

The development of architectural knowledge and research in Britain offers a context in which to interpret a recent study of research across UK architectural schools.

Research in UK architecture schools – an institutional perspective

Paul Jenkins, Leslie Forsyth and Harry Smith

This paper is based on a study into the institutional basis for research in architectural schools in the UK which was completed in 2004 and is publicly available (Jenkins, Forsyth and Smith, 2004). The main aim was to investigate to what extent innovation and excellence in research in architecture in the UK higher education institution (HEI) sector has been influenced by institutional factors; what these factors are; the nature of their influence and what can be recommended for an improved institutional context. While this paper summarises the main evidence from this study, the reader is directed to the full report.

The relevance of this research to current discussion within the architecture academic community has been dealt with in more detail elsewhere (Jenkins, Forsyth and Smith, forthcoming 2006), but is summarised here. This journal hosted a heated debate on the last Research Assessment Exercise (RAE) starting in the last quarter of 2001, beginning with a letter from the Bartlett School of Architecture (Hawley, 2002), which raised the question why, just because its output does not fall into the conventional research categories, architectural research should to be considered less valuable than other forms of research. The leader in that issue ('Time to engage') drew attention to Hawley's letter and called for a debate to be facilitated by the Royal Institute of British Architects (RIBA). The debate seemed to peak in June 2002 when the issue leader argued that the research crisis in architecture went beyond the RAE itself, as well as beyond the UK, and set out what needed to be done:

'Real needs must be identified and matched to available means in academia and practice; valuable unpublished material uncovered; appropriate methods of dissemination developed; and a realistic implementation strategy evolved.' (Leader, *arq* 6/2, p99).

Again in this leader the RIBA was called upon to develop a programme to address this issue, in partnership with practice and academia.

Letters in *arq* 6/2 came from various sources,¹ with the discussion covering a range of issues, including the accuracy of the RAE system in recognising high

quality work; the sums available for distribution through RAE; the issue of 'design as research'; the marginalisation of architecture in the current procurement system in practice; the need for both the profession and schools to look outwards; and the support that the RIBA could give to bridging the gap between the profession and academia. The debate continued to some extent in *arq* 6/3 (September 2002), with the leader reflecting on the occasional problems raised by architectural education taking place within a university context. A couple of letters from the RIBA (Pringle, 2002 and Saxon, 2002) dealt with the need to connect architectural research to education and practice and the role of the RIBA. A key contribution in this issue was a paper on the 'disturbing findings and distorting effects' of the RAE results (Steadman and Hillier, 2000). This analysis sparked a further series of letters in *arq* 6/4 (December 2002) from the University of Edinburgh (Coyne, 2003) and the RIBA again (Pringle, 2003), among others. This led to pronouncement by Jack Pringle of the RIBA in *arq* 7/2 (June 2003), in an interview entitled 'Is the RIBA taking research seriously? At long last, it looks as if it is', providing an update on the RIBA's plans to address this pressing issue.

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A wide range of architecture schools commented in the above debate on issues concerning the RAE 2001 assessment of architecture research, but the debate did not lead to much evidence of continued dedicated attention in either the architecture schools or the professional organisations concerning how architecture research could be better developed, and/or assessed, for some time. What is of interest here, in contributing to the renewal of this debate, is to look beyond the 'snapshot' of architectural research provided by the RAE 2001 (and the more recent position investigated

in 2004), to try to understand how this position has evolved in institutional terms.²

So this paper has two linked objectives. The first is to report, in a summarised form, on the research project, its findings and its recommendations concerning the current institutional context of research in architectural schools across the UK. The second is to reflect on these findings and recommendations in a wider way with a view to considering how architectural research might continue to evolve, drawing on an overview of how research in architecture has evolved historically – both implicitly and explicitly.

For reasons of clarity, definitions of what is understood as *research* and what is understood as an *institutional perspective* in this paper are offered as follows. Research is understood in two complementary ways.³ First, the dominant definition of research is seen as the formal definition within the higher educational institutional environment, which focuses on prior definition of the research query and its contextual relevance (proposal); documentation of the research method (process); and some form of public/semi-public peer review of the research output (product) – for example AHRB 2004.⁴ Second, a wider view of research approaches the development of a discipline from an understanding of relevant knowledge and its production, dissemination and transfer (including ‘storage’ over time), and an assessment of how such a body of knowledge impacts on action in practice, as well as how it is integrated into practice-oriented teaching and learning. This can be seen as the professional knowledge base.⁵

An institutional perspective is understood to include institutions as ways of thinking; here we are interested in what we consider to be ‘research’ and how this is influenced by ‘conceptual traditions’, with reference to architecture. An institutional perspective is also understood to include institutions as organisational structures through which we operate – universities, professional associations, government departments and so on. Here we are interested in how these affect, and interrelate with, conceptual traditions.

This analytical approach is within the traditions of ‘new institutionalism’, where a key contribution is the conceptualisation of institutions as both mental models and as organisational forms. The view taken by the authors is that these interact with each other in complex ways, with mental models becoming operational through organisations, and organisations being underpinned by mental models.⁶

‘A key contribution is the conceptualisation of institutions as both mental models and organisational forms.’

