

Materialising the Studio. A systematic review of the role of the material space of the studio in Art, Design and Architecture Education

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Materialising the Studio; a systematic review of the role of the material space of the studio in Art, Design and Architecture Education

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Abstract: In art, design and architecture education, the ideal of *learning together* is intimately bound up with the notion of the studio as a space where students learn alongside (or under the guidance of) an ‘expert’ tutor (Schon 1987). This is a cherished and central tenet of art, design and architecture education, and a large body of research literature has developed exploring the various dimensions of students and tutors *learning together* in the studio.

However, in an era of managerialism and the massification of higher education, the status of the art, design and architecture studio is increasingly precarious. And although the literature on studio-based pedagogy continues to grow, little directly addresses the role of material space and its contribution to learning. There is, then, a need to articulate the role of the material space of the studio in art, design and architecture education.

To address this, a systematic review of the literature was undertaken to identify the major discussions of material space in studio-based education. The process identified 38 peer-reviewed empirical studies of the art, design or architecture educational studio where at least some attention to the material space formed part of the study. A grounded theory analysis of the 38 studies identified six major themes on the role of the material space of the studio in education.

The goal of this study is to enrich our understanding of learning in art, design and architecture by examining the contribution of the material space of the studio to educational processes. In particular, by looking at the how the material space of the studio is discussed and conceptualised in the literature on art, design and architecture education. This study extends the idea of ‘learning together’. Moving beyond the ‘heroics’ and flesh and blood of ‘expert’ tutors and students. It considers how the studio itself is part of the process of *learning together*.

Keywords: Studio, Education, Space, Architecture, Design

1. INTRODUCTION

1.1 Context

In art, design and architecture education, learning is intimately bound up with the studio – a space where students engage in the process of making alongside, or under the guidance of, an ‘expert’ tutor (Schon 1987). The studio is a visually and materially unique learning space, and perhaps the pre-eminent ‘signature pedagogy’ of the creative disciplines (Shulman 2005). Frequently described in the literature as indispensable or integral to art, design and architecture education, the studio is a “pivot and gathering point of all knowledge” (Mostafa & Mostafa 2010: 310).

The studio is also a remarkably durable concept both across disciplines and industrialised countries (Crowther 2013) and has been central to art, design and architecture education for over 100 years (Orr and Shreeve 2017). Although no definitive description of the studio prevails, some core features can be identified: the specific use of material space, project-based learning, learning-by-doing and the requirement for students to experience physical, temporal and cultural immersion. These features support the central purpose of the studio; developing independent and/or professional creative practitioners (Orr and Shreeve 2017).

Yet, in some higher education (HE) contexts (see UK, US and AUS), the status of the studio is increasingly seen as ‘precarious’ (Heywood 2009). In its ideal form, studio education requires limited class sizes, large spaces for students to work and inhabit, with access available around the clock and the possibility for work-in-progress to be on constant display (Boiling, Siegel, Smith and Parrish 2013). In addition, studios often accommodate, or are co-located with, specialist resources and technology. Accordingly, studio education is viewed as resource intensive and expensive, especially when compared with many other HE disciplines. This has resulted in studio education coming under increasing scrutiny, particularly in a marketised HE system (UK) seeking financial efficiencies (Shreeve, Sims and Trowler 2010).

In parallel, the continuing expansion of HE (in a UK context) is altering the culture of studio learning. The studio ideal, where each student has a distinct workspace, is for many, part of a bygone era of creative education. In a study of communication design studios (UK and AUS) Marshalsey (2015: 337) differentiates the current “qualitatively different communities of practice” from a “previous” and “less-crowded era”. Similar issues have been noted in a US context (Boling, Schwier, Gray, Smith, & Campbell 2016). The transformation wrought by significant changes to staff-student ratios and increasing pressure on available studio spaces (Marshalsey 2015) suggests the impact of these new models of occupation and interaction is largely unclear.

However, the pressures brought by demands for financial efficiencies and increased numbers have led to substantive concerns about the consequences of inadequate resourcing of specialist creative spaces (Marshalsey 2015) and the impact on disciplinary teaching and learning models (Boddington & Boys 2011; Harrison & Hutton 2014; Rodgers & Jones 2017). Indeed, Shreeve et al. (2010) argue the studio ideal has already been eroded. Furthermore, this has happened over a period when the possibilities of the ‘digital or virtual studio’ have led some to question whether the physical studio is a dated concept (Heywood 2009).

