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The Art of Knowledge Exchange between Urban Design Practice and Post-Occupancy Evaluation: Engaging with Rick Mather Architects and their South Bank Centre Masterplan

Keywords: Knowledge Exchange, Urban Design Practice, Post-Occupancy Evaluation

Knowledge exchange in urban design: the state of the art

Knowledge exchange is a two-way process of sharing knowledge, ideas, viewpoints, and skills. It can mean different things and involve varied activities, depending on the disciplines, actors and types of expert knowledge in question. Although such activities are just emerging in urban design, knowledge exchange between research and practice has rapidly risen up the political agenda in many countries (Decter, Bennett and Leseure 2007). In the UK, knowledge exchange became part of a broader 2007 innovation agenda to inject new ideas into companies and improve their competitiveness and profitability (Howlett 2010). Two key initiatives were the creation of university-business links and Higher Education Academy funding for catalysts to facilitate greater sharing of teaching and research knowledge (Peel 2009). These have engendered many different knowledge exchange activities including contract research, consultancy, conferences and publications, spin-outs and spin-ins, knowledge exchange partnerships, knowledge networks, and internet platforms (Howlett 2010).
Knowledge Exchange or Transfer Partnerships (KEPs/ KTPs), funded by government through the Technology Strategy Board, have been considered the most effective mechanisms (Howlett 2010). These usually imply a three-way knowledge exchange between researchers, universities and businesses. Although these partnerships aim to benefit all three parties, the prime goal is to improve how businesses function and bring innovation to the economy. Universities must bring high-level skills and expertise, and the researcher must have appropriate qualifications to deliver them to business (Howlett 2010). The UK's Economic and Social Research Council has led in providing guidance on best practice in KE (ESRC 2013).

Although KEPs are only new, they are increasing and have already gained a reputation for delivering considerable innovations to UK companies (Howlett 2010). However they are largely limited to science and technology areas. The arts and humanities only joined the initiative in 2010 and few KEP projects have been attempted. These have often failed to grasp the distinctive character of knowledge in creative industries. Tools and models imported from science and technology are poorly adapted to creative disciplines' needs (Crossick 2006). The nature of design and other creative disciplines tends to militate against knowledge exchange (Griffiths, 2007). The environmental design disciplines broadly lack confidence, enthusiasm and rigour in engaging with scientific knowledge. Practitioners' bodies of knowledge are heterogeneous and somewhat hermetic (Marshall 2012).

KEP projects that engage with the design disciplines encounter varied questions and challenges: how is knowledge created, valued, shared and used in the design disciplines, whose outputs generally apply existing knowledge rather than creating new knowledge, and whose processes of knowledge exchange are non-linear and involve complex networks of different professionals, skills, processes and goals (Crossick 2006, Roberts 2007). Addressing these challenges to bridge research and practice requires understanding better the idiosyncrasies of design practice (Chynoweth 2013). Researchers need to understand designers' immediate practice needs if they want to enhance designers' knowledge. This requires a particular methodology of research and engagement. Researchers need to regard experience gained in professional practice as a legitimate intellectual resource. They need to acknowledge that a significant part of this resource develops from tacit, intuitive, practice-centred knowledge (Cross 1990, Caliskan 2012). Such knowledge is generated in action; it arises within techniques of designing, building and using the built environment, and through reflecting on those activities (Cross 2001). Schön (1983) called this 'reflective knowledge'; Cross (2001) refers to 'designerly' ways of knowing.

