C·SCAIPE

The Higher Education Academy

CEBE Centre for Education in the Built Environment

Deconstructing the Stereotypes

Building Mutual Respect

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Contents

Executive Summary

This report presents the findings of a pilot study exploring the nature and origins of the commonly held perceptions and stereotypes amongst built environment students and graduates of each other's disciplines.

Interdisciplinarity continues to rise up the agenda in both an educational and practice context across many disciplines, but perhaps more so within the built environment. Long standing notions of a divisive and adversarial industry, characterised by fragmented and insular professions (see for example Latham, 2004) have long prompted calls for greater collaboration and cross-professional interaction. However, this ambition still faces major barriers, not least in the form of the entrenched stereotypes which exist between the various professions. What is perhaps even more worrying is that, despite widespread realisation of the importance of interdisciplinarity, a recent paper by Edwards et al (2009) highlighted that many built environment graduates still emerge from university without sufficient appreciation of the role of other disciplines and worse, with ill-conceived perceptions of other disciplines.

With this in mind, the need for future professionals to be equipped with the necessary skills and understanding of other key actors is essential. In this respect, Higher education (HE) has also been identified as having a central role to play in promoting *'the view that students of related disciplines benefit from working and learning together and that collaborative working is a positive and important component'* (Collier et al, 1991). This central role is echoed through the Subject Benchmark Statement for Construction, Property & Surveying (QAA, 2008) which highlights *'the ability to work effectively with others within the context of a multidisciplinary team respecting the respective inputs from fellow professionals, client(s), and other stakeholders'* as an essential element of the skill set.

Within this context, pioneering initiatives such as C-SCAIPE at Kingston University typify a commitment to putting interdisciplinarity at the heart of built environment education moving forward. However, whilst research has been undertaken to understand stereotyping within practice, little has been done to develop a knowledge of just whether and to what extent students already have views about roles and relationships between differing types of built environment professionals. However, as Hunt *et al* (2004) suggest, without an understanding of the nature and source of students perceptions, we cannot begin to design effective means of combating such issues.

Therefore, through a combination of a detailed literature review and structure online survey, the study seeks to establish the extent of interdisciplinary attitudes within built environment students at Kingston University, whilst building a picture of not only the stereotypes held amongst and between disciplines, but also the fundamental root of such perceptions.

The pilot study importantly finds that students, by and large, recognise the impor-

tance of cross-disciplinary relationships and interactions between theirs and other professions. Even more encouragingly, as student progress through their undergraduate degree, this perceived importance increases, suggest that the learning experience positively promotes and facilitates interdisciplinary working. In addition to this, notions of professional superiority; which are seen as a potential inhibitor to effective collaboration, were not evidenced in the majority of students. That said, architecture students still ranked their profession as the single most important within the built environment.

The study paints a variable picture with regards to likeability, with some professions demonstrating a high level of mutual respect and other where deeply negative personality perceptions are likely to hinder interdisciplinary working. Furthermore, it becomes clear that commonly portrayed stereotypes have strongly permeated the beliefs of students, with a great deal of resonance between, as an example, the view of Quantity Surveyors as a *"boring brick counter"* and students high rankings for the personality traits of 'Boring' and 'Technical'. Worryingly however, the findings indicate that, in some cases, negative stereotypes actually became much stronger and likeability consequently falling as students progress on undergraduate degrees.

The findings also identify work colleagues as the most significant source of stereotypes amongst students, closely followed by electronic media. From these results, it also becomes clear that course lecturers are not so much a source of stereotypes, but tend to play a confirmatory role, reinforcing those which students already hold. Interestingly, despite recognition within the literature of the major role that the school environment can play, students perceived little influence from this source, suggesting a currently missed opportunity for early action in challenging stereotypes.

