

Developing Curriculum-Led Human-Centred Spatial Design Briefs for Next Generation Learning Environments in Higher Education

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Abstract: There have been major shifts in learning goals, curricula and pedagogy over the past century, particularly the last thirty years. In the last decade the area of learning space design has emerged as a key research focus, policy priority and strategic direction in both schools and the higher education sector. In response to these major shifts, innovative spatial approaches to learning have given rise to 'next generation' learning environments. These environments address a multiplicit and fluid set of parameters and considerations. The rate of change in the sector and in technology, shifts in pedagogy and conceptions of learning, and the needs and expectations of new generations of students all give rise to a far more complex process than the design of traditional learning spaces. In the conception of these next generation learning environments the relationships between the users, curriculum, pedagogy, technology and spatial environments are recognized as fluid and evolving and influenced by a diverse array of stakeholders both within and beyond the campus. Intrinsic to these relationships are strategic directives, objectives and transformative processes acting on macro and micro levels. It is this complexity and interrelatedness that signals the need for universities to not only rethink the typology of environments for learning but also the process for conceiving, briefing and creating them. It is this need, and the paucity of research in this area, that defines the focus of this paper and an Australian Learning and Teaching Council funded research project from which this paper stems. The project is mapping a protocol for the development of curriculum-led human-centred spatial design briefs for next generation learning environments. This paper presents the designerly approach to the research project, the methods for investigation, brief development and the 'tools' being developed and tested.

Keywords: Visual Action Research Methods, Curriculum-Led, Transformative Processes, Participatory design and play, Learning Environments, Photo elicitation

Introduction

FUELLED BY EDUCATION reform and government funding, the higher education sector has seen intense activity in research and infrastructure development in the area of learning environments. Emerging from the flurry of activity in this area is the identification of a critical gap in the process. As Jamieson states, there is a strong need for 'universities to rethink not only the types of physical settings that are necessary (for learning), but also the process for creating them' (Jamieson 2007). This gap has arisen out of rapid change in the sector including shifts in pedagogical approaches and conceptions of learning coupled with the ubiquitous growth and use of technology. As a result the design of next generation learning spaces represents a far more complex process due to the number of variables, the rate of change in the sector and in technology, and the rapidly changing needs and expectations of new generations of students.

There is a growing body of research in the area of design for learning spaces and whilst it provides some useful case studies of next generation learning spaces and broad first principles, there is no protocol to guide those involved through the complex process of conceiving, briefing and creating next generation learning environments. This paper presents a research project that is developing such a protocol. In presenting the research project, this paper will provide an overview of the projects aims and objectives, the methodology for the research, and the methods and tools being used and developed through the iterative cycles of the research investigation.

Project Overview

The research is being conducted in an action research framework, whereby insights gained from cycles of critical reflection and action (by researchers and participants in the field) guides the research process. The aim of this ALTC project is to develop a series of protocols, tools and models to assist in the conceptualization, design, implementation and post-occupancy evaluation of next generation learning environments. These protocols involve stakeholder consultation through various forms of engagement including interviews, focus groups, workshops, journals and surveys. This represents a dynamic soft-systems approach that takes into account the evolving nature and interrelationships of and between space, technology, pedagogy, curriculum and learning as complex open systems or human activity systems (Johnson & Lamas, 2005; Loi & Dillon, 2006).

The project brings together a team of experienced academics and design practitioners who are all in some way researching the development of learning environments. Team members are developing an open, inclusive project framework that draws on the experience of staff from three universities. The team members' research backgrounds and experience in both Education and Interior Design contribute to a rich understanding of the process and aims of learning space design. This expertise brings into focus the relationship between space and its occupants; practices [for example learning and teaching], projects, communications, identities and 'things' (Warde, Borgmann, Verbeek in Stewart, 2008). The research project takes a designerly and participatory approach supported by action research methods for the development of a curriculum led, human-centred design protocol. This protocol aims to facilitate stakeholder engagement through to better understand the evolving nature and interrelationships of and between space, technology, pedagogy, curriculum and learning as complex open systems or human activity systems (Johnson & Lamas, 2005; Loi & Dillon, 2006). The following expands on the key theories and methods that inform the approach and methodology for this project.

