Informal learning spaces and their impact on learning in higher education: Framing new narratives of participation

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Evaluating informal learning spaces in higher education institutions needs to respond to the complex conceptual orientation underpinning their intention and design. This article outlines a model of participatory analysis that accounts for the conceptual complexity, lived experience and broad intentions of informal learning space. Further, the article contributes an educational language and orientation to the learning space narrative to inform post-occupancy evaluations and future projects.

A key response to the demands of higher education in the twenty-first century has been the recognition of the need for student-oriented teaching and learning environments (Jamieson, 2003; JISC, 2006; Keppell & Riddle, 2013; Scholl & Gulwadi, 2015). Considerable investment in higher education facilities has taken place across the world. Yet a paradox is emerging between this investment in built space and approaches to teaching and learning that emphasize online, flexible, or mobile learning. What this means is the emergence of built informal learning environments on campus. Predominantly, the development of institutional teaching spaces and informal learning environments has been informed by principles understood as foundational to a student- centric and meaningful experience (Finkelstein, Ferris, Weston, & Winer, 2016). For this field of study to mature we must adopt evidence-based models of occupancy-assessment to justify continuing investment, inform future designs, and maximise the learning potential for students occupying the spaces.

This paper argues for the complexity of the conceptual orientation and the importance and contingency of the lived experience; and adopts an ecological model to accommodate the numerous intersecting concepts relevant to this field. Here we outline a project that will develop a post-occupancy evaluation model grounded in our conceptualisation of learning space and use, pedagogical coherence, and a robust methodology combining qualitative and quantitative tools. We develop and use the Learning Spaces and Participation tool (Fig 1) to evaluate informal learning spaces across multiple locations on a single University site in a regional city in Australia.

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Conceptualising higher education learning and the role of space

The contemporary higher education campus is made up of multiple nested spaces, with interaction and connectivity between institutional environments and spaces more representative of school-less contexts (Author, 2017). The recontextualizing of campus learning environments includes a transition to more unstructured and informal settings. This built-informality assumes that both the educator and learner are able to modify and adopt teaching and learning behaviours appropriate to these spatial modes (McAuley, Stewart, Siemens, & Cormier, 2010).

There is a complementarity between pedagogical theory that is student-oriented, mobile technology enabling personalized, learner-centred, situated, collaborative, and ubiquitous learning (Collinson, 1999; Solvberg & Rismark, 2012), and learning environments that accelerate the possibilities of where, how and when learning occurs. Thomas (2010) recognizes that the majority of learning occurs in spaces not intended as learning spaces. Informal learning environments afford a space where these transformative drivers may potentially intersect.

This raises the question of how higher education students experience campus-based informal learning spaces. We consider that students will interpret, participate and react in a dynamic way to the constraints and possibilities of each new context, given their need to achieve the purposes of education (J. Greeno, 2009). A generative way to characterize student use of informal space is to use Sfard's (1998) metaphor of participation. This is consistent with theoretical accounts of the interaction of space and the availability of learning modes (Boddington & Boys, 2011; Jamieson, Fisher, Gilding, Taylor, & Trevitt, 2000; Lippman, 2010). This raises questions about how higher education administrators and

educators conceptualize the scope of participatory practices of their students who are learning through interactions with space that are markedly different from recognized traditions. It is also interesting to consider the assumptions we make about student use of informal space; or, indeed, the student perceptions about the possibilities and constraints these spaces provide for contemporary approaches to learning.

The conceptual orientation allows us to establish a set of questions to guide the collection of data and inform users – designers, lecturers, and administrators – as we progress toward evidence based understanding. What choices do students make about when, how and why they use these spaces? How are these choices influenced by, and how can they influence, institutional learning processes?

Principles-based approach

Recent space design in higher education has been largely based on a set of principles understood to generate conditions conducive to certain learning behaviours. The new spaces do not, by themselves, challenge the existing traditions of lectures, teacher-oriented 'broadcast' or instructional learning and formal curriculum structures; however, they are recognised as powerful embodiments of what is possible as much as what is not. Consequently, where traditional spaces embody particular approaches to learning, reimagined spaces offer affordances of a different kind (Thomas, 2010). The prevailing set of principles generally aims at spaces that are fluid and responsive to a range of student needs consistent with the twenty-first century context: collaboration, agility and connectedness. Further, the principles are a response to the increasing importance of student experience measures with a clear link to spaces on campus generally and specifically (Scholl & Gulwadi, 2015). Moreover, they are linked to student engagement at a thematic level in the United States: academic challenge; learning with peers; experiences with faculty; campus environment; high impact practices (Finkelstein et al., 2016)

This approach has led to particular principles emerging as dominant. Across the previous two decades, the principles have developed toward broad conceptual categories-- Multiple uses; flexibility; vertical integration; teacher and student control; alignment of curriculum; maximise access (Jamieson et al., 2000). Comfort level; aesthetic impact; fit out; layout (Jamieson, 2003, pp. 130-131). comfort; aesthetics; flow; equity; blending; affordances; repurposing (Keppell & Riddle, 2013, p. 31). Keppell and Riddles's (2013) most recent work develops a useful set of categories though we recognise them as belonging to and predominantly informing the

design phase. We acknowledge the limitation of a principle-based conceptualisation – especially as the task of collecting and analysing data enters a new phase. This new phase enables us to contribute an educational lexicon drawing on learning and ecological principles to augment the design narrative.

How do we advance our conceptual understandings to frame a robust and data driven post-occupancy evaluation?

Here we seek to problematise the area by examining the conceptual density underpinning the study of space and student use. Further, we see this as necessary in developing meaningful models for assessing the spaces in use. Advanced renderings of this set of goals demands a new conceptualisation required to understand the lived experience.