From these findings, the report presents a number of recommendations in order to progressing the debate and practice on stereotyping and interdisciplinary within built environment education:

- A wider roll out of this pilot study across universities nationally in order to verify and expand these early findings

- Greater interaction and links between HEIs and schools to capitalise on pre-HE learning experiences

- Build on the successes of characters such as *Bob the Builder* to promote positive perceptions of other disciplines within the BE

- Tackle the issue of stereotyping and interdisciplinarity at the early stages of both undergraduate and postgraduate programmes

- Explore ways to develop greater parity in the education models amongst built environment disciplines

Introduction

Interdisciplinarity and effective collaborative working are seen as important educational and practice ambitions within many disciplines, but perhaps nowhere more than in the built environment. A desire to break down the traditional view of a 'divisive' industry (see for example Ball, 1988) can be traced back through seminal reports. One such report, by Sir Michael Latham (1994) highlighted this adversarial nature as a major inhibitor to efficiency and encapsulated one of the first calls for greater collaboration. Recently, the focus on an interdisciplinary approach and the associated skills has gathered renewed vigour, catalysed by the push towards sustainable communities. Egan (2004), in his review of Skills for Sustainable Communities, highlighted the need for '*the establishment of cross-cutting teams*' voicing concerns that many professionals had not realised '*that they had anything to do with each other*'.

One of the most significant threats to the ambition of interdisciplinary working is occupational and professional stereotyping. Traditional views of '*architects wanting to do something flowery, engineers getting anal about numbers and developers just being after a quick buck*' (Tom Randall reported in Smethurst, 2008) remain deep-seated and are recognised as '*a contributory factor in the relatively high level of conflict that characterises the...industry*' (Munns, 1996). These negative perceptions, coupled with generally limited understanding of the constraints and contexts which shape the role of other built environment professions, act as effective barriers to the development of mutual respect and collaborative working. Without effective team working, the necessary changes in building design, construction and management to support social cohesion and environment protection, will be stifled.

Essential in resolving such issues is the need for existing and future professionals to be equipped with the skills and understanding necessary to function effectively in interdisciplinary teams. Higher Education (HE) is identified as having a central role in harnessing '*the view that students of related disciplines benefit from working and learning together*' *(*Collier *et al,* 1991) with associated skills beginning to feed through into Subject Benchmark Statements. Furthermore, initiatives such as C-SCAIPE at Kingston University typify a commitment to imbuing collaborative behaviours. However, despite such efforts, a recent paper by Edwards *et al* (2009) highlighted that many built environment graduates '*leave university without a sufficient understanding of the diverse actors*' and worse, with embedded stereotypes. One reason for this lack of success is the limited knowledge held by Higher Education Institutions (HEIs) of the extent to which, for example, the stereotype of the Quantity Surveyor as a boring brick counter is already in the mind of an aspiring architect and just how, and from where, these stereotypes transpire. As Hunt *et al* (2004) recognise: '*this step is essential, one must identify how negative perceptions arise to determine how to combat them effectively.*

Research Aims

The aim of the study is to unpack, through a literature review and pilot study, the nature and origins of the commonly held perceptions and stereotypes amongst built environment students and graduates of each other's disciplines. The study also aims to develop an understanding of the possible steps, particularly within teaching and learning, which could be adopted in order to eradicate these inhibitive perceptions and equip students and graduates with the appreciation and skills required to enable effective interdisciplinary working.

The study is aimed at being the foundation for Higher Education Institutions (HEIs) to begin addressing the lack of interdisciplinary understanding amongst graduates of different disciplines, as well as shaping school careers advice and the early recruitment literature provided by professional institutes (such as RIBA, RICS and the RTPI) in order to contribute to a better equipped and more collaborative built environment workforce moving forward.

The research is framed around several key questions and objectives:

- What is the nature of the stereotypes held by students and graduates?

- What is the initial source of these perceptions?

- How and why do these perceptions change as students progress through their chosen courses?

- In what way do curriculum content and teaching/learning strategies endorse or deconstruct these stereotypes?

Research Design

The project involved a three-stage methodology including:

Stage 1: Literature Review

Stage 2: Online Pilot Survey of Kingston University Built Environment Students

Literature Review

The study is underpinned by a detailed review of literature pertaining to stereotyping within the built environment industry. The rationale for the research emanated from the identified void in understanding of the origins of stereotyped impressions held by built environment students. Thus, the search was widened to include selected areas of tangential literature in order to unpack the origin and development of stereotypes and perceptions. These areas include general literature related to occupational stereotyping and also literature pertaining to influences on student career and further education choices, much of which is transferrable into stereotyping.