Given that the physical studio is considered central to art, design and architecture education (Orr and Shreeve 2017) there is a need to provide richer accounts of its contribution to learning. In doing so, we might be able to better 'defend' it from further erosion and inform future adaptations in response to changing needs and budgets. Yet, the enduring precarity of the studio (Heywood 2009; Shreeve et al. 2010; Rogers and Jones 2017) suggests educators and researchers still struggle to articulate the contribution of studio space to learning. Although, it is important to see the struggle to articulate the role of material space as part of broader lacuna in educational literature rather than within a specific community.

1.2 Challenges of Space

Discussing the relations between learning and space is fraught with challenges. First, space is commonly treated as an environment in which social activity takes place, rather than being integral to its occurrence (Giddens 1979). Consequently, material space becomes an invisible backdrop for the "complexity and vibrancy" of social space (McGregor 2004:1) and this works to render space as a "passive container for social action" (McGregor 2004: 350). This in turn works to separate social activity from space, as Jacklin (2001:4) writes:

human and non-human dimensions of teaching practices are pushed apart and relegated to different domains and the ways in which they are interrelated and fused in habituated transmission practices within particular social spaces are rendered invisible.

These observations are supported by reviews of established educational theories. Neary, Harrison, Crellin, Parekh, Saunders & Duggan (2010) reviewed four fundamental learning theories and observed how each "under problematizes" spatial issues. Boys (2011) reviewed 28 learning theories and concluded most failed to acknowledge spatial contexts. Both these reviews suggest educational researchers are not prompted to examine the spatial dimensions of learning.

Underproblematising, or failing to acknowledge, space in relation to learning raises specific issues for educational research, as McGregor (2004:2) discusses in her study on spatiality in schools:

Common conceptions of space as a fixed, physical, container for social interaction are inadequate for understanding what goes on in schools: indeed, the silences around space allow it to be mobilised in producing and reproducing practices which maintain persistent and unequal power relations.

For McGregor, who draws on traditions of critical geography (Massey 1999), space is not just a backdrop to educational processes but, "fundamentally implicated" (2004: 2) in the production and reproduction of social practices, and therefore the potential for unequal power relations. This raises important questions for art, design and architecture education. If the purpose of studio education, described optimistically in the literature as, the production of 'independent creative practitioners' (Shreeve et al. 2010: 132) or described instrumentally in the literature, as the preparation or transformation of students for the professional world (Brandt 2013; Boling, Siegel & Smith 2013), we might ask – *what kinds of artists, designers or architects do our spaces produce?*

Such questions have been addressed concerning the discursive practices of the studio. Oak (2000) argues interactions in the studio both produce and reproduce practices of the design industry and in the process, work to exclude some students – mainly through the demand for immersion. Webster (2007) considers aspects of studio education as a site of power dynamics and privileged male voice. Elsewhere, Brandt (2013) has warned how the unexamined values of the studio can exhibit cultural insensitivity. Similarly, Gray and Smith (2016) caution against the uncritical reproduction of studio and professional norms that can limit the diversity of students in creative subjects.

However, these studies have been preoccupied with the social and discursive dimensions of studio education. If McGregor’s argument that space is “fundamentally implicated” in the production and reproduction of social practices, then it suggests a failure to account for the ways that educational sites themselves “(re) produce existing social values and power relations” (2004:7) in art, design and architecture education.

So far, I have outlined both the *centrality* and the *precarity* of the studio to art, design and architecture education, and the need to better articulate the role of the physical studio. I have also noted some of the challenges of studying space and its relationship to learning. This has implications for kinds of artists, designers and architects our educational processes produce. I will now turn to the central goal of this study, to enrich our understanding of the contribution the material space of the studio makes to educational processes in art, design and architecture. In the next section, I will frame this goal as a research question.