Our understanding of learning space is premised on spatiality: that space is understood as a social construction within a broader sociocultural milieu (Boys, 2011; Lefebvre, 1994/1974). Further, that space is conceived and experienced as liminal (Sellers & Souter, 2012) and transitional (Sagan, 2011). We follow the lead of Keppell and Riddle's (2012) distributed learning spaces with an emphasis on diversifying physical and virtual learning spaces. Our work is also informed by affordance theory (Author, 2016; Gibson, 1977; J. Greeno, G, 1994) allowing for the reading of spaces in line with intended, unintended, potential and realised realities.

Turning specifically to informal learning spaces we outline interactions and tensions between a student-driven campus experience and formal learning. We frame this by using Sfard's (1998) metaphor of participation with its emphasis on learning activity as situated, embedded in and mediated by socio-cultural processes. Participation is relevant as it is concerned with "patterned human processes, both individual and collective" (Sfard, 2006, p. 22). Participatory analysis is concerned with activity, practice or patterned human processes (Sfard, 1998).

Informal learning spaces can only be seen as being embedded within institutional space. Participation in activities in these spaces is a function of the larger, encompassing institutional entity. Although informal spaces do not stand apart, perhaps they are more dynamic places, expressing and authorising concepts of school-lessness, flexibility, democracy, agency and community (Author, 2015). Our analysis of the student use of informal space is premised on a three participatory conceptualisations of learning activity. These give primacy to teaching and learning interactions as the drivers of space use.

Educational & Teaching Structure		Ecological Model
Collective and routine teaching activities		Inherent complexity of educational space demands a focus on critical participatory processes.
Includes the sphere of influence of formal teaching moments, including assessment tasks		The interactions and interrelations (left) map these processes in a spatial context.
Individual agency and approach to learning		
Individual and social occupation and re-occupation of formal and informal structures – both physical and organisational		

Figure 1. **Learning Spaces and Participation: Post-Occupancy Analysis**

First, the purposeful influence of structured teaching processes. We assume there are recognisably collective routine learning activities cognisant with the embedding of informal learning space in institutionally structured social and cultural environments. These patterned activities include completion of required formal learning activities including assessment tasks. These comprise exams, test, quizzes; assignments, essays; readings, reflection; projects, inquiry and research tasks. The design of our post occupancy tool will consider how these formal routines of learning play out in informal space.

Secondly, the exercise of individual approaches to learning. While these teaching-driven routines influence activity in informal space, we also seek to identify individual and social variations and innovations apparent in relation to the action possibilities of informal space, and which apply a dynamic reactivity to the cyclical occupation and re-occupation of space. The design of our post occupancy tool will consider how students reconcile their approaches to learning with the affordances of informal campus space.

Finally, following Aldrich and Pfeffer (1976) we understand that our analysis will need to address the complexity comes from the ecological nature of any educational space. This consideration means the modelling of post-occupancy evaluation will account for this complexity by identification of critical participatory processes.

Holling (2001) suggests that complex systems are likely to have a relatively small number of controlling processes. Here, we suggest a model of interactions between the learning environment and each occupant's perceptions of contextual constraints, uncertainties and possibilities that influence participatory practices (Aldrich & Pfeffer, 1976). Figure 1 outlines these three processes.

Further contributing to the student experience in relation to the learning environment is the provision of an educational environment that affords student learning (Douglas, Douglas, & Barnes, 2006); creation of learning communities (Strange & Banning, 2001); a sense of engagement (Owston, York, & Murtha, 2013); provision of informal opportunities for students to discuss, problem-solve and communicate (Douglas, Douglas, McClelland, & Davies, 2015); and attention to social and relational aspects of teaching (Edwards, 2005). The above is particularly important for regional campuses, where the campus community experience is of specific significance (Coates, 2006).

These are not simple relationships, but can be framed using an ecological model. It is acknowledged that any model of a complex system cannot include all specific details, but rather focus on critical components (Levin et al., 2013). Our challenge is to identify the essential details of participatory processes that define use of informal space.

Consequently, evaluation of informal learning spaces and the learning experience in higher education must account for the lived experience. Post-occupancy assessment models need to respond to this conceptualisation and consider the following: create links establishing the role of informal space to enable communities of practice (specific to disciplines); be responsive to the particular context of experience and respond to the student behaviour within the context and the discipline traditions of the community of practice; and establish a robust methodology seeking multiple data sets to establish a clear evidence-based assessment.

Our study will employ a multi-fold data collection model to answer the questions set out earlier in this paper: What choices do students make about when, how and why they use these spaces? How are these choices influenced by, and how can they influence, institutional learning processes?

A detailed survey of use and intention (n=300) will establish student intentions and understandings of the potential of the space. Then, observations will be conducted across 2 semesters through regular focused observation and monitored using a 360 degree camera reviewed to generate a heat map plotting usage. Also, consideration of the links between formal learning and informal space use will be documented. Finally, follow-up open-ended interviews will be conducted (n=20) to collect student reflections on use and potential. Taken together, the data will allow for a rigorous audit of space use that can be considered in light of perception of space and its possibilities. The analysis will be conducted by a multi-discipline team of academics, drawing from Health Sciences, library and the University architect. This team provides a further layer of discipline tradition to establish robust analysis and conclusions.

We continue to consider a set of key questions arising from broad conceptual ideas that have shaped the orientation of our study and that will influence the outputs from the study: how are students using spaces to learn in entrepreneurial ways; what productive or constraining interactions are

evident between pedagogy, learning and space; how do students balance individual and social approaches to learning; are there spatial hierarchies of use with different spheres of participation; and how is technology mediating learning off and on the institutional grid?

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