The review also incorporates a brief content examination of media projected images, namely Bob the Builder, and a review of teaching materials across a range of built environment programmes at Kingston University, in order to gauge their impact in perpetuating or breaking down stereotypes. The findings of the literature review were used to inform the development and content of the online questionnaire (stage 2) and subsequent discussion groups (stage 3).

Online Pilot Survey

Distribution

The online survey was distributed to Kingston University students as an initial, but relatively sizeable, pilot study. It is envisaged that the methodology could; and indeed should, be applied more widely to students at other universities to verify and extent findings. This is particularly so because, although Kingston students may be typical of the student population, the work of specialist centres at the University; such as C-SCAIPE, in the promotion of interdisciplinarity, in theory suggests that such a sample may exhibit a stronger breaking down of professional hostilities.

A stratified sampling method was employed using two strata. Firstly, a number of built environment courses were selected (see box below), representing a cross-section of architecture, surveying, planning and construction. Within each course strata, the population was broken down into subsets depending upon level of study. From within this, three levels were chosen, covering students in their first year (level 3) to those in final year (level 6) and postgraduate (level 7) allowing the research to assess how perceptions and stereotypes changed throughout the higher education system. This system was adjusted accordingly to reflect the complex vocational structure of architectural education.

Selected Courses

Architecture

BA (Hons) Architecture

Architecture Graduate Diploma

Construction

BSc Construction Management

MSc Construction Management & Construction Law

MSc Management in Construction

Surveying & Planning

BSc (Hons) Quantity Surveying Consultancy

MSc Quantity Surveying

BSc (Hons) Real Estate Management

MSc Real Estate

BSc (Hons) Property Planning & Development

MA Planning & Sustainability

To put these courses into their context, both the School of Architecture and School of Surveying & Planning are contained within the Faculty of Art, Design & Architecture, whilst Construction courses fall within the Faculty of Engineering.

Physically, Construction and Surveying & Planning are located within one campus, whilst Architecture courses are housed in a separate nearby campus. Students from Surveying & Planning and Construction share a single Academic Skills Centre (CASC), which is manned by students and staff from both departments.

The survey was developed using the online questionnaire tool, Survey Monkey, and distributed via email to students on the selected courses. The data was subsequently coded for analysis in PASW.

Survey Composition

The survey was designed to investigate students perceptions of the roles of, and relationships between, the various built environment professions. With reference to the relationships between the professions, the survey seeks to develop inter-professional personality profiles to examine where the strongest tensions exist.

The survey consisted of three main sections:

The first consisted of multiple choice, demographic questions to identify in general terms the circumstances of the respondent, with particular regards to professional route, study level and industry experience.

The second section was designed to elicit both generalities regarding the perceptions held along with building professional personality trait profiles. This section of the survey seeks to build on and refine the methodology of Loosemore and Chin Chin (2000) by using a personality trait ranking system to develop professional personality profiles. Respondents were offered preconceived lists of both positive and negative behavioural/personality traits derived and adapted from the work of Anderson (1968). The traits were selected for both their relevance to interdisciplinary working and also to draw out some of the commonly cited stereotypes in literature. The survey asked respondents to rank how the various characteristics match their perception of each built environment profession, including their own. From this, a like-ability profile could be developed amongst and between the various professional groups.

The final section of the survey provided examination of the key sources of students pre-education stereotypes and an understanding of how these had changed as a result of progression through their chosen degree programme. Cross tabulation of various other questions against level of study built a more detailed picture of the influence higher education has on stereotypes and interdisciplinary attitudes.