The paper has three main sections. The first is discursive and provides a historical perspective of the nature of conceptual and organisational traditions

in architectural research in the UK. This is used as a means to understand how we have arrived at the contemporary situation as reported on in the research project. The second section gives a brief description of the study, its methods, findings and specific recommendations on the institutional embedding of research in architectural schools across the UK. The third section returns to questions discussing what form of institutional context can best serve architecture research as it continues to evolve.

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The research raises a number of questions. First, what is the organisational context that can best further teaching, learning and research for the profession? Is this exclusively university-based and focused primarily on full-time courses with prescribed content, with some higher research degrees, or can it be partly practice-based (as in the past), with periodic access to learning and research infrastructure? The latter approach reflects the increasing breadth of knowledge required for practice, and the impossibility for this to be included adequately in academic programmes of prescribed length. The part-time routes available at some institutions provide one model for addressing this issue. Further possibilities are currently being explored through the Education Committees of the professional institutions. Second, and equally important, is the question of how the profession is evolving. What does this entail in the longer term in terms of the nature of the relevant knowledge base? The ‘traditional’ architectural role of building design and management of construction has already changed significantly; the main issue now is not how any architect can lead in these areas, but how architectural input can be redefined. Is this exclusively a design input and, if so, is this fundamental or peripheral? Also, should the architect retain a coordinating/managerial role for building production and, if so, what forms of knowledge are needed for this? The discipline needs to be aware of the types and forms of knowledge needed for architecture to evolve and the role of research in the development of such a body of knowledge.

1. The evolution of architectural research

This section is concerned with understanding the findings of the recent research project in a historical context by examining how research in architecture has evolved in the UK, allowing some extrapolation from the ‘snapshot’ of current architecture research in academia which is provided by the recent study. The understanding of ‘research’ here is inevitably

the wider approach defined above, as the use of the more narrow academic definition in the discipline is relatively recent. This analysis focuses on what the role of the architect in Britain has been historically, what has been seen as relevant knowledge for the architect, and how this knowledge has been produced and passed on over time. So it looks at the evolution of the institutional context for the development of architectural knowledge, in terms of both organisations and 'mental models'. The first part of this section draws extensively on Crinson and Lubbock (1994), reinterpreting their findings from an institutional point of the view,⁸ the middle part is based on the survey of the 36 UK schools of architecture that formed part of the authors' research (for more detail see Jenkins, Forsyth and Smith, 2004), and the section ends drawing on Stevens (1998).

'Vernacular'

Building and design traditions in Britain up to the nineteenth century were mainly 'vernacular', architecture being associated with 'grand design', usually of monumental buildings. Both were essentially based on adaptation of precedent, and technical knowledge was usually embedded in practice with skills primarily learned 'on the job', although some forms of communication and dissemination were paper-based. Research, as the systematic development and transfer of knowledge, was largely implicit – in architecture this was individually produced by the 'gentleman architect'. Practice-based apprenticeship was reinforced in the latter part of the seventeenth century when this was promoted under Christopher Wren's influence in the Royal Works. Crinson and Lubbock (1994) argue that this emphasis on practice-based knowledge transfer was deliberate as Wren was well aware of the route promoted in France where architecture as a discipline began to be taught in the Academies. So, even when the British Academy was formed in the latter part of the eighteenth century, this institution had a limited role in architecture.

Pupillage

Practice-based pupillage was the most common form of architectural education by the early nineteenth century, associated with a growing distinction between the role of the architect and that of the builder/craftsman. This was partly an outcome of the effect of the Industrial Revolution on building production, with increasing manufacturing and labour specialisation undermining craft work in building, and the emergence of the general contractor, which threatened the position of architects. Both issues required a greater emphasis on prior building design and for this reason on contracts, specifications and drawings and the distancing of the architect from the building site. In addition to changes in building traditions and the architect's role in building production, the rise of, for example, surveyors and engineers threatened the architect's position and led to the concept of a protected profession. All these changes entailed a significant evolution of new forms of knowledge for

architects. However, training continued tied to pupillage throughout most of the century and the acquisition of knowledge was typically ad hoc in offices and through the European Tour, with a limited amount of college-based back-up, though library access was available and the paper-based transfer of information in book and drawing forms became more firmly established.

Training

Architectural training in the UK started to become university-based from the 1840s, when King's and University Colleges in London began to offer courses, though still seen as supporting pupillage, which were protected by the new professional institute. These Bentham-influenced colleges introduced basic conceptual distinctions between art and science, and architectural training was divided at this stage into aspects such as 'Fine Art' or 'Science'. However the growing influence of specialised architectural education did not go unopposed, with the Arts and Crafts Movement proposing an alternative to university college training and the inclusion of architecture in the syllabus of the Government Schools of Design, 21 of which were created from the late 1830s to 1852, drawing on French and German design teaching. Despite the increasing influence of college-based training, pupillage was predominant until the late nineteenth century, although by the early twentieth century some technical and art colleges had created architectural departments.⁹ This trend was then reinforced in the new system of polytechnics created under the influence of Fabian social democracy and modelled on the German crafts-based technical education system.