Methodology

Next generation learning environments are complex design problems encompassing curriculum objectives, pedagogical approaches, stakeholder expectations, infrastructure and technology appropriateness, alongside the consultation, implementation and evaluation processes (Fisher, 2005). As such, next generation learning environments represent what design theory has referred to as 'wicked' or 'ill conceived' problems (Rittel & Webber, 1973, Cross, 1982) and what soft systems theory terms as 'messy' problems (Checkland, 1981).

Three key characteristics of ‘wicked’ problems that are also applicable to ‘messy’ problems are important to note here;

- There is no definitive formulation of the problem (Rittel & Webber, 1973, Checkland, 1981)
- These types of problems are open ended and have no stopping rule (ibid)
- The planner has no right to be wrong (ibid).

In order to address the complexity and open-ended nature of next generation learning environments the project uses an action research framework. This framework is guided by what Archer has termed a designerly approach to research (Archer, 1991) and incorporates three interrelated action research methods. Each of these methods aims to gain insights through cycles of critical reflection and action by researchers and participant stakeholders in the field.

The Designerly Approach

According to Archer, a designerly research approach is a way of moving from the general to the particular through iterative cycles of enquiry, experimentation or testing to develop an improved outcome. This approach starts with a broad configuration or ‘rich picture’ of what is required, then moves on to developing subsystems, then the details of these subsystems, through an iterative process which tests assumptions at the various stages (Archer, 1991). The outcome is one of a proposition for change and improvement. Three action research methods that are interrelated and complementary were identified to support the designerly approach.

Soft Systems

Soft systems methodology provides an appropriate approach for mapping out the ‘problem situation’ at a Meta level; it assists in framing the ‘problem situation’, its boundaries, elements and interdependencies. As soft systems mapping of complex relationships is open ended, it allows for the ongoing evolution of the different elements within the system. This methodology provides the broad ‘system’ configuration for the project and identifies the subsystems and relationships within it. Soft systems methodology was developed by Peter Checkland, emerging in the 1960’s as an extension of biosystems methodology and hard systems methodology, as a way of applying systems thinking to non-systems situations such as those which incorporate high levels of social, political and human activity (Checkland, 1981, 2006). As in all action research methods this methodology attempts to foster a learning community where the whole stakeholder group is involved in mapping out the ‘problem situation’ allowing them to appreciate and contribute to an understanding of the situation and through this process identify desirable change, needs and actions leading to improvement in the ‘problem situation’.

As in all systems methodology, a broad view is taken of what constitutes the system, what influences the system, who participates in the system and the relationships between these. This methodology was adopted by business in the 1980’s (Senge, 1990) and more recently by design (Cottman & Leadbetter, 2004) as a mechanism for defining the problem situation

and analysing it leading to change, innovation and transformation. This methodology overlaps with the field of human-centred designing in terms of its participatory nature, its relational analysis and its focus on human activity.

Human-centred Design

Human-centred design supports and reinforces the human focus of a soft systems methodology. It provides insight into the dynamics of human practices and experiences in relation to designed environments and calls for participatory stakeholder engagements.

Human-centred designing has been gaining impetus since the 1990's. In that decade earlier user-centred approaches, that incorporate research data about potential users into the design process, were expanded and invigorated through engagement with participatory design techniques developed in Northern Europe (Sanders & Stappers, 2008). These techniques engaged with potential users at all stages of the design process. Rather than seeing user representatives as passive sources of information, participants were actively included in the generative and evaluative process (Sanders, 1992). Respected voices within the field of design research who have contributed to the discussion on human-centred designing include Victor Margolin (1997), Donald Norman (1996, 2004) and Klaus Krippendorff (2006). The resulting field encompasses diverse approaches to gaining insight into the relations between humans and designed things and environments. These approaches range from those that employ empirical or ethnographic research techniques, to more playful, innovative and designerly approaches, such as those developed by Bill Gaver (1999), or by Anthony Dunne and Fiona Raby (2002). Elizabeth Sanders, a leading proponent of human-centred designing, has provided a useful mapping of these approaches and the field (2006).