Literature Review

Interdisciplinarity and effective collaborative working is seen as an important educational and practice ambition agenda within the built environment. However, concerns about a lack of collaboration in the built environment are not new and calls for greater interdisciplinarity can be traced back through many of the seminal texts below. Most recognise that current deficiencies in inter-professional understanding stem from the deep rooted characterisation of the built environment industry as fragmented, reliant upon diverse actors and a complex network of professional and institutional relationships. As a result, the built environment industry in the UK is traditionally viewed as divisive (see for example Ball, 1988 & Woudhuysen *et al*, 2004). The Latham Report (1994), relating to construction specifically, highlighted this adversarial nature as a major inhibitor to efficiency and competitiveness and encapsulated the first calls for greater collaboration and an interdisciplinary approach within the built environment. Most recently, as a result of the governmental drive towards sustainable communities, the need for connections between professions and the *'establishment of integrated cross-cutting teams'* has become even more prevalent (Egan, 2004). In his report Egan particularly noted that many professionals had not realised in *'that they had anything to do with each other'*. This position echoed that of CABE (2003) whose publication *Building Sustainable Communities,* which encouraged *'disposing of historic professional silos and developing a common understanding'*. Occupational and professional stereotypes are regularly recognised as *'a contributory factor in the relatively high level of conflict that characterises the construction industry'* (Munns, 1996) with the long-standing demarcation between the architect and the builder epitomising the division of the industry. However, in addition to this, these negative stereotypes are also held to have an effect on non-cognate perceptions with repercussions for *'attracting high quality people'* (Moore, 2001) to built environment professions. This raises the question as to whether perceptions lead to a self-fulfilment in reality.

With strong recognition of a major, unresolved problem and with interdisciplinarity high on the agenda within the built environment, the need for existing and future professionals to be equipped with the necessary skills and understanding of other key actors is essential. Whilst progress is, arguably, occurring in some fields of practice through the increase in multi-disciplinary practices, higher education (HE) has also been identified as having a central role to play in promoting *'the view that students of related disciplines benefit from working and learning together and that collaborative working is a positive and important component'* (Collier *et al,* 1991). The Subject Benchmark Statement for Construction, Property & Surveying (QAA, 2008) includes as specific and generic skills *'the ability to work effectively with others within the context of a multidisciplinary team respecting*

the respective inputs from fellow professionals, client(s), and other stakeholders'. However, Moore (2001) suggested that despite recognition from academics and practitioners of the existence of negative stereotypes, '*little evidence exists of the UK industry's reaction to this situation.*' This perceived lack of action has given rise to initiatives such as C-SCAIPE at Kingston University which typify a newfound commitment to instilling collaborative behaviours and encouraging interdisciplinary working and understanding between built environment students.

In light of the recognition of the important role Higher Education has to play in improving interdisciplinary within the built environment education, a number of authors have turned their attentions to the various teaching and learning interventions that could be used to move the agenda forward. Chapman (2009) underlines the significance of '*devising approaches that enable built environment students to...make connections between their own disciplinary interest and others'* and the potential for this to '*provide a basis for greater synergy between disciplines...in practice'*. However, Webster (2008) remains more pragmatic, believing that there is more scope for manoeuvrability at the fringes rather than wholesale curriculum change.

Significant calls for interdisciplinarity in higher education can be traced back to Collier *et al* (1991) who supported the notion of '*a common culture for all students...on built environment courses'*. Wood (1999) further highlights that '*a crucial aspect of the debate on interdisciplinary education is the place and value of common studies'*. Both Wood (1999) and Chapman (2009) further identify two suitable approaches to the notion of commonality, essentially based either on common knowledge bases (for example through shared modules or on a smaller scale lectures) or on the development of common transferrable skills. However, much of the evidence actually finds that '*common programmes were actually problematic'* (Wood, 1999) and '*even where...interdisciplinary programmes had been set up, there remain very serious inertias'* (Webster, 2008).

Project based learning is also seen as a key strategy for embedding interdisciplinarity. Multidisciplinary projects are widely viewed as an integral medium for generating a greater understanding of the difference in values and motivations at play whilst also breeding an appreciation of the abilities and skills which other professions can bring to the table (Wood, 1999 & Chapman, 2009). Despite widespread agreement of the value of integrated project work, respondents to a study by Wood (1999) indicated '*the remarkable ability of students to role-play their disciplines stereotypically and exhibit worrying degrees of prejudice'* and as such '*requiring students to work in a multi-disciplinary team, even repeatedly, does not automatically ensure that*

individuals collaborate'. Such project work must be carefully planned with clear learning outcomes to ensure the activity remains valuable.

Aside from teaching and learning strategies, the educational and institutional environment is also seen as a key consideration. Faculty structures have been identified as a potential factor, in some cases reinforcing independence and the lack of understanding between disciplines, not only by name, but sometimes physically where different campuses house these related disciplines. As Wood (1999) states '*meeting like-minded people from other disciplines in this context is difficult, with no forum for casual interaction'*.