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A key event influencing college-based education was the RIBA International Conference of 1887 which highlighted the experience of the Ecole des Beaux Arts in France and its impact on American university-based architectural training. The main influence in the UK was the development of full-time courses in architecture, with a syllabus based on the new three-part professional examination system and, soon after, a system for 'recognition' of such courses by the RIBA for partial exam exemption. This led in turn to the need for uniformity in the syllabus, and RIBA Visiting Boards were established by 1923. By the 1930s architectural training had become predominantly college-based, with some practical training years and part-time, practice-based access to exams continuing to be available. This was largely due to the increasing specialisation of the architect's role, but also to the demands of an elite profession to control access through professional examinations (obligatory from 1882), the nature of which stressed technical competence as opposed to design skill. This college-based training took place, however, in four different forms of institution: universities, technical schools, art schools and independent professional schools.

So, throughout the period 1830-1930, there was an overall consolidation of professional status based on increasingly formalised training, with the debate on practical skills versus specialist learning largely being won by the institutions which provided the latter, as this was easier to examine and regulate. In all of this, however, architectural knowledge remained focused on precedent, at least for design, although new 'scientific' forms of knowledge were introduced. During this period the foundations of two distinct streams of college-based knowledge transfer were created, focusing respectively on the 'artist-architect' and the 'professional architect' and to some extent carrying on the Arts and Crafts versus academic/classical approaches. In this context, research generally remained implicit, although some explicit research into building construction began to emerge.

Beaux Arts and Bauhaus

Beaux Arts domination of the RIBA Education Board by the 1920s went hand in hand with the consolidation of state-sponsored regulation in architecture through college-based provision. This stressed academic learning as opposed to practice, although it had a strong element of studio work which continued to emphasise precedent in design. This reflected the trend across the professions towards full-time specialised college-based learning, and permitted a rapid growth in numbers to be trained, as well as the development of specialisations such as town planning. However, the dominance of the Beaux Arts approach was soon challenged by the Bauhaus tradition, particularly with the influx of Bauhaus teachers to Britain and the USA following the advent of National Socialism in Germany. While originally closer to Arts and Crafts in approach, the Bauhaus soon focused on industrial production, although its major influence in terms of knowledge was the challenge to 'tradition' and 'precedent' and the emphasis on individual creativity, self-discovery and problem-solving from first principles. It also adopted a strong 'scientific' approach to architectural design, advocating a strongly technologically determined approach with a social orientation.

The Modern Movement, as it was called, had radically different concepts of relevant knowledge for architecture and the way such knowledge could be acquired or transmitted. This included not only a physical and social science definition of relevant knowledge, but also a comprehensive approach to the production of the built environment, and an explicit approach to research and its links with education. In Britain, this was probably most clearly represented by the Architectural Association in London, but the inherent concepts of Modernism were soon reflected in the syllabuses of other architectural schools. The approach was closely associated to the postwar construction of the Welfare State and the emerging role of the architect in the reconstruction of a 'brave new world'. Increasingly the objective was not to train architects for individual or private practice, but for government

employment in the massive reconstruction and modernising state programmes in housing, education, health and so on. Part of this led to a reactivation of strong college-practice links with public architecture departments.

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Within this environment, research in architecture began to develop as an explicit undertaking, with examples of active research organisations and networks formed at around that time being the government's Building Research Station and the Modern Architectural Research Society (MARS).¹⁰ One of the MARS members, Percy Johnson-Marshall, was a key figure in the postwar lobby for the establishment of new university faculties for an integrated approach to 'environmental design', bringing together architects, planners, technologists and artists. This reflected the emerging role of the architect as manager as well as designer – and also the role of research and development within the discipline. In addition, it increasingly distinguished between 'services' and building science from architecture per se, with distinct courses developing in these areas.

University education

During the 1950s, architects with this Modernist approach eventually took over the RIBA Education Board, and the 1958 Oxford Conference organised by the Board is seen as another turning point for British architecture due to the recommendation that architecture be taught full-time in university or other higher education institutions with relatively high educational entry qualifications. Up to this point about one quarter of architect trainees followed this route with another two thirds studying at art and/or technical schools. What became known as the 'official system'¹¹ also promoted postgraduate research, although this was more likely to be seen as relevant in the physical and social science sides of the discipline (Martin, 1958). These recommendations took some time to have an impact,¹² but academic research in architecture did eventually emerge as an explicit activity and was seen as integral to the development of the broad knowledge base relevant for architecture, beyond historical analysis. However, as importantly, it was also embedded in the adoption of the de novo approach to problem-solving in practice and as such architecture became less about learning from the past via history and precedent, and more about applying modern rationality to problem-solving in conjunction with personal creativity.