1.2 Research Question

This study aims to contribute to our understanding of the role of the material space of the studio in art, design and architecture. I will do this through a systematic literature review (Aveyard 2010) of empirical studies of studio-based pedagogy in higher education. A literature review is useful because it summarises and synthesises a literature base with the intention to provide new insights (Aveyard 2010). By reviewing the literature, I aim to provide a summary of the ways existing research articulates the role of material space in creative education and establish a platform for further research. The study addresses the research question: *what are the major discussions of material space in the literature on the art, design and architecture educational studio?*

Before outlining the methodology, I want to clarify the term studio. In art, design and architecture studio can mean more than one thing. As a noun, studio refers to a physical space and in professional contexts it often signifies a company. As a verb, studio can describe a mode of engagement or an approach to teaching. This can make the term slippery. For clarity, I will draw on Schon’s (1987) delineation of the term *studio*. Schon identifies four fundamental learning constructs of the studio: i) studio as a culture, groups of students and tutors working together; ii) studio as a physical space in which teaching and learning take place; iii) studio as a mode of teaching and learning; iv) studio as a programme of activity. But we should caution, although Schon’s constructs provide an analytical distinction, it is essential to see these as overlapping and inter-related. In this study, I will focus predominantly on both the studio *as a physical space* and studio *as a mode of teaching and learning*.

2. METHODOLOGY

I undertook a systematic review of the literature (Aveyard 2010) comprising of two stages: first, a search to identify relevant journal articles for review and second, a content analysis of the identified literature (summarised in figure 1.0). The search strategy uses two approaches to determining the

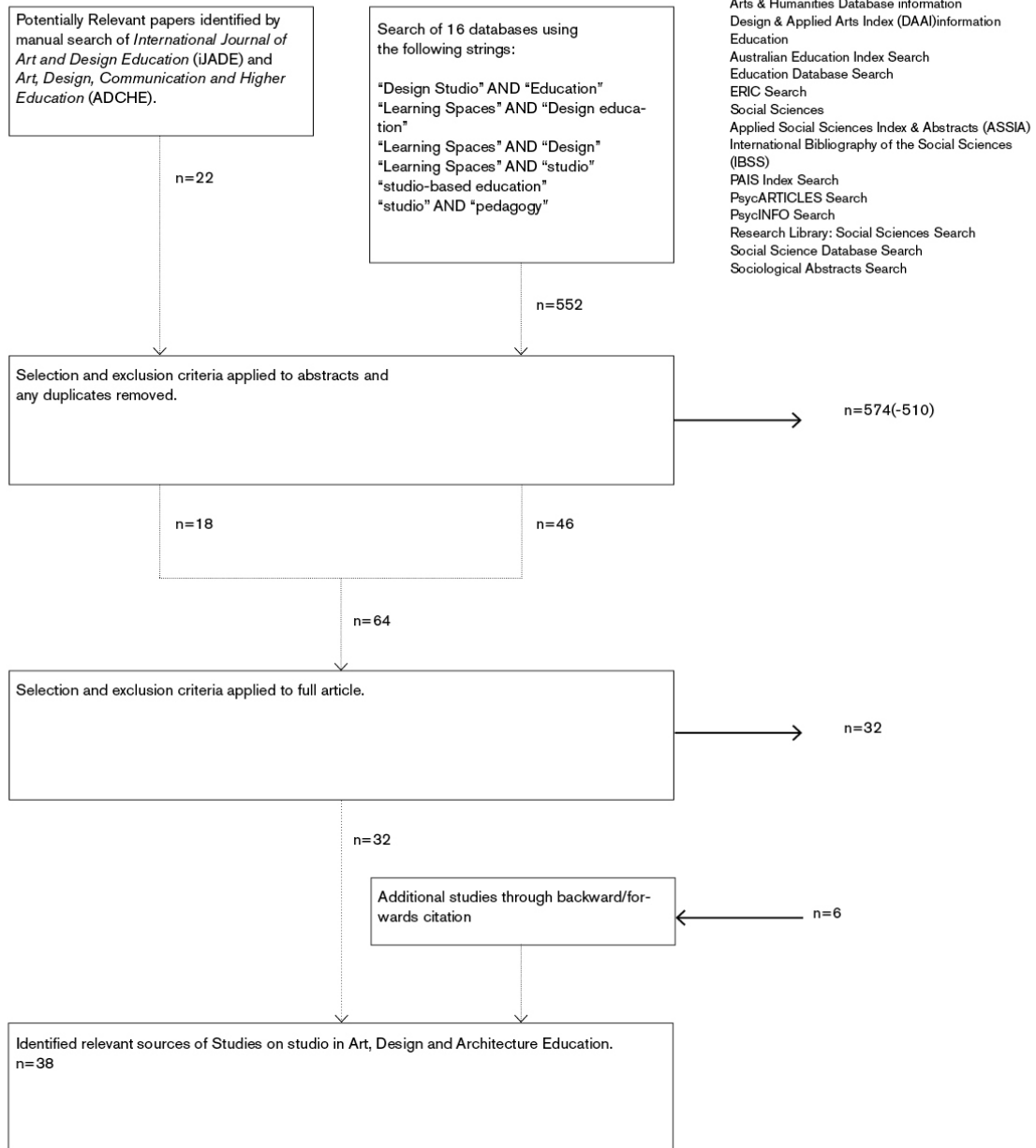
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literature: i) a manual search of two dedicated art, design and architecture journals: *International Journal of Art and Design Education (iJADE)* and *Art, Design, Communication and Higher Education (ADCHE)*; ii) a keyword search of databases.