However, although inter-disciplinary work is increasingly embedded in built environment HEI curricula, research by Sayce *et al* (2009) for ESRC/ASC found that graduates are often lacking in the skills needed for effective communication and relationships between disciplines. Also, Edwards *et al* (2009) highlighted that many built environment graduates still emerge from university without sufficient appreciation of the role of other disciplines and worse, with entrenched profes-sional stereotypes and ill-conceived perceptions of other disciplines. However, nei-ther paper examined the root of these perceptions.

Lipton *et al* (1991) define occupational stereotyping as *'a preconceived attitude about a particular occupation...about people who are employed in that occupation'*. Previous research into professional and occupational stereotypes/perceptions in the built environment by Loosemore and Chin Chin (2000) found that *'strong stereotypes exist between the occupational groups which contribute to construction projects'* which *'may be responsible for the confrontational relationships'* within the built environment. What is apparent throughout literature is that '*these stereotypes may lead ultimately to inter-professional tensions and hostilities'* (Edwards *et al*, 2009), seriously undermining interdisciplinary working practices and as such compromising wider goals such as sustainable communities. Randall reported in Smethurst (2008) recognises that '*there's still a frustrating lack of engagement between the professions...if you're going to solve problems you need to understand the bigger picture and not just default to the stereotypes.'* The potential impact of such tensions on built environment projects is articulately described by Edwards *et al* (2009);

> *"If planners have often been blamed for ignorance about design, architects are often viewed as reluctant to accept responsibility for the social and environmental imperatives articulated through planning policies and to engage in the communicative process among diverse interests which planners try to facilitate. Similarly, in the training of construction managers, it is still common to find that other professions are viewed as essentially a source of fancy ideas, delays and impediments to the brisk and profitable execution of projects."*

As previously noted, the most prevalent and enduring example of stereotyping amongst the professions is the demarcation between design (i.e. the architect) and construction (i.e. the builder, engineer etc.), often attributed to historical notions of a differentiation in social class. Additionally, the withdrawal of the architect from the process of construction into associations with art is often heralded as a contributory factor in the development of their '*somewhat temperamental stereotype*' (Moore, 2001). Furthermore, research by Imrie and Street (2006) looking into the specific attitudes of architects towards planners, found a common view that planning and architecture are *'two separate spheres'* and revealed *'a continuing antipathy of many architects towards planning and...a limited understanding of the constraints and contexts that influence...what planners are able to do'*. This negative stereotype reiterates the earlier findings of Tibbalds (1988) in *Mind the Gap*. However, these stereotypes can extend past simple segregation of roles to a more entrenched enculturation of professional identity, commonly described as '*professional socialisation*' (Cuff, 1991), defined by '*unique beliefs, values, attitudes, languages, rituals, codes of conduct, codes of dress, expectations, norms and practices*' (Loosemore and Chin Chin, 1999). This process is exemplified by an article in the Architects' Journal (2001) entitled '*Spot the Office Stereotypes...*':

"Type A: Score three points for every bearded, bespectacled, corduroy trousered gent who is prone to wearing bow-ties and, at 'black-tie 'events, 'fun' waistcoats or white jackets. A dying breed, although still some at director level.

Type B: Score one point for every 'young hipster' with:

Darker clothes than seems humanly possible; a shaven head (men only); 'odd' glasses with no frames or square frames, which make them appear serious and Germanic; or a 'vintage Americana' T-shirt.

Must work in practice with an obscure and single-worded title. Or acronym.

Type C: Score five points for every 'fancy dan'- suited, late 30s to 40s, sustainably 'aware' but drives a mean motor. Does a lot of commercial but talks big on low energy. Friends with developers. Goes to lots of parties. Smokes cigars."

However, as Moore (2001) highlights, although such imagery is essentially *'harmless fun'* which *'the industry may be able to see the humour in...there is increasing evidence that those outside the industry cannot'*. This is consistent with the view of Munns (1996) who recognises that due to the ephemeral nature of the built environment industry and society in general, people often resort to preconceptions and stereotypes as a basis for their relationships with others. As such, the danger of such stereotypes and images is evident, particularly to non-cognates and potential new entrants to built environment professions.