Despite the aspirations of the visionary architects of the 'official system', in terms of raising the standards through university-based education, what happened was somewhat different. While the

proportion of architectural students who went through full-time higher education more or less doubled from 50 per cent to 100 per cent between the late 1950s and early 1980s, this was primarily due to radical restructuring of the university system rather than reorganisation of architectural training. A series of 'new universities' were created in the 1960s, based on previous colleges and, in the early 1990s what had been polytechnics became universities, with the retention of a few stand-alone art colleges that became dependent on universities for degree validation. So the 'official system' was adopted, in general, as a structure for architectural training and the breadth of knowledge deemed relevant for the architect was reinforced through the overview of education by the professional bodies (and later the government regulatory body). The nature of how this was put into practice in institutions differed somewhat, with the long-standing traditions of art, technology, built environment and social sciences/humanities being retained differentially across the range of higher education institutions. In fact most architecture schools continued to focus on teaching and did not place emphasis upon research as an explicit activity, although some older universities picked up architecture as a social science discipline, as well as an arts and humanities subject, and this was imbued to some extent with the wider traditions of university-based research.

Research Assessment Exercise

This situation has remained the general institutional context for architecture teaching and research until recently, when higher education restructuring led to more competition for funding, including research funding as an increasingly important stream of income. As well as through physical and social science oriented research councils, research funds were channelled through the Research Assessment Exercise, with little impact on architecture until the mid 1990s, when most university managers saw the need for accessing research funding streams across all areas of activity. In the RAE 1992, only 24 of the 36 architectural schools were in institutions making submissions to Units of Assessment Built Environment (UoA 35), History of Art, Architecture and Design (UoA 63) and Art and Design (UoA 67) – 19 of these also submitting under Unit of Assessment Town and Country Planning (UoA 36). It is not possible, from the publicly available information, to know which architecture schools submitted in each of these units, but it is possible to see some trends in the subsequent assessment in 1996.

As well as an increase in the number of schools submitting in 1996 (35 of 36) – these also submitted to a larger number of Units of Assessment – the number of submissions overall rose from 42 (16 in Built Environment, 13 in History and 13 in Art & Design) to 46 (22 in Built Environment, 11 in History and 13 in Art & Design). In 2001 this dropped to 27 submissions (14 in Built Environment, 8 in History and 5 in Art & Design). This illustrates a tendency for research in architecture schools to increase in breadth (in RAE terms) in the 1990s, but for that trend

to reverse by the end of the decade. This seems to be in response to the results of previous assessment – as the 1996 results are often lower than those of 1992 and 2001 – in other words there has been a recent trend to depth over breadth in submissions (see next section). When the progression in results is examined by institution there is evidence of a tendency for old universities to do better, but this tendency is gradually decreasing as some post 1960 universities are now getting better results.³³ Post 1992 universities and art colleges have generally lower results, but some have improved their levels, although not reaching – with a few exceptions – the top rankings.

These trends are borne out by the interviews with key staff members in the study, and point to the difficulties in competing in such assessment from a 'standing start', with fairly recent participation in these processes of assessment being compounded by the competing calls research has on time and – often limited – resources. This is leading most institutions to specialise in their submissions, and some even to consider dropping out altogether from competition for research resources through the assessment mechanism. The overall effect is less evidence of breadth in research, more specialisation, and less evidence of research and teaching links. The recent study suggests that, not only is this considered to be bad for the profession overall, but – as outlined above – this is effectively the result of the historical development of the institutional base, and the organisational and conceptual 'streams' that this has promoted, especially since the late 1950s.

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This institutional base has evolved differently in other countries as Stevens (1998) describes. The way in which architects in the UK are currently trained, within institutions that conduct systematic research and scholarship in a variety of intellectual areas, is a synthesis of educational systems from various countries (see Stevens, 1998: 173-186). As has been noted above, the idea of organised formal architectural education comes from France where the state has, historically, taken on an important role in producing elite professionals including architects. Here the architectural section of the Académie des Beaux Arts exercised strong control over its intellectual production. The École des Beaux Arts, and even the *grandes écoles* today, did not have research as a primary activity, research tending to be conducted in provincial universities (focusing on applied research) or in separate research institutions unconnected to HEIs. From Germany comes the concept that there should be a link between teaching and research, which takes place in universities, with the concomitant idea of the researcher working also as a teacher, prompting scholarly activity to move into universities. However, architecture in Germany

was taught at polytechnics or arts and crafts schools, which were not research-oriented. In the USA, there was a synthesis of the above two systems with the apprenticeship model inherited from Britain – professional education being dominated by the university rather than by the state or by practice. American universities were originally based on the Oxbridge model or were of the vocational type. They imported the German research-oriented model in the late nineteenth century, bringing applied research into the university, but using a more egalitarian structure of independent academics rather than the autocratic German chair-institute model.

So, in drawing on a variety of organisational structures and mental models from abroad, and combining these with the British apprenticeship model, the formalisation of UK academic architectural training has given rise to the contemporary existence of a range of higher education contexts for research in the UK schools of architecture. These will be explored in the following section.