Working within the period 2000–2017, I undertook a manual review of the *International Journal of Art and Design Education (iJADE)* and *Art, Design, Communication and Higher Education (ADCHE)*. The Journals were selected for their disciplinary coverage and international scope. Initially, articles were identified if the title contained the word 'studio' or if the title suggested the studio was a focus. For each of the identified article, the abstract was read while considering inclusion and exclusion criteria (see Appendices 1.0). This process identified n=18 articles.

A series of keywords and strings were used to search journal abstracts in sixteen databases (see Appendices 2.0) and this identified 552 articles. All 552 abstracts were read and any abstracts not meeting the criteria were discarded, as were duplicates. This process returned n=46 articles. The manual journal search (n=18), and those identified by the keyword search (n=46) gave me a total of 64 peer-reviewed articles. All 64 articles were read in full, again applying the inclusion and exclusion criteria. As a result, a further 32 articles were discarded. The reasons for discarding articles ranged from: articles with a specific focus on one-off interventions, studies that didn't clarify the level of education, studies that focused on particular issues (for example, sustainability, design history or critical writing and were therefore adjunct to the studio), and articles that did not contain empirical research. Finally, 6 additional articles were through backwards/forwards citation bringing the final total to 38 articles. See Diagram 1.0 *Systematic Literature Review Process* for a full description.

Diagram 1.0
Systematic Literature Review Process



2.3 Thematic analysis

The aim of analysing existing literature is to provide new insights through a synthesis (Patton 2015). In this study, it is driven by a single research question: *what are the major discussions of material space in the literature on the art, design and architecture educational studio?*

To address this question, I undertook a thematic analysis of the 38 articles using a grounded theory methodology (Charmaz 2014). I felt this approach would give me a method for synthesising a broad range of literature and because grounded theory uses an emergent approach to analysis, it avoids the imposition of pre-existing categories or theories onto the data. Instead, categories and theory, emerge from the data itself (Strauss and Corbin 1990).

3. RESULTS

This study has set out to address the question: *what are the major discussions of material space in the literature on the art, design and architecture educational studio?* Six themes emerged from analysis of the literature: *studio-as-making*, *studio-as-bridging*, *studio-as-meaning*, *studio-as-enabling*, *backgrounding*, and *studio-as-disciplining* (see Table 1.0). I will now discuss each theme in turn.

Table 1. The major discussions of material space in the literature on the art, design and architecture educational studio.

<i>Making</i> : the studio is a place to make artefacts and selves.	<i>Making</i> concerned how the studio enables students to make artefacts and, to some extent, make themselves as artist, designers or architects.	Shreeve, Sims and Trowler (2010) Cennamo, K (2016) Vyas and Nijholt (2012)
<i>Bridging</i> : the studio acts a bridge between academic and professional art, design and architecture contexts	<i>Bridging</i> concerns the ways in which the educational studio is seen as a bridge between two contexts: the academic and the professional. The studio is the primary site through which students connect and experience these overlapping contexts.	Morton (2012) Brandt, Cennamo, Douglas, Vernon, McGrath & Reimer (2013)
<i>Meaning</i> : the studio confers meaning/s on educational activities.	<i>Meaning</i> focuses on the ways in which the studio generates different kinds of meanings and associations. Activities undertaken in the studio, for example: crits, conversations or projects, were deemed legitimate by some students, but for others, the studio (not being part of 'real practice') delimited the authenticity and therefore the legitimacy of these activities. The same studio is experienced in different ways.	Gray (2013b) Morton (2012) Caldwell and Gregory (2016)