Curricula-led

Curricula can be described as systems that include students' and teachers' experiences of content, how content is structured and represented, teaching and learning practices, assessment, evaluation and student support, situated within broader administrative, educational, practice and social contexts (Hicks, 2007). The aim here is to encapsulate what has been called design-based research in the Learning Sciences (Reeves, 2006). Design-based research involves using design experiments for formative research through iterative cycles of testing, evaluation, refinement and reflection in collaborative settings (Brown 1992, Collins 1992, Reeves 2006) and complements the other methodologies for the project. The process brings forth the curriculum objectives and the pedagogical approaches, learning activities and technologies that will best support them. By placing design-based research within a systems perspective, a broader conception of curricula emerges. Within this broader conception learning environments can be seen as both places where the activities of the curriculum take place, and as part of the curriculum in themselves, in that students' perceptions of these environments create messages and experiences; messages about what the university sees as valued and important for learning, how learning might take place, the activities that support learning and the overall engagement with and experience of learning.

The above research methods engage with broad conceptions of curriculum, stakeholders and learning environments and through the action research process support the development of co-design partnerships across the stakeholder groups through participatory design. These

partnerships are essential in order to develop trust, ownership and holistic understandings of the learning environment. Therefore the methodologies adopted recognize the breadth and the complexity of the project and enable transformative processes for curriculum, pedagogy and space across diverse stakeholder groups. They do this through facilitating collaborative engagement, open communication, and learning through the related and complementary action research methodologies adopted for the project. Visual action methods introduce images, such as photos, symbols, diagrams and drawings in the action research process, encompassing, for example, research methods such as photo-elicitation, photo-voice, photo journals and concept or relational mapping (Corti, 1993, Hurworth, 2003). Visual action research, like all action research, involves collaborative processes, but here communication is fostered through a visual stimulus.

Collaboration, learning and communication are essential for positive change, particularly in complex contexts that represent socio-political systems with inherent conflict, power struggles and diverse stakeholder perspectives (Petheram, 2008); such as the higher education context. Learning, collaboration and communication are supported through the introduction of images to the action research method as they create a familiar and common language. The method achieves validity through a cyclical procedure of critique, challenge, reassessment and refinement in dialectic of multiple information sources and perspectives (Dick & Swepson, 1994). As in all action research, for the method to be reliable the development and testing of the protocol, tools and models was conceived of as an iterative, stakeholder inclusive, human-centred process which embeds evaluation and dissemination as an integral and ongoing process and provides an environment within which transformation and understanding can be pursued at the same time (Dick and Swepson, 1994).

Protocols, Tools and Models

Ideal spaces for new and emerging educational practice are human-centred, and inclusive of the views of the different stakeholders. As the spaces are conceived differently to traditional learning environments, they will be used differently, and will require different management strategies. The inclusion of teachers, students and facilities managers in the design process will enrich designers' understanding, and foster shared commitment by all stakeholders to the learning practices and curriculum goals that the spaces are intended to support.

Stakeholder engagement and consultation is seen as both an information elicitation process and a transformative process in the context of this project. The stakeholders involved in learning environments represent a diverse and stratified group with differing foci and project priorities that may remain firm or may shift during the course of a project. It was therefore necessary to develop processes, tools and models that allow for a cross-section of views and priorities to be brought forward, understood and discussed. For this discussion to be useful to design brief development, stakeholders need to feel some ownership of the project and have confidence that they are able to contribute freely and openly.

The project has involved participation from a broad cross-section of stakeholders including the university senior executive, students, academics, deans, associate deans (teaching and learning, and research), facilities management, faculty managers, designers and architects, to provide a cohort representative of a 'real project' for useful and meaningful feedback and evaluation. Putting the processes and tools into action is followed by objective evaluation, feedback and further development. The content of the workshops, focus groups, interviews,

creating past, present and future worlds or ‘what if?’ situations in which participants (players) have equal voice, and socio-political stratification is minimized.

The visual cue cards are used in an action research framework and draw on game and play theory to engage participants and facilitate safe or politically neutral environments that allow participants to develop shared conceptual understandings through visual representations, narrative and co-creation. The cue cards can be used in a variety of scenarios in both participatory and collaborative ways, either in one-on-one interviews, workshops, and focus groups, or as expressions in photo journals.

Workshop Envisioning

In the context of this project ‘a workshop refers to interactive, usually one-off, intensive, face-to-face , educational initiatives that require input from all present and result in benefits for both participants and facilitators’ (ALTC Working with Workshops). The workshops are conceived of as both transformative processes, and data/information elicitation, gathering and analysis. Workshops are designed to address different aspects at different stages of the project ranging from curriculum design, pedagogy & technology to learning space design.