Whilst it is important to understand the nature and specificities of such stereotypes, identifying the source and propagation of these preconceptions is essential to development of methods to deconstruct stereotypes and build mutual understanding amongst built environment professionals during education. The theory underpinning this is based on the work of Mackie *et al* (1996) which suggests that understanding the formation of professional stereotypes can contribute to developing methods for their eradication. Hunt *et al* (2004) in their research relating to the accounting professional also recognise that *'this step is essential; one must identify how negative perceptions arise to determine how to combat them effectively.'* However, whilst research exists about what stereotypes are held by those in practice (see for example Loosemore and Chin Chin, 2000), there is a dearth of literature exploring the stereotypes held by students and graduates within the built environment and the source of such preconceptions. Work by Chan and Connolly (2006) considered the perceptions of the construction industry held by school careers advisers. Although their findings indicated the perception that the industry *'offers immense opportunities and one that is growing in diversity'*, the authors acknowledged that these views could not be taken as representative due to potentially positive bias. Due to this lack of built environment specific research, it is necessary to draw upon tangential literature in order to unpack the origins of potential stereotypes ingrained within students. The two branches will include; general literature regarding stereotypes and literature pertaining to influences and motivations on student career/degree selection; much of which presents an appropriate proxy for stereotyping.

Ultimately, *'people stereotype because the cognitive process of categorisation simplifies perception',* (Loosemore and Chin Chin, 2000) which, according to Hogg and Abrams (1988) reduces uncertainty by structuring limitless stimuli into manageable and distinct classes. Mackie *et al* (1996) suggest that *'stereotypes are over-determined'* developed from multiple influences and through a variety of learning sources (DeFleur, 1964). Stereotypes and professional traits may also evolve and develop as a result of competition over time. Webster (2007) notes that

'over time, practices that enhance the value added by members of a profession will accrue to the professional culture and practices that don't will tend to disappear'. This process of development could also foster the development and reinforcement of stereotypes within students; with students and professionals alike stereotyping professions in a way which generates competitive advantage. The box below overleaf gives an extended quote from Webster (2007) which highlights this point.

> *"The respective cultures within...architecture and planning education and practice communities may be giving members of the former the ability to outbid the latter in the production of master plans. Second, construction managers seem to have acquired the knowledge to outbid architects to lead complex construction projects".*

Research pertaining to student career choices is also a useful surrogate for identifying influences and potential sources of stereotypes. Throughout both the subject specific and tangential literature, five principal roots of occupational socialisation and stereotypes emerge:

Family (Parents, siblings and other family members)

A significant amount of research reports the powerful influence of parents in portraying occupational perceptions (see for example; Meece *et al*, 2006 & Parsons *et al*, 1984). Recently, the ConstructionSkills (2007) *Positive Influence* report confirmed these findings specifically within the built environment industry, noting that parents have a key role in '*overcoming outdated perceptions'*. Research by Millward *et al* (2006) for the DTI also finds that young people rely strongly on parents not only for job advice, but also as a source of job knowledge and understanding; reiterating the potential pathway for the "passing on" of stereotypes. In addition to parental influences, siblings are also shown to impact career and job perceptions (Dunn *et al*, 1994).

Educational institutions, educators and careers advisers

Research by The Gallup Organisation (1991) found that high school teachers were second only to parents in influencing career decision and perceptions of particular occupations. Careers advisers are recognised as having a critical role in breaking stereotypes within the construction industry (ConstructionSkills, 2007) with Chan

and Connolly (2006) finding that careers advice given or received in schools does little to promote positive and realistic perceptions of construction work. Allied with the fact that the role of the careers adviser has intensified (Morris *et al*, 2000) and that their advice is increasingly trusted (Howieson and Semple, 2001), the stereotypes and perceptions held, and potentially transmitted by careers advisers are a potentially significant.

Mass media

DeFleur (1964) suggests that among the principal influences, '*the mass media appear to play a major role'*. Within this broad bracket, television has attracted a significant amount of specific research with Hoffner *et al* (2006) noting that *'television often transmits an inaccurate, stereotypic image of how people behave and communicate in various occupations'*.