<i>Enabling</i> : the studio enables or constrains activities, experiences and interactions	<i>Enabling</i> (and its corollary constraining) referred to the ways that the material space could encourage (or discourage) particular kinds of activities, experiences and interactions	Marshalsey (2015) Shreeve, Sims and Trowler (2010) Cennamo (2016) Brandt, Cennamo, Douglas, Vernon, McGrath & Reimer (2013) Cennamo, Brandt, Scott, Douglas, McGrath, Reimer, Vernon (2011) Edström (2008) Gray (2013b) Morton (2012) Bachman & Bachman (2009)
<i>Backgrounding</i> : the studio is the background to the activity of learning	<i>Backgrounding</i> (often implied rather than stated) referred to the ways space was a container <i>in which</i> essential activities of teaching and learning took place.	Oak (2000) Morton & O'Brien (2005) Knowlton (2016) Pasin (2017) Savic and Kashef (2013) Smith (2011) Yurtkuran and Taneli (2013)
<i>Disciplining</i> : the studio expresses and shapes disciplinary identities	<i>Disciplining</i> focuses on the role of space in forming student's practitioner identities and suggesting professional norms. The studio isn't just a space to make art or design, but a space in which students 'learned to be' artists and designers.	Boling & Schwier (2016) Svensson and Edstrom (2011) Edstrom (2008) Cennamo (2016) Logan (2008) Shaffer (2007) Nottingham (2017) Dannels (2005) Mewburn (2012) Bachman & Bachman (2009)

3.1 Making: the studio is a place to make artefacts and selves.

The studio is a place where students make artefacts (Oak 2000; Thoring, Desmet and Badke–Schaub 2018). The studio offers a spatial and embodied encounter with materials and tools over an extended period of making (Heywood 2009). The studio, through the ongoing act of making, renders the material dimension of learning visible (Shreeve, Sims and Trowler 2010). Exemplar artefacts (in the form of previous student work or professional practice) are used in the studio during the process of making to both inspire and reinforce professional norms (Cennamo 2016). Shreeve et al. (2010) reported how tutors believed the architecture of the studio affects the kind of work produced by students thereby suggesting the visual and spatial environment of the studio operates in dialogic relation to the process of making. The studio supports the making process in other ways too. In Vyas and Nijholt's (2012) study of design student's workspaces, they focus on how students organise and display items. They suggest the displays around the workspaces are "artful surfaces" that serve a dual function: i) they work as an 'organising and inspirational system' that support the process of making and ii) they function as spaces through which the 'social identity' of a designer or artist is (re)produced in both the methods and choices of what to display.

3.2 Bridging: the studio acts a bridge between academic and professional art, design and architecture contexts

The educational studio brings the varying value systems of academic and professional contexts together (Brandt, Cennamo, Douglas, Vernon, McGrath & Reimer 2013). For some, the studio replicates aspects of professional contexts through a variety of ways: spatial configurations (Shreeve et al. 2010), the reliance on self-management (Logan 2008), the use of professionals in teaching (Morton 2012) and the ways it recreates the rituals and discourses of professional practice (Dannals 2005; Oak 2000). Brandt et al (2013) argue this means the studio acts like a bridge between these spaces, necessarily allowing certain things into the studio. In an art context, Edström (2008) shows how students intentionally use studio conversations to 'situate' themselves in the professional art world.

3.3 Meaning: the studio confers meaning/s on educational activities.

The meaning assigned to activities undertaken in the studio varied between students (Gray 2013b). For some students, the academic studio conferred legitimacy on the conversations and evaluations conducted within it. Conversely, for others, the separation of the educational studio from the realm of professional practice undermined the legitimacy of conversations and crits. Elsewhere, the "inherently social space of the studio" supports international students in making sense of art and design pedagogies (Caldwell and Gregory 2016). However, Boiling Siegel Smith and Parrish (2013) describes the studio as a space of ambiguity with few actual clues to expected behaviours. This ambiguity requires the studio to be 'made coherent' by the tutor. Here the tutor acts to produce meaning in concert with the material space of the studio. This ability to orchestrate the material space of the studio to generate meaning is an essential repertoire of the tutor (Salazaar 2013a).