The workshop model of stakeholder engagement is seen as an effective means of capturing and sharing a diverse range of views, expertise, and knowledge and a mode for eliciting information in nonthreatening ways. Through the introduction of the cue card tool participants in the workshops negotiate shared understandings through a visual narrative. The visual language of the cue cards is familiar and immediately brings forth feelings, memories and perspectives that are difficult to unlock through traditional dialogue (Harper, 2002).



Action research workshops can take many forms to address specific intentions. The following are three examples that are useful within the context of the project:

Executive Strategic Envisioning – Used to capture culture, values, strategic directions, objectives, ownership, authorship, motivations and aspirations of a group and generally involve key decision makers.

Past Present Future - Transformative process to assist in identifying change that has happened, is currently happening and that still needs to happen. These workshops often bring forth new insights for participants in terms of the perspectives of others but also the scope and rate of change already in action.

Appreciative Enquiry – is a process or positive search that looks for what is currently valued or appreciated, what is working well and why, in order to understand or uncover what supports ‘success’ in a given scenario and how this may be extended or improved. This model is particularly relevant for situations prone to conflict and defensive behaviour.

As a participatory method, workshops, like focus groups promote interaction, negotiated understandings and new insights that draw on participants' attitudes, feelings, beliefs and knowledge of the situation in question (Gibbs, 1997). Workshops, like focus groups, also play on group behaviour, that is, participants seek to develop norms and shared goals or understandings (Lawson, 2005).

Focus Groups

Widely used in market research, focus groups are not as common in social science or design research generally (Gibbs 1997). The benefit of focus groups is the interaction within the group and the opportunities for the eliciting of multiple or shared views within a group context and the reevaluation of individual views in light of discussion. Focus groups draw upon the attitudes, feelings, beliefs, experiences and reactions of participants and allow researchers to uncover what is salient and why (Gibbs, 1997, Morgan, 1988).

Focus groups can either be empowering, with the group working as a unit and trust developing, or they can be intimidating for individuals. The introduction of visual cue cards provides a starting point to prompt or stimulate dialogue and elicit information. Individuals are united through a common non-threatening and familiar stimulus. As with workshops, what is important in focus groups are the insights and information or data brought forth through the interaction of the participants (Gibbs, 1997)

Focus groups can be used in the preliminary and exploratory stages of a project and also the evaluation stages of a project. In combination with other methods they provide for triangulation and validity testing (Morgan, 1998, Gibbs, 1997).

Photo Interviews

The use of visual prompts in interviews is not a new method. It has been widely used in anthropology and the social sciences more generally. Interest in this technique has received renewed attention over the past decade (Hurworth, 2003).

Using images as prompts in the interview situation has several benefits as images are readily identifiable and interviewees tend to respond to photos 'without hesitation'; the familiarity of viewing photos assists in averting the strangeness of the interview construct (Shwartz, 1989). Photos can also act to trigger and enhance memory, represent abstract and difficult concepts, develop community perspectives and enable comparable responses amongst diverse groups (Hurworth, 2003).

Photo interviews can either be driven by images selected by the researcher for the interviewee to comment upon or they can be 'autodriven' by photographs authored by the interviewees to capture their own behaviours and environments. The later form gives the interviewee increased voice and is particularly useful in gaining negotiated understanding of events and relational dynamics (Heisley & Levy, 1991). This technique is similar to reflexive photography where the interviewee takes photos and then reflects on these in the interview.

'Day in the life' Photo Journals

This process uses two to three methods in combination.