Moore (2001) illustrates at length the role of media in the contemporary stereotyping of the built environment industry, particularly construction. Moore highlights several media sources of stereotypes, noting that *'a random scan of the construction press at any time is almost certain to encounter negative images used to assert the industry's identity'*. Along with this he cites advertising and television, both documentary and fictitious, as sources of stereotypes. Whilst some may foster a more positive stereotype, take for example Grand Designs and Bob the Builder (see box overleaf), others may not. Research by the National Federation of Builders (2001) (reported in PR Newswire, 2001) found that the *"frenzy of documentaries about rogue builders"* have contributed to the stereotype and negative perception of the construction profession, whilst documentaries such as Property Ladder do little to dispel negative images of greed amongst developers & real estate agents.

Work experience and colleagues

With the majority of research on professional stereotypes focussed on those individuals operating within the industry, there appears to be a clear assumption that the majority of this professionalization and enculturation process occurs within practice. Supporting this, Webster (2007) directly suggests that much of a professional culture is '*learned on the job'*. What emerges from literature is the perception that work colleagues can act as a source in two ways; either through the conformity or otherwise of their own personal characteristics and behaviours or through the imposition of their own stereotypical beliefs.

Specific research looking at work colleagues as a source of stereotypes is sparse. Research into other professions, such as the work of Wells *et al* (2008) into accounting, suggests that tensions between professionals and their co-workers can play a significant role in the formation of perceptions. Additionally, In their paper looking at the therapy professions, Parker and Chan (1986) suggest that work experience and practice within industry may have an impact upon stereotypes; but did not propose whether this is a strengthening or deconstructing effect. Findings from Millward *et al* (2006) also support the contention that work experience is a key factor, stating that '*personal experience is clearly the primary source of all job knowledge, derived...directly (through work shadowing /observation or actual work experiences)*'. Cory (1992) points out that stereotypes can be remoulded through contact with a colleague or work partner who did not conform to the common perception.

The "Bob the Builder" Effect

Of the range of media representations of built environment, Bob the Builder is perhaps the most widely recognisable. Although essentially a popular children's cartoon character, since his debut in 1999, the Bob the Builder ethos has been cast across the globe in 66 countries and it is recognised that the industry '*has benefited from the success of...Bob the Builder*' (Loosemore, Dainty & Lingard, 2003) and the positive stereotype it portrays. Moore (2001) provides an articulate illustration of the characteristics of Bob the Builder:

> '*Bob's behaviour is almost entirely positive, presenting...the expectancy that constructors can do a good job (Bob's motto: Can we fix it? Yes we can!). Not only that, but that they are considerate to wildlife and the environment [in Bob Saves the Hedgehogs], willing to trust other members of a team [in Wendy's Busy Day] and engender the goodwill of others [in Bob's Bugle].*'

Bob's audience are potential participants in the built environment industry and '*this generation may well be the first for a long time to grow up with a positive stereotype of constructors*' (Moore, 2001). However, aside from the ability to shape the perceptions of his younger audience, Langford and Robson (2003) also suggest this could extend to the wider profession. As such, many recognise that the potential impact of this positive occupational representation is two-fold; not only attracting more students to built environment careers, but students which are free of negative stereotypes and, with the foundations of an interdisciplinary attitude.

Within the built environment domain, Moore (2001) traces through time the development of built environment stereotypes and demonstrates how these to self-perpetuate and reinforce amongst the various professionals. Moore and Dainty (2001) found that '*professional prejudices based on the hierarchy*' reinforced exclusive relationships within projects.

Summary

Literature undoubtedly highlights a serious issue with occupational and professional stereotyping within the built environment; one which threatens to derail any attempts to move towards effective interdisciplinary collaboration within the industry. However, despite recognition of the gravity of the problem, there is little evidence of action within both the industry and higher education to identify and tackle the sources of these entrenched inter-professional perceptions. Much of the research calls for clear action to both deconstruct existing and avoid introducing, stereotypes in built environment students, whilst equipping them with the necessary skills and knowledge to foster integrative working. Without such action, these stereotypes will continue to self-perpetuate.

Research Findings

The Sample

The questionnaire was distributed to all students