2. The research findings and recommendations

The research project on the institutional basis for research in architectural schools in the UK was initiated by the School of Architecture at Edinburgh College of Art (eca) in March 2004 and completed in September 2004. It was undertaken in five phases that are described in Jenkins, Forsyth and Smith (2004).¹⁴ The data suggests that UK schools of architecture tend to be predominantly located within post 1992 universities. They are mainly oriented in their focus either towards visual arts or the built environment, with a few having a social sciences/humanities focus. They have come into more direct contact with other disciplines due to major institutional changes in the general HEI sector, although this has not necessarily promoted cross-disciplinarity in research per se, but has brought pressure to bear on schools to achieve research recognition for funding. They are also relatively limited overall in the breadth of their architectural research, though less so in their depth; there is a significantly higher likelihood of both breadth and depth in schools located in old and post 1960s universities. They have demonstrated a fairly ‘polarised’ form of submission in the 2001 RAE, with most schools submitting under one Unit of Assessment only. Generally they have had a low rate of success in achieving high ratings in the last RAE, this success being more concentrated in schools located in post 1960s and old universities (for in-depth empirical basis for these findings, see the report).

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Analysis of the interviews demonstrated a general agreement that architecture is essentially cross-disciplinary in practice and that this is reflected in

education and professional standards.¹⁵ Architecture is also essentially cross-disciplinary in research, but this is not promoted by the current assessment process in higher education institutions, which tends to reward disciplinary depth. In addition, key areas of architecture which are seen as fundamental to education and practice development – design and practice – have weakly defined assessment criteria in academic terms. Research into specific disciplinary areas within architecture in HEIs seems to be increasing in quantity and quality, although architecture is a fairly recent university-based discipline, and the academic research environment tends to promote further specialisation. However, the profession has lost some of its previous key role in coordinating the production of the built environment, a trend that seems to be partially attributed to this more narrow focus in research as opposed to more cross-disciplinary ‘problem-solving’ research, which is seen to require a more holistic approach. In addition, other actors in the construction process have advanced faster and in more diverse ways than architecture. So, growing specialisation in research (depth), and limited support for the cross-disciplinary practice-oriented aspects of the subject in general (breadth), can arguably lead to declining excellence in essential cross-disciplinarity in architecture over time (length).

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The institutional context of architectural research in higher educational institutions (HEIs) has been changing rapidly, with reference to both research funding and implementation. Much institutional change at the university level would appear to be conducive to more inter-disciplinarity in architectural research but, both the evolving focused funding structure at national level and the practical difficulties of inter-disciplinary working within restructured universities and faculties, tend to hinder more holistic approaches to the subject. Therefore, although new institutional arrangements have promoted higher quantities and qualities of research within the various specific or sub-disciplines, these seem to have led to an overall limitation in the nature and quality of endeavour in architectural research in more holistic terms.

The study suggests there is a basis to the claim that a more holistic institutional context needs to be deliberately promoted to ensure broader development of research in the subject area to ensure longer-term innovation and excellence. This ‘holistic’ institutional context needs above all a consolidated conceptual framework for architecture research, within and without academia. It also implies some consolidation in terms of organisational structure. The 1958 Oxford Conference not only argued for exclusively university level education for architects but also architectural

research linked to this and expanding the knowledge base of the profession (Martin, 1958), and this led to a new focus on physical and social science research, beyond the previously dominant historical focus, largely represented by the two strands of research subsequently developed by Richard Llewelyn Davies at UCL (focused on building science) and Leslie Martin at Cambridge (more focused on social science).¹⁶ However, these traditions of embedding research into teaching did not go far beyond these two areas, and did not penetrate most of the new architectural schools/departments – particularly in post 1992 universities and art colleges. So what is needed still is a recognition of different institutional contexts for architecture in higher education and their value in promoting different forms of research within the overall concept of architecture knowledge advancement.

‘So what is needed still is a recognition of different institutional contexts for architecture in higher education...’

As well as clearer conceptualisation and ‘positioning’ of different organisations within different institutional contexts, there is arguably also a need for better forms of coordination and collaboration across the field of architecture research, and a means to ensure that different areas do not become (or remain) relatively under-developed. This overview of architecture research is as much an issue for professional bodies, industrial partners, and overall higher education funding bodies, as for the architecture schools.

The UK-wide research interviewees proposed a wider range of recommendations, which are summarised as follows:

1. Forums should be created where UK schools of architecture can debate and seek ways forward on fundamental issues that will affect the future development of architectural research, especially the conceptualisation of architectural research, with the definition of design-based and practice-led research and criteria for peer review and assessment. This, in fact, has begun to happen – the study itself led to the creation of a National Reference Group for Architecture Research with participation across the range of architecture and related schools/departments, and several other research symposia are planned at the time of writing.
2. A regular architectural research conference also involving the profession, industry and government – as happens in other professionally-related disciplines – needs to be organised to promote debate, not only around the above fundamental issues, but also around ideas within architectural research, on a regular basis. The study has led to the hosting of the forthcoming UK national architecture research conference, ‘Architecture Research Futures’, to be held in Edinburgh in mid December 2005.¹⁷
3. Schools of architecture should follow the example of other subject areas that have recently raised their research profiles by developing a coherent and collaborative approach to lobbying around research, together with professional bodies and industry. This was undertaken in the period prior to the forming of the new RAE Units of Assessment, with significant effect, as the following point illustrates.
4. Government research assessment and funding bodies need to recognise both the breadth that characterises architecture and its diversity – in research traditions within it and in the strengths of individual schools. Such recognition should provide mechanisms that facilitate the development of cross-disciplinary research, as well as options that facilitate collaboration rather than competition between schools, and between schools and the profession and industry. This has been supported in Scotland through the Scottish Higher Education Funding Council funding of a one-year Strategic Research Development Grant focusing on the feasibility of institutional collaboration across the relevant HEIs on architecture research – entitled ScotMARK. It has also been implicitly accepted in the restructuring of the RAE 2008 Units of Assessment (with Architecture now explicitly named and many more academics from architectural schools sitting on sub-panels) as well as the relevant criteria and assessment mechanisms currently out for public comment.
5. Links between the profession, industry, and architectural research conducted in HEIs, should be explored by all three groups, looking beyond the scope of current Continuing Professional Development and non-academic conference initiatives, towards more interactive and reciprocal forms of ‘knowledge transfer’ and joint working. ScotMARK has been active in this in Scotland, supported by the RIAS and Scottish Executive Architecture Policy Unit, which also supports the new Architecture + Design Scotland, that will operate in a similar way to the Commission for Architecture and the Built Environment (CABE). The New Construction Research and Innovation Strategy Panel nCRISP serves this function for industry.
6. University, faculty and school level decision-makers need to put in place appropriate teaching and research evaluation mechanisms which will address the growing tensions in how teaching, research and administration demands affect the profile of academic staff in architecture schools. It is part of ScotMARK’s brief to undertake this in the Scottish context. This could be extended to a UK wide review.
7. HEIs need to learn from each other’s strategies to encourage and support individual interest and motivation among researchers, which are key to achieving quality and quantity in research.
8. More research should be conducted into pedagogy and its links to both research and practice; and opportunities should be created for debate around, and dissemination of, such research.

The above findings and the logic behind the subsequent recommendations are, however, not simply recent developments, but – as argued in this paper – in fact the result of the long historical institutional evolution described in the previous section.

3. How architecture research might evolve

Not only has the study highlighted the fact that it is time for a concerted effort to raise the profile of architecture research in the existing national research assessment process (while arguing, where appropriate, for more fundamental changes in the process itself), but also that there is a need to reflect on what architecture research should be, in a wider sense, and how this should develop in line with the trends in professional practice. This last section of the paper begins to address these issues.

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The results of the study illustrate that depth within some areas of the discipline is strong within many institutions. This is most common within the areas of history, theory and building science, representing a continuation of the strand of individual scholarship traditional in these areas. Strength in depth in these areas is important to the schools which have it, as it capitalises on the interests of specific members of staff, subsequently serving them well in terms of the RAE. For this reason such forms of research will tend to continue to exist and be supported by institutions.

In contrast to this depth in research, the breadth of learning and teaching in architecture has had to respond to the criteria imposed by the professional body, the Architects Registration Board (ARB), in September 2003. Each prescribed school/department must now cover the breadth of the discipline of architecture as defined by the ARB in its syllabus. However, this breadth of teaching and learning is not represented in terms of staff research, since schools are no longer able to maintain a staff complement which includes a wide range of specialists. Specialist teaching tends to be bought in as required or shared among institutions. Consequently, the breadth demanded for teaching is available to very few institutions in research.

In addition to the issue of depth and breadth within and across institutions, it is relevant to consider the influence of the type of institution on the ability of architecture schools to carry out research. The results of the investigation illustrate that 15 of the 36 architecture schools/departments have either not taken part in the RAE (3 schools) or have achieved very low results (12 scoring RAE grade 3 or below).⁴⁸ These tend to be from institutions which have been established post 1992 (11 of the 15). In addition, a number of schools, in response to institutional pressure, have tended to associate

themselves with other, stronger, research directions within the same institution rather than developing a distinctive architectural research profile of their own. In the last RAE this was most obvious in existing or former art colleges where Architecture was submitted with Art and Design and benefited from that institutional strategic decision. However, the research which these schools carried out was subsumed within the overall submission of an art and design institution and, as such, it is impossible to extract the contribution which architecture made to these submissions.

The paradox between broad based teaching and learning and ever more specialised research has been pointed out by the Standing Conference of Heads of Schools of Architecture (SCHOSA) and begins to be addressed in the aims of the Delft Declaration. The argument is that generalism, through the coverage of all criteria by all students in all higher education institutions, is neither desirable nor possible. Professional practice is becoming increasingly diverse and specialised, a fact that is recognised by the Delft Declaration which suggests that it should be reflected in architectural education. If schools were allowed to develop their own, individual, directions then a situation similar to the one that has developed in the USA over the last twenty years (as described by Anthony Vidler in Chadwick, 2004) might arise. At Princeton, for example, architecture is seen as one of the foundational humanities. At MIT it represents the intersection of all the scientific and humanistic disciplines. At Columbia its programmes are shaped by emerging digital technologies, while at Penn the architecture school exhibits an emphasis on the hermeneutic and anthropological.