3.4 Enabling: the studio enables or constrains activities, experiences and interactions

This refers to the ways material space can encourage (or discourage) particular kinds of activities, experiences and interactions. For Crowther (2013), flexible spaces enable flexible pedagogies that cultivate flexible approaches to the open-ended design problems being set to students. The open-ended spaces of studio allow opportunities for 'planned' and 'spontaneous' interactions between students and tutors (Brandt, Cennamo, Douglas, Vernon, McGrath & Reimer 2013). These interactions also develop students' design processes and enhance their understanding of the "studio and professional norms" (Cennamo 2016: 254). Such openness provides opportunities for varying types of support for students from peers and tutors (Cennamo, Brandt, Scott, Douglas, McGrath, Reimer and Vernon 2011). In the case of fine art studios, Edström (2008) shows how students intentionally use studio conversations to access alternative options, to find out how others interpret their work and to situate themselves in the professional art world. The studio creates opportunities for co-location and this enables informal peer critique to support formal studio critique (Gray 2013b). Experiential sensory affects, such as sound and smell, can also disrupt (or enhance) learning (Marshalsey 2015). Spatial organisation is a salient factor in enabling or limiting students' opportunities for engagement in social practices (Morton 2012).

3.5 Backgrounding: the studio is the background to the activity of learning

This refers to the way material space is positioned as a backdrop to learning. The focus of these studies is the interactions between tutors and students, with particular attention paid to discourses. Although they take place in the studio, these studies frame learning as a primarily discursive activity. So, architecture students learn by talking and hearing others talk about the objects they make (Oak 2000). Oral presentation is the primary means by which students learn how to think and act like an architect (Morton & O'Brien 2005). Learning happens through a combination of project work and language (Knowlton 2016).

3.6 Disciplining: the studio expresses and shapes disciplinary identities

Disciplining focuses on the role of material space in shaping disciplinary identities and promoting professional norms. Here, the studio is not only a space for students to make art or design, but also a space to learn to be artists, designers and architects. The studio is a “space of immersion” (Boling & Schwier 2016). For Logan (2008), immersion is signalled through students ongoing presence in the studio. ‘Immersed students’ are insiders – both literally, they are inside the studio (as opposed to working elsewhere), but also socially, being an insider provides students with access to graphic design knowledge. Respondents, in Logan’s study, repeatedly equated graphic design knowledge with being in the studio. Elsewhere, the studio makes possible various kinds of interactions through which students learn the norms of the discipline:

students were not merely solving problems; they were engaged in an iterative process of expressing—and thus shaping—their identities (Shaffer 2007: 121)

Thoring et al. (2018) analysis of the literature on creative spaces and ethnographic study of one site describes one of the functions of the studio as an ‘indicator of culture’. Here, space can express behavioural expectations and encourage professional norms – they give the example of motivational statements that encourage playfulness and creativity.

Nottingham’s (2017:45) study of posters hung on a studio wall describes how “the hallway co-participates the becoming of design students as novice designers”. Nottingham argues the posters and the hallway are not only ‘indicators of culture’ but that they are also doing pedagogic work, in this case cultivating students ‘design eye’. So, the material space of the studio participates actively in educational processes.

This theme is continued by Dannels (2005) who extends, and challenges, the work of Oak (2000) and others, whose focus is on the discursive dimension of learning through the crit. While Oak (2000) and others have argued the crit is the primary event where students learn “what it means to be a professional in the design arena” (Oak 2000:140). To this, Dannels (2005) study notes the importance of “spatial and visual elements”, e.g. the drawings, designs and models on walls to the crit. Dannels (2005) argues that space is a critical social actor in the learning process, performing roles and working dialogically with spoken elements of the crit:

In short, oral genres did not simply occur within the studio space; elements of that space were social actors that took prominent role in genre performance. Part of

being socialised into the design culture, then, was learning that the “space” was just as much an actor as the audience. (Dannels 2005: 155)

Here the material space of the studio works alongside tutors to shape students’ identities. Suggesting the physical studio has a role in disciplining students. Mewburn (2012) has argued a close examination of tutors and students in action shows the tutors to be only one of a host of human and non-human actors all of whom work to 'assemble' the design studio. Here, Mewburn (2012: 377) portrays the design studio as “an elaborate a flexible apparatus of enrolment”. Arguing the process of learning extends beyond tutor-student interactions and discourse. Space, therefore, plays a critical role in forming disciplinary identities, and suggesting cultural and professional norms.