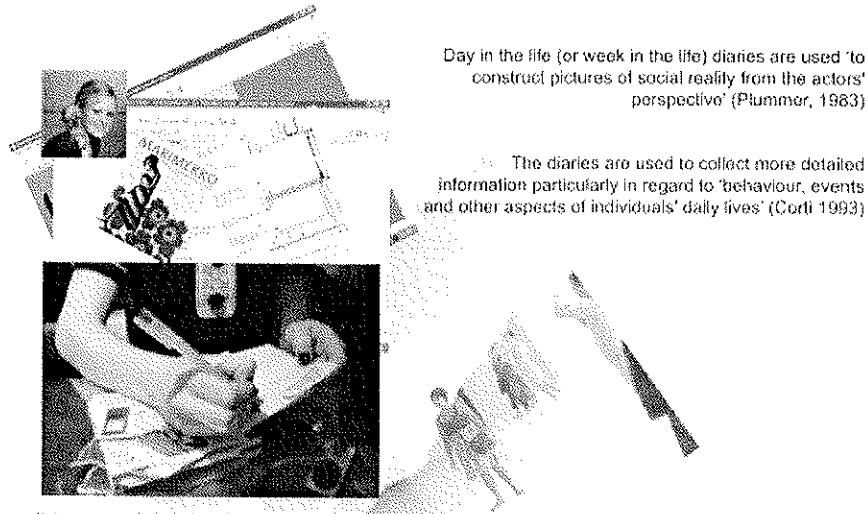


Photo voice methodology, is a form of participatory action research, developed by Wang and Burris, which 'engages the participant as a photographer who captures photos that best illustrate his or her perspective' (Barrett, 2001). A question or series of questions are posed to the participants and they are asked to capture images of what best addresses these questions. Qualifying statements accompany the photos to provide deeper insights. In the same way as 'autodriven' photo interviews increase stakeholder voice, the photo journal represents 'life as they see it' (Hurworth, 2003).

Day in the life (or week in the life) diaries are used 'to construct pictures of social reality from the actors' perspective', in this case the students' (Plummer, 1983, Corti, 1993). The diaries are used to collect more detailed information particularly in regard to 'behaviour, events and other aspects of individuals' daily lives' (Corti, 1993).

Self-completion research instruments such as journals and diaries have a number of advantages over other data collection research instruments. They are extremely reliable as they provide instant recall of events, responses, activities and feelings and can be conducted in anonymous ways to overcome sensitivity about personal information and opinions (Corti, 1993). As a source of information they can supplement interviews and/or focus groups, or become the subject of interviews and focus groups, to elicit more detailed and rich information and insights.

The journals and diaries take on a structured format rather than a free format to allow for easier analysis of the data. Some open or free sections are included in the journals and diaries to allow for greater opportunity for understanding the stakeholders' needs and perceptions.

The aim of the journals and diaries is to record and reflect on what the participants see as assets and concerns. This is a method often used to engage students in the consultation process and allow them to highlight issues of importance that are then critically discussed in focus groups and workshops, and can be used to communicate the issues to policy and decision makers.

Curriculum Mapping

The project team is currently developing tools and a model for curriculum mapping that draws on the three methodologies previously discussed and which will involve visual action research methods. These include the use of the visual cue cards, persona development and concept mapping. The use of these tools and methods aims to promote fluid discussion and development of rich pictures relating to curriculum objectives, learning stances or preferences, learning activities, space and technology in propositional and relational ways.

The above methods of stakeholder engagement will be developed into models and along with the tools form part of the tool kit and protocol for the development of design briefs for curriculum-led, human-centred learning environments and the assessment of their success. The protocol being developed embraces human-centred participatory design, it is therefore fitting for the methods being developed to encompass similar principles and values.

Conclusion

The conception and design of next generation learning environments is a complex process that involves multi-level and diverse stakeholder groups. Through the use of action research methods, in particular visual action research methods, 'rich pictures' can be developed and understandings gained across stakeholder groups through their participation and contribution to the project at all stages, from inception and initiation to occupation and evaluation. Through the use of visual action methods, hierarchies and barriers are broken down and stakeholders can engage in participatory processes that elicit insights, shared understandings and support transformational processes.

Through a designerly approach (Archer, 1991) this project embraces a broad cross-section of action research methodologies with a particular focus on visual action research methods. The methods adopted support a human-centred and participatory approach that is propositional in its nature and promises to elicit 'designerly ways of knowing' (Cross, 1982). Through the generation of shared understandings these methods act as vehicles for promoting and facilitating positive change. Whilst this project is still in process, work to date has evidenced the appropriateness of visual action research methods to the design process as methods for scaffolding participatory processes.

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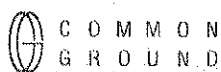
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DESIGN
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Volume 4, Number 3

Developing Curriculum-Led Human-Centred Spatial
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Environments in Higher Education

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DESIGN PRINCIPLES AND PRACTICES: AN INTERNATIONAL JOURNAL
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First published in 2010 in Champaign, Illinois, USA by Common Ground Publishing LLC
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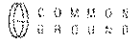
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ISSN: 1833-1874
Publisher Site: <http://www.Design-Journal.com>

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