If this approach is to be adopted, individual schools would provide depth in their respective teaching specialisms, while the breadth of architecture might be represented by cross-institutional collaboration. Such a development would also allow research to follow a similar pattern with schools developing specific areas in depth, and groupings of schools, whether geographic or generic, could provide the breadth necessary to ensure the evolution of the discipline. In establishing specialisms, the teaching and research focus of the school would tend to evolve within the parameters of the actual higher educational institutional context and this would largely define the strategic direction which architecture in that institution is likely to follow in terms of learning and teaching as well as research.

‘The role of the professional associations and the construction industry remains unclear in relation to research.’

The above is a response to academic restructuring pressures, however the role of the professional associations and the construction industry remains unclear in relation to research. It appears that, apart from isolated examples, there is very little support

from industry. What support there is appears uncoordinated with no obvious opportunity for brokering or coordinating through some intermediary institution. The RIBA is attempting to establish itself as a broker or agent in bringing together interests in research but, to date, this initiative remains embryonic. The Research and Development Committee of the Royal Incorporation of Architects in Scotland (RIAS) has also not yet developed this vital role to any extent. The professions have been extremely slow in their support for research: the RIBA and RIAS having only established their Research and Development Department/Committee recently, despite the fact that the pressures on architecture schools to produce research for the RAE has been evident since at least the RAE 1996. The profession's tardy response has, arguably, contributed to the problems faced in RAE 2001. As noted in the above section, recent initiatives in Scotland, growing out of the baseline research reported here, are aimed at tackling some of these issues, and have professional institution backing.

Other major issues identified in the study as contentious within current definitions of academic research – the role of design as research and the built form as research product – remain unresolved. The recent debate about the Cambridge School of Architecture conducted in the popular and academic press encapsulates the opposing sides in this discussion. The architecture 'heavyweights' suggest that the RAE, as a process, is unfair to architecture and that architectural design constitutes relevant research, while contending that research in other

areas, such as the physical and social sciences, is less relevant because it is narrowly defined and detailed. Whether these issues are relevant to the debate about the Cambridge School is unclear, but the polarisation of views provides a telling reflection of the opinions revealed in the study described above – and reminiscent of the post RAE 2001 debate in *arq* summarised in the introduction to this paper.

This range of views is further emphasised in the 'Back to School' edition of *Architectural Design* (2004). Here views on architectural education were presented which reveal not only a diversity of opinion, but also confusion regarding concepts of research. This illustrates clearly a need for a more focused debate on how research in architecture is conceptualised – whether academic, practice-based, or other – and how the discipline itself can put forward criteria for peer review of this. The debate should take into consideration the arguments articulated in this paper – that institutional organisational structures matter and, to a great extent, condition and are influenced by conceptual models. Therefore appropriate institutions are fundamental to restructuring concepts and organisational structures as a means for promoting the importance of architecture research. It is hoped that the national conference 'Architecture Research Futures' in December 2005 will provide the opportunity for the academic and practice peer groups to come together, discuss and arrive at some resolution of these issues. If this is achieved, architectural research may once again have reached a significant point in its conceptual development.

Notes

1. University of Sheffield (Lawson, 2002), University of Bath (Tavernor, 2002), Mackintosh School of Architecture (Porter, 2002), North London University (Beigel and Christou, 2002), University of Portsmouth (Stansfield Smith, 2002), University of Sheffield (Worthington, 2002), as well as the RIBA (Jones, 2002) and others (Muirhead, 2002).
2. The debate has started up again in various ways, including in the architecture press (for example Rendell, 2004) and through the National Reference Groups on Architecture Research hosted in Edinburgh (October 2004, April and July 2005), as well as new seminars hosted by the RIBA (September, October 2005). As this paper draws on research undertaken before these were in the public domain it does not comment on these.
3. A fuller discussion of forms of valid research in architecture is developed in Jenkins, Forsyth and Smith (forthcoming 2006).
4. It can be argued that this is influenced by scientific definitions

of research, which themselves are sometimes seen to be dominated by physical science (eg, Flyvbjerg, 2001). This emphasises textual reporting of research activity as opposed to other forms of representation, including expression through the results of practice. Essentially this formal definition of research separates the practice of academic research from the dissemination of the results, the latter being predominantly expressed in text form. Although most academic research entails some form of practice, research in the visual and performance arts has particular difficulty with this representation in text form, and architecture is partly affected by this. Architecture involves aspects of physical and social science as well as the arts and humanities, and the result of its practice is built form, and representations of this. This paper will argue that while it is accepted there is a need for clear definitions of what is valid academic research, especially to access funding, the relationship between research concerning

architecture in higher education institutions and research in, and through, practice in architecture needs better articulation.

5. While this forms at least part of the *raison d'être* for the academic definition, the nature of HEI disciplinary and government sectoral divisions, as well as the instrumentality of the objective for the definition, mean that such a definition is inevitably narrower. Although the recent study into research in UK architecture schools has raised issues concerning the narrower instrumental definition of research, which is important for academic institutions at this time of national research assessment, this paper aspires also to examine architecture research in the light of a wider definition. To achieve this it uses an institutional perspective over time, arguing that a longer term perspective can guide shorter term action in a strategic way.
6. These traditions have emerged in the fields of economics through 'new institutional economics' (eg, Eggertsson, 1990) and political science, through three separate

- strands: historical institutionalism, rational choice institutionalism and sociological institutionalism (Hall and Taylor, 1996). The conceptual frameworks developed in these traditions have been applied to other areas such as development studies (eg, Harriss, Hunter and Lewis, 1995) and urban studies (Healey, 1995; Mingione, 1995). Although these approaches have different origins and subject areas, they all deal with two fundamental issues: 'how to construe the relationship between institutions and behaviour and how to explain the process whereby institutions originate or change' (Hall and Taylor, 1996: 937). For more information, see, for instance, Jenkins and Smith, 2001.
7. By profession here we mean the body of practising architects, not only the professional associations.
 8. An additional source, referred to by an anonymous referee of this paper in draft form, is Maxwell (2004), which also draws on Crinson and Lubbock.
 9. The Architectural Association in London offered design classes from the late 1860s.
 10. The Building Research Station collaborated with designers, manufacturers and others in development of prefabricated system buildings, and MARS developed social science research including visionary plans and exhibitions before disbanding in 1957.
 11. The 'official system' proposed 3 years academic training followed by 1 year practical and then 2 years academic training and a final practical year, so retaining elements of practice.
 12. Although the Bartlett and Cambridge schools began implementing these almost immediately, closely followed by Bristol, Edinburgh and Liverpool universities.
 13. Perhaps the older universities are fighting back; of the 11 members of the RAE Unit of Assessment 30 (Architecture and the Built Environment) with an explicit architectural focus, 7 are based in old universities, with only 1 in a post 1960s university, 2 in post 1992 universities and 1 in an art college, compared with 7 schools/departments in old universities, 6 in post 1960s universities, 18 in post 1992 universities and 5 art colleges across the country.
 14. The five main phases were:
 - initial collection of publicly available data and analysis based on individual datasheets, using architecture school and the HERO websites and some other relevant reports;
 - remittance of data summaries to all schools for checking and additional information, with one page summaries to accompany the datasheets in a 'compendium' of information (including research);
 - analysis of the data by key criteria (nature of institution and nature of evidence of research), permitting an overview and selection of a typical sample (12 schools of the 36 ARB-recognised UK-wide, although a school dropped out at the last minute, rendering the sample 30 per cent);
 - in-depth semi-structured interviews with key representatives of the sampled schools and analysis based on the main research questions;
 - discussion of the research process with a project Steering Group of relevant Edinburgh-based institutions (Edinburgh College of Art, University of Edinburgh, Heriot-Watt University and the Royal Incorporation of Architects in Scotland), discussion of draft findings with a National Reference Group made up of invited representatives from 16 architecture schools, the professional associations RIAS and RIBA, and government departments (Scottish Higher Education Funding Council and the Scottish Executive Architecture Policy Unit), and wide publication and dissemination of the report.
 15. Cross-disciplinarity is defined in the research as habitual interdisciplinary activity.
 16. The authors are grateful to an anonymous referee for drawing their attention to these differences post 1958 in Robert Maxwell's preface to Hawkes (1996).
 17. See: <http://www.archresearchconf.com>.
 18. This excludes schools/departments which have only submitted in RAE Unit of Assessment 34 (Town and Country Planning). RAE grades 3 and below generally have not been funded (some graded 3a have received funding, however).
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Biographies

Dr Paul Jenkins is Director of the Centre for Environment and Human Settlements in the School of the Built Environment, Heriot-Watt University, Edinburgh, Scotland, from where he is seconded as a Senior Associate Research Fellow at Edinburgh College of Art. An architect by training, he has worked during the past 30 years in a wide range of positions on policy, practice, training and research in

architecture, urban planning, housing and construction.

Leslie Forsyth is an architect, town planner and urban designer. He is Head of the School of Architecture at Edinburgh College of Art and is the Programme Coordinator and major contributor to the Diploma/Masters in Urban Design at eca. He has practised and taught in Edinburgh, London, Liverpool, Lisbon and Aachen. His main research interests are spatial structure and urban design education.

Dr Harry Smith is a Lecturer at the School of the Built Environment and linked to the Centre for Environment and Human Settlements. A registered architect and trained planner, he has worked in architectural practice in Spain and the UK, and has been involved in architectural, planning and housing teaching and research in Europe, Latin America and Africa.

Author's address

Leslie Forsyth
School of Architecture
Edinburgh College of Art
79 Grassmarket
Edinburgh EH1 2HU
UK
w.forsyth@eca.ac.uk

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