In this section, I have outlined the major discussions of material space in the literature on the art, design and architecture educational studio. I have identified and described six themes in the literature: *studio-as-making*, *studio-as-bridging*, *studio-as-meaning*, *studio-as-enabling*, *backgrounding*, and *studio-as-disciplining*. It should be noted, these categories are not discreet, for example, *studio-as-bridging* (between professional and academic contexts) and *studio-as-disciplining* (how material space contributes to shaping identities) have shared aspects. Nevertheless, the six distinctive, but connected, themes suggest a variety of perceived functions of the role of the material space of the studio in art, design and architecture education.

4.0 DISCUSSION

This paper was motivated by two things. First, the ongoing threat posed to the studio by a combination of increased student numbers, the drive for financial efficiency (in UK HE environment) and the promise of digital technologies. These threats worked to underscore the need to better articulate the role of the physical studio in educational processes. Second, informed by the work of critical geographers (Massey 1999; McGregor 2004; Boys 2011), the need to examine the contribution the studio makes because spatial accounts can enrich our understanding of how learning happens and allow us to ask: *what kinds of artists, designers or architects do our spaces produce?*

To address these two motivations, I undertook a systematic review of 38 peer-reviewed articles in order to address the research question: *what are the major discussions of material space in the literature on the art, design and architecture educational studio?* The findings suggest, perhaps unsurprisingly, there is broad acknowledgement in art, design and architecture educational literature that material space plays a role in learning. But, its role is described in a number of different ways and with differing levels of attention given to material space. In this study, by synthesising the literature, I have identified six major themes that provides some coherence to these discussions. The themes are *studio-as-making*, *studio-as-bridging*, *studio-as-meaning*, *studio-as-enabling*, *backgrounding* and *studio-as-disciplining*.

Briefly, taking each in turn: *studio-as-making* asserts the importance of the studio as a space for making (a central activity of creative education) but also suggests studios do more than house making and shape the kind of work that takes place. *Studio-as-bridging* emphasises the importance of professional contexts in art, design and architecture education. Here, the studio can act as a bridge between academic and professional contexts through the use of practitioners in teaching, spatial configurations or types of discourse, the studio provides a means for students to move

between these contexts. *Studio-as-meaning* describes the way space can either legitimise or delegitimise aspects of learning for students. Despite the studio's status as an authentic learning environment, it can also serve to highlight the differences between academic and professional contexts. *Studio-as-enabling* describes the way material space can encourage (or discourage) particular kinds of activities, experiences and interactions. *Backgrounding* refers to the way the role of material space was frequently subordinated in learning activities. *Studio-as-disciplining* describes how space can create opportunities for immersion where students are separated from other places and activities. Here, space works to discipline students, through objects, interactions and immersion.

By identifying the major themes and synthesising them into distinctive, but interrelated, areas I have provided a set of empirically grounded descriptions of the role of the material space of the studio that can contribute to discussions about the role of the studio. Moreover, the six themes can be scrutinised and tested with further empirical research. These themes may also contribute to debates arising from the growing interest in studio-based education from disciplines outside of art, design and architecture.

With regards to the second focus of this study, that space is fundamentally implicated in social practices and therefore the transformation of students into creative practitioners. A key theme to emerge – *studio-as-disciplining* – suggests it is not only discourse and tutor-student interactions that work to shape the kinds of artists, designers and architects that are made, but that space contributes too. Conversely, we must also caution that space may also work to limit the possible identities on offer to art, design and architecture students.

4.1 Challenges of Researching Space

This literature review has also drawn attention to the challenges of researching the material space of the studio. Addressing these challenges is important if we are to find ways to better articulate the role and contribution of material space in art, design and architecture education.