Researchers partnered for knowledge exchange in this field must recognise that design disciplines

innovate differently to most other disciplines. Designers constantly develop new methods and solutions, but their process often does not conform to conventional definitions of research (Forsyth 2007). Design is typically oriented to creatively solving complex practical problems, not analysing and theorising their own work. The particular nature of design raises important questions for KEP with research, as to how important research might be for the design process, and whether research aids innovation in the art of design. This KEP project builds on existing cognitive studies of how designers work and think, to explore how they might absorb and apply new knowledge and to develop research and exchange techniques that can support their work (Lawson 1980, Schön 1983, Cross 2001, Yaneva 2009, Caliskan 2012). While the knowledge exchange project studied here follows broad ESRC (2013) guidance on the selection of an industry partner, project purpose, understanding the partner's needs, and its evaluation, it reworks these principles in specific relation to the art of design. To so, it uses as a framework the different arts of design that have been theorised so far to reflect upon them and improve the design process. These are: reflective (exploratory, testing hypotheses, move testing, inductive) (Schön 1983, Montague 2013), technical rationalistic (Geddes 1915), conjecture-led (Hillier et al, 1972 cited by Caliskan 2012), solution-oriented (Lawson, 1980), practice based on abductive reasoning (Cross 2001, 2006) and combination of conjecture-analysis-modeling-testing (Caliskan 2012).

A small-scale architectural practice was selected for the KEP to ensure close engagement and significant impact. The KEP had to be shaped first and foremost around the needs and priorities of the practice. One central task of the project is to explore effective ways to engage closely with the practice, in order to discover what designers wish to know, rather than researchers just telling designers what they want to, and how to best transmit and exchange knowledge. Evaluation requires assessing how transmitted knowledge is used, what its impacts are on design practice activities and built outcomes, and how well these outcomes conform to the partnership's agreed objectives. At the core of the knowledge exchange is a set of negotiated three-way feedback mechanisms between design practice, research, and users' reception of the built outcomes.

RMA's urban design practice and the South Bank Centre masterplan

The industry partner selected for this KEP is a London architectural practice well regarded for its sensitive approach to architectural heritage. This reputation was established by their successful adaptation of four notable British museums, following a design philosophy of respect for urban context and architectural heritage. Rick Mather's concern for history was paralleled by an interest in urban design, developed through his 1970s masters at the Architectural Association school and six years' masterplanning experience at the London Borough of Southwark. Although his first masterplanning commissions came in the 1990s, most of his earlier architectural projects had urban design implications. RMA's practice is distinguished by their numerous masterplanning projects for iconic modernist settings, including London's South Bank Centre (SBC) and Centre Point, the University of East Anglia, Milton Keynes, and Harlow New Town. All these projects, once hailed as cutting-edge urban design, have since the 1970s suffered from academics and users the critiques typically levelled at modernist architecture and planning. London's SBC is a definitive example of brutalist modern architecture and functionalist planning. Through RMA's efforts since the 1990s it has recently also become a well-regarded model of urban design intervention to rehabilitate post-war modernism; its once empty and unused spaces have been successfully retrofitted between 1999 and 2007 into a very attractive and active public realm. Neither RMA's practice nor its projects have previously been subjected to in-depth research or evaluation. This provides a useful gap to explore the potential of KEP, to see how academic thinking can learn from practical masterplanning success, and to further enhance the practice's knowledge and capabilities in other contexts. RMA's project leader for SBC, David Watson, also felt that the time was right to evaluate this particular project. Their involvement with SBC had spanned two decades, and had involved many conflicts with conservationists and with the wider public, who had often wanted it demolished. Proposed interventions in the 1990s by other prominent London practices including Terry Farrell and Richard Rogers had been thwarted by the SBC's iconic status. Watson felt that research and knowledge exchange could be useful to help their practice reflect on the long, troubled design process, and to extract lessons that could improve their approach.

Knowledge exchange activities

Fig. 1 – Framework of knowledge exchange project activities

This KEP project ran for nine months during 2013. It explored three-way feedback mechanisms between design practice, research, and user's reception of urban design outcomes. Two components of design practice are examined: the design process and its outcomes, the actual urban design interventions. Processes and outcomes are very different objects of enquiry, requiring different methods. Researching RMA's design process required close engagement, being ethnographically embedded as a participant observer in a variety of activities including weekly project team meetings, and leading regular forums and discussions with the whole office. Researching design outcomes involved multi-method ethnographic study of SBC's public spaces to understand their social performance, vis-à-vis RMA's design aims. These findings provided an external, critical perspective for the engagement activities. The KEP's goal is to use the knowledge gained through research and engagement to offer critical feedback on RMA's design practice, to improve both their methods and outcomes.

