social science making is a complex part of teaching and learning at the School that represents both the studios and busy nature of the work, but also that like a Hive some of the work happens outside of the space, which can eventually be the hub that brings all the activity and making together in one shareable and visible location.

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