4.2 The term studio

First, the term studio elides more than one thing: a physical space, a programme of study, a pedagogical strategy and a culture (Schon 1987). The use of the term studio frequently conflates these ideas. We might say this demonstrates an intuitive grasp of the studio as intersecting constructs, but I argue, it simultaneously works to obscure what we have to say about the studio.

4.3 Familiarity

Second, the studio as a physical space is so familiar to those that teach within it that the repertoires of events, objects and procedures that constitute it can appear ordinary and obvious (Boys 2011). This may account for the lack of serious attention given to material space in the literature on design and architecture studio:

[s]tudies on the role of physical space in design studios have been rare in the design community. This is not because spatial aspects in design studios are less relevant or important; on the contrary, the use of physical space has been so implicit in this context that it has for long been taken for granted in the design discipline. (Vyas and Nijholt 2012: 178)

4.4 Focus on Discursive

Third, perhaps as a consequence of the studio's taken for granted-ness, researchers have looked at the tangible and significant events of studio pedagogy. In particular, the discursive nature of tutor-student interactions in desk or group crits. Mewburn (2009) argues this overstates the role of the design tutor – casting them as the primary shaper of students' experience – and underplays the role of materiality, and even gesture and the body in learning.

4.5 Challenges of Space

Fourth, considering learning as a spatial phenomenon is not without its theoretical and practical difficulties (Bligh and Crook 2017). For example, Dannels (2005) raises an interesting idea of the crit wall as an actor that contributes to design knowledge. Similarly, Shreeve et al. (2010) voiced how tutors noticed the kinds of work produced by students was in a 'dialogic relationship' with the architecture of the studio. These observations, interesting as they are, do not get pursued by their authors, suggesting different theoretical and conceptual tools may be required to investigate the role of material space in accounts of how learning happens.

4.6 Lack of studies

Perhaps as consequence of the reasons outlined above, this literature review also highlighted a near total lack of studies that directly researched tutors and student's experiences and use of the material space of the studio in (HE) art, design and architecture education. Such studies might enable the findings of this literature review to be both tested and expanded.

4.7 Limitations of this study

Although publications were selected because they focused on the art, design and architecture studio, the constructs elided in the term 'studio' made both the selection and analysis difficult. This reinforces the challenges of discussing space and the importance of treating the findings in this study as an analytical tool for further investigation.

The vast majority of articles identified came from UK, USA and Australia, and is therefore culturally limited. While a systematic literature review makes every effort to both declare its search processes transparently and use databases systematically it does mean these findings are based on a fairly narrow cultural educational base.

Finally, some readers might ask – where is the digital? I have purposely avoided it in this paper. In part for clarity, in part because of the focus on physical spaces. However, I acknowledge digital 'spaces' are increasing entangled with physical ones in the studio, and a full account of learning as a spatial phenomenon would need to acknowledge this.

4.8 Further Research

This systematic review aimed to identify the significant discussions of the role of material space in the literature in art, design and architecture education and suggests some areas for further research. In particular, the need for research that find ways to make the modes of studio occupation and operations visible. To develop a method and methodology for researching studio space, to consider the way digital space is layered into physical spaces. There is also a need to consider the role of the physical studio beyond the UK, US and AUS HE contexts.

Appendices

1.0 Inclusion and Exclusion Criteria

The criteria for inclusion in the study was used to determine whether abstract identified in the keyword database and journal searches would be pertinent to this study.

Inclusion Criteria

An empirical study of art, design or architecture studio.

Higher education.

All countries.

2000–2018

English Language

Peer reviewed in journal

Exclusion Criteria

I excluded one-off intervention and case studies, there are many of these in art and design sitting somewhere between action research and case study, unless the study was specifically related to physical space. I also excluded any studies of digital or virtual studies, again of which there were many, notwithstanding these might broach aspects of physical space this study was asking the question, studies on assessment were also removed

2.0 Keyword Strings

“Design Studio” AND “Education”

"Learning Spaces" AND "Design education"

"Learning Spaces" AND "Design"

"Learning Spaces" AND "studio"

"studio-based education"

“studio” AND “pedagogy”

“Art Studio” AND “Education”

"Learning Spaces" AND "Art education"

"Learning Spaces" AND "Art"

"Learning Spaces" AND "Art studio"

"studio-based education"

“studio” AND “Art pedagogy”

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