Researching the design outcomes

Fig. 2 – SBC masterplan studied locations

An initial understanding of the urban design project's aims and content was gathered from plans, design briefs and stakeholder correspondence. A preliminary analysis of the masterplan guided a pilot phase of field observations in the study area to map the main patterns of users and activities. The main focus here was optional and social activities, which depend the most upon the quality of the built environment (Gehl 1971). These pilot observations yielded initial hypotheses about locations and conditions to be analysed further (highlighted on Fig. 2). These included spaces that were entirely new, retrofitted, and still awaiting intervention. The former categories were the main focus of analysis, because the impacts of design were visible. For undeveloped spaces, the researcher could draw upon the wider fieldwork findings to offer back advice on their design.

Post-occupancy ethnographic study of user experience at the SBC was undertaken during spring and summer 2013. It included discreet naturalistic observation, spatial analysis, and walking interviews with users. This work sought to analyse the benefits, limitations and opportunities that RMA's design interventions posed for social use of the site. Key themes explored in the use of the SBC's public spaces, which drew from the researcher's prior analyses of similar environments, included active frontages, temporary uses, control, circulation, congestion, and open regions. These themes became central to the project's later knowledge exchange activities.

Engaging with the designers.

Examining an office's design process and how to improve it required close, regular, active engagement, as well as creativity and experimentation. This engagement with the office staff began with ethnographic observation of how they worked and behaved. To follow closely their design in action we attended key design meetings and in particular design review meetings. The aims were to follow the design process for the latest phase of the SBC masterplan and other similar projects, and to offer advice on issues raised by the design teams. The designers working on the masterplans were also interviewed to obtain more detailed descriptions of their design process.

To communicate our findings and help the designers reflect on them, we trialled two types of presentations building on the UK's tradition of Continuing Professional Development (CPD) modules. The first was urban design forums involving a lecture on current theories and debates relevant to SBC, followed by short questionnaires exploring the staff's opinions on the presented material, and the office's wider aims, methods and sources of reference. A second format, knowledge exchange talks, were shorter and more informal, and sought to draw upon the field research to evaluate completed and current interventions in the SBC masterplan and the design principles guiding them, and to suggest future improvements.

Design meetings

While the KEP's intended focus was the SBC, that project was put on hold, and the research instead followed several other current masterplanning projects in modernist contexts, including an extension of Harlow New Town and the regeneration of Milton Keynes town centre. Attending design meetings of those projects helped in understanding how RMA generally work and think. However, the meeting format did not allow the researcher to easily interrupt and ask questions. The meetings were useful for understanding the intricacies of the art of design. Although RMA had a clear philosophy and concrete design goals, their design process is not straightforward. At Milton Keynes, RMA have just completed a residential area in the town centre and are now planning a museum extension nearby. Discussions at design review meetings suggest their approach here is, surprisingly, largely intuitive and pragmatic. While they are strongly committed to respecting Milton Keynes' legacy of new town and garden city planning, they have not undertaken any detailed analysis of this legacy. They only did a brief site analysis (Fig.3). The client wants immediate, tangible results, and RMA does not want the site to constrain their design options. For them, analysis only served to identify the major spatial constraints and opportunities, which then served as a basis for their design. Their design brief confirms their proposals were not built upon extensive analysis, but are rather justified in terms of their personal experiences of the site, and their personal assumptions and value judgements about 'good' and 'bad' design in the existing situation, without providing specific criteria. When questioned about such judgments, they responded that this is just how their thought process works. This does not mean their designs proposals were insensitive to context; RMA tried hard to fit Milton Keynes' high Modernist architecture, in their words to 'stay "Miesian" '. They argue that one of their strongest design initiatives was to overcome the fragmentation of the museum's eight existing buildings by unifying them under one 'Miesian' roof.

Fig. 3 – Design review of Milton Keynes' museum extension

RMA's Harlow project involved deeper research. The architects spoke enthusiastically in design meetings about this research process and the important precedent it set for the office: 'It's a brave move from the office. Integrating research is a way to get more confident and get more in control of the design'. The program and the client required this shift. The context was very controversial and politicised. Conservationists and many residents wanted Harlow's modernist legacy extended, but developers wanted something radically new. Unlike with Milton Keynes, for Harlow the designers described the design process in a very linear way. It began with three months of intensive site analysis and sketch design, exploring and adapting an extremely broad range of historical and contemporary neighbourhood design precedents. Without excluding any models outright, they sought to test each's possibilities and limitations. The outcome was six neighbourhood units with distinctly different characters (Fig. 4). A latter two-month phase researched how to improve the neighbourhood's centres, drawing upon Camillo Sitte to establish design principles for squares and streets. According to them, this last phase of research contributed to make a stronger design proposal.

The architects almost never asked the researcher for advice during design meetings. Only in two occasions, they asked about good design precedents that supported their proposals. This indicates their confidence in their own design skills and expertise.

Fig. 4 – Design concept of Harlow masterplan: necklace of six neighbourhood units

Interviews

Interviews covered four questions:

1. describe how you design masterplans; do you identify your approach with any established arts or models of design: These are: reflective (exploratory, testing hypotheses, move testing, inductive), technical rationalistic, conjecture-led, solution-oriented, practice based on abductive reasoning, combination of conjecture-analysis-modeling-testing?

2. is your approach to modernist masterplans different to that for other contexts?

3. what roles do theory and research have in your design process?

4. do you feel your urban design approach is innovative, and in which domain: style, project type, design process, formal or functional analysis, representation, evaluations, or collaboration with other fields or disciplines? (Forsyth 2007)

The first two questions were effective in getting RMA to reflect upon their design process and thinking. Architects are more used to describing their design proposals than their own actions, but suggesting particular process models helped them identify which 'art' they practice. They also often used drawing as a tool to help explain how they work. Their design skills are their most effective analytical tools (Caliskan 2012). Questions about the relation between theory, practice, and innovation were less productive. The office has not often asked themselves such questions.

Two particularly revealing interviews involved an office partner, Gavin, who is their masterplanning expert and an associate, David, who is project leader for their SBC and Milton Keynes projects. Both confirmed the office applies a single design approach to all projects, irrespective of context, modernist or otherwise, architecture or large-scale urban design. Only the Harlow project deviated from this pattern. Gavin characterises their approach as essentially about defining space, although this may have different manifestations. Three goals summarise their approach: seeking the right sense of scale, strengthening outdoor-indoor relationships by promoting activity around spaces' edges, and contextually 'fitting in'. These aims follow Mather's interests in the historical city and in modern architecture's relationship to landscape, particularly through Camillo Sitte and Parker and Unwin's Garden City.

Gavin suggests their design process applies all of the six design models in different moments. He sees their design task as creative problem solving. However, their work is largely driven by rapid, intuitive solutions, which are then extensively tested. For his Liverpool University masterplan, Mather only visit the site once and immediately started sketching, responding intuitively to the site, having little familiarity with the brief. David explained that starting design immediately helps you to ask the right questions, to identify, prioritise and review what information you need. He suggests this is what makes the designer's approach so different from the strict rationale of planners. He believes their practice combines reflective, conjecture-led and solution-oriented approaches, in continual dialogue. It appears that theory often only relates tangentially to their practice: some authors and works inspire them, but their work is not strongly theory-driven. Harlow is an exception, where research and design were closely intertwined. The only constantly-recurring concept in their practice is active frontages, which began with Mather's early restaurant projects in the 1970s.

Innovation in RMA's practice is mostly seen by David in architectural terms: '(the) use of materials, in particular glass in stairs and doors, and in terms of language of approaching the site (…) some (architectural) elements (…) make our practice quite distinctive. RMA are often called sensitive modernist architects after they built white buildings full of glass'. He adds that stylistic innovations in architecture are more visible than innovative urban design solutions. But from the researcher's outside perspective, RMA does appear to have pioneered rehabilitating modernist master-planned

settings. (This was one of the resultant findings from the research undertaken in the SBC). Gavin accepts that their SBC masterplan presents a new way of designing in such contexts: 'If we look back to the previous (…) high-profile (schemes) of Rogers and Farrell (…) both of them (…) were clearly invasive towards the existing structures. Rogers wanted to cover the whole site with a roof. Farrell wanted to knock out all the facades and re-clad them to make them look new. Both wanted to do major surgery. RMA took a different approach, (Mather) tried to work with the existing context and make it work. By understanding what makes space work, he then tried to unlock the space'. Gavin suggests what makes this project innovative is 'the design response that respects the existing buildings (…) identifies the factors to free them up, to allow them to exist and make them work. A key element is an understanding of what activates a space that goes back to Camillo Sitte, how much activity is needed (…) of course this was a controversial point. It was the first time the commercial opportunity was identified. Rick Mather did not have an ideological problem with putting shops. He was utterly eager to put activity there'. RMA's approach to SBC, sensitively introducing active frontages to internally-focused modernist buildings, is a key urban design innovation that distinguishes their art. Having identified this, it was important to use the research and engagement activities of this knowledge exchange project to shape the designer's awareness of their contributions and innovations to the art of urban design.

Reflective activities

Urban Design forums

The monthly lunchtime urban design forums were well attended, always attracting at least 15 of 35 staff. Most participants were, however, young designers, and particularly assistants, the office's most transitory workers. Not all senior staff could spare the time to attend, 'and also not all designers are particularly interested in urban design' (David Watson).

Forum one began with communicating to the staff that the researcher was an architect like them, to put them more at ease. After outlining the research's aims, theories and methods, a participatory exercise asked the staff to map public activity patterns at the SBC to identify potential locations for fieldwork observation. The staff seemed overwhelmed by the lecture's strong theoretical emphasis. But the forum helped shape later exchange. It helped the staff reflect and compelled them to participate; many asked questions about the project. This forum also revealed that although these designers frequent the SBC's public spaces, many don't know its masterplan well.

Forum two, introduced by a lecture on the aims, theories and methods of humanist and formalist urban design traditions (Jarvis 1980, Broadbent 2003), was made less theoretical and more entertaining, with more images and two illustrative short films, Whyte's 'New York Street Life Project' and a BBC documentary about Niemeyer's Brasilia masterplan. White's film in particular had considerable impact, and staff often mentioned it in later engagement activities. The exercise asked what urban design authors the staff were familiar with. The majority, being architects, mentioned Le Corbusier. When asked what authors they identified with, many mentioned Jacobs, Lynch and Cullen, but admitted that they did not read their work. Many said their preferred design approach combines formalist and humanist methods, which reflects the office's sensitivity to both physical context and social dynamics. This forum was key for understanding the staff's conceptual and methodological needs. It revealed inadequate knowledge about, but interest in, humanistic urban design. This forum appeared to change how the office felt about designing; they became more aware of the social impact of their design proposals. Two designers approached the researcher afterwards to ask further advice on methods they might use in their current projects.

Forum three on temporary uses garnered the most interest. Staff responses showed they are aware of current enthusiasm for temporary uses in recessionary London and also employ temporary uses in their practice. They see the benefits of temporary uses to support creative exploration and test design solutions and as tools to identify users' needs. In the SBC, RMA created flexible spaces to allow both planned and unplanned temporary uses. They are also

considering including temporary uses in the University of East London masterplan to fill gaps while the campus develops over time. When questioned about the integration of temporary uses in the SBC masterplan, one participant argued 'they add further depth and excitement to the place beyond just prescribed uses'. Temporary uses may also have the ability to draw new and different users to the space by breaking out of the box of the typical South Bank programmes'. Some staff are wary of the emphasis on commercial temporary uses.

The final three forums focused on demystifying the critiques to modernist masterplanning and architecture, to provide a theoretical base for the designers to give critical feedback on the researcher's analysis of the SBC masterplan. In forum four, a 15-minute lecture critiqued five defining features of modernist architecture and planning–bigness, anti-contextualism, rational order, movement and hardness–illustrating them with key UK and international examples. Three short films about Harlow New Town illustrated shifts from the design expectations of the 1950s, its early life in the 1960s, and decline of popularity among residents in the 80s (related with its perceived failures: spatial segregation and large-scale). The fifth, linked forum screened the documentary, 'Jane Jacobs vs. Robert Moses: Urban Fight of the Century', about Jacobs' battles against New York's 1960s urban renewal projects. This short documentary allowed more time for participation. A questionnaire sought designers' own critiques of modernist architecture and planning principles and their built consequences. Harlow New Town was identified as a failure, although numerous London successes were also noted. Respondents were not well informed about the modern movement's history and were unclear about how to justify an evaluation of the successes and failures of modernist projects. Many simply did not express opinions.

The final forum, spread over two weeks, screened 'The Pruitt-Igoe Myth', about the iconic 1954 housing project demolished in 1976, a moment identified by Michael Graves as the day Modernism died. This film had the best attendance. Fifteen minutes at the end of each session allowed very productive discussion. The film had impact on the designers and generated many questions. Many were interested in what happened later, whether people blamed the architect or the architecture and whether the U.S. government policies that promoted the urban flight of the middle class and created massive housing projects for the poor have changed. During the discussion, the researcher clarified that the purpose of this film was to examine all the interests involved in Pruitt-Igoe's creation and to re-evaluate the world-famous image of its implosion that helped to perpetuate a myth of failure, a failure that has been used to critique Modernist architecture and public housing programs. The film was clearly useful to raise the designer's awareness about the range of social, economic and political factors and contexts that determine a project's success, architecture being only one element.

Knowledge exchange talks

Four months of engagement meetings and urban design forums made the researcher better informed about the designers' needs. Knowledge exchange had to be oriented to practical knowledge and application. This inspired a new format: knowledge exchange talks. Each focused around one urban design principle relevant to the SBC masterplan, in terms of how RMA understands and applies the principle, the concept's theoretical underpinnings, and critiques of its implementation. This format aims to compare RMA's practice against theory, to see how each can inform the other.

The first exchange, about 'active frontages', was very productive. In SBC, active frontages along primary routes were proposed to bring life to numerous dark, underused ground-floor spaces and walkways. Discussion examined four areas proposed for the introduction of active frontages, comparing before and after. The researcher introduced four theorizations underpinning the concept, including Alexander et al's (1977) 'building edges', 'building fronts' and 'pockets of activity', and Gehl et al's (2006) 'ground-floor active facades'. Discussing these theories explored whether they had influenced RMA's approach and also whether there were limitations to this principle's application at the SBC. Media critiques were also discussed, and the researcher conveyed some recommendations for practice. During the exchange, one of RMA's partners suggested the concept of active frontages was present in all their work, although Mather never

mentioned where he took this concept from. Three American architects in the office suggested when Mather was a student at the University of Oregon, he may have been exposed to Christopher Alexander et al's (1975) design research project, 'The Oregon Experiment', which sought to activate that Brutalist university campus. Regarding the limitations of active frontages, the designers felt these arise from the SBC's commercial objectives rather than the masterplan itself. On designer used Jacobs' arguments to suggest flooding a space with a single use can be its downfall. Another suggested too much retailing makes a space generic. Despite these concerns, most of the designers acknowledge retail uses were the most effective active frontages to activate unused spaces.

Forthcoming exchange talks will discuss the researcher's final findings on the SBC, discuss the usefulness of ethnographic methods in post-occupancy evaluation, and revaluate some of the critiques of modernist urban legacy.

Design's feedback on Knowledge Exchange

After six months of engagement, a feedback form was circulated asking staff about the project, its activity formats, the themes discussed, how what they learned may influence their design, and what future topics and formats they would like. The designers were generally positive about the knowledge exchange activities. Most suggested they facilitated reflection and critical thinking. The forums provided an opportunity to develop discourse within the office; staff would often talk about them after work in the pub. People have learned more about the office and its projects and have a stronger sense of office identity. This is particularly important given a significant turnover of staff. Having learned more about urban design, some began seeing architecture from a different perspective, gaining greater awareness of wider urban issues when they design buildings.
 The formats enjoyed most were combinations of presentations and film screenings. Theory gave them a good basis for critical reflection on their work. Whyte's film was particularly effective. It gave staff tools to design outdoor spaces. It made them more conscious about where people tend to sit, where people meet informally, and how to provide appropriate space for people to stand, sit and talk. Some participants suggested allowing more time for active discussions, to identify and enhance the office's existing knowledge and common practices.

Most designers found it difficult to predict the KEP's impact, particularly those who never worked in urban design, who didn't see any direct applicability in architecture. But most found the project very beneficial for the office; they think it can encourage staff to do more personal investigation of the social life of those environments, and draw on successful precedents. Some hoped the design forums would become common practice of the office. They have CPD events and project-oriented discussions, but think it would also be beneficial to have such events around subjects that interest them. It is an important part of the office's culture to maintain links with academia; some have done university tutoring.

Advancing the art of knowledge exchange in urban design

This paper suggests new insights regarding how knowledge exchange projects can contribute to the development of the art of urban design. It shows what can be learned from such projects, and how to use their gained knowledge to improve built outcomes, working methods, and theoretical understandings of urban design research and practice. For research to be useful to urban design practice, it needs to connect in-depth, objective, empirical analysis of built design projects to an understanding of designers' ways of knowing, thinking and acting. It also requires close, regular and active engagement with their practice if it is to respond effectively to designers' immediate needs and thereby improve their art.

One benefit that KEP can bring to the art of urban design is to help design practice become more reflective, and thereby more critical about the social impact of its built outcomes. Urban design is a social art, and knowledge exchange with research provides a distinctive set of mechanisms to

ensure that design does not lose touch with people. This particular project showed that knowledge exchange activities that combine receptive and interactive learning can effectively foster reflection and facilitate critical thinking. A second benefit of KEP is to raise designers' consciousness of their own individual contributions and innovations to the art of urban design. Design disciplines have a long tradition of innovation through practice. But designers are ill-equipped to evaluate their built outcomes and their contributions to practice and theory (Forsyth 2007, Cross 2001, Caliskan 2012). Innovation can be impelled by designers recognising the value of research in evaluating and disseminating their creative work. This project suggested ways of enhancing designers' research skills. One way was introducing new ways of understanding the social performance of the spaces they design, such as this project's post-occupancy evaluation of the SBC masterplan. Another, promoted through the knowledge exchange talks, was giving designers analytical tools for comparing practice knowledge with theoretical knowledge. While the research component of this project may not have immediately precipitated innovations in the art of urban design, it has had an important role in revealing them: one clear finding of this KEP is that RMA are pioneers in rehabilitating modernist masterplans.

This project has tested a model of knowledge exchange between research and practice in urban design, providing new insights into what types of activities can effectively foster knowledge exchange between researchers and designers. Engaging with designers and sharing knowledge requires regular presence in the office environment and active attendance at key meetings, both to build trust and dialogue and to develop familiarity with the distinctive ways they think and design. To enact reflection, engagement activities should combine teaching and interaction. Different exchange activities varied in popularity and effectiveness. Staff attendance and feedback showed that urban design forums (a presentation followed by semi-formal exercises) were popular, particularly those combining lectures and discussion with films. However their orientation toward theoretical debates meant they primarily facilitated critical thinking and had limited direct impact on practice. Conversely, the knowledge exchange talks were less popular, but had greater impact upon their practice, because they were more oriented to practical, applied design knowledge, and provided immediate critical and constructive feedback. The art of knowledge exchange is, like urban design practice itself, largely a matter of developing suitable tools and techniques for the job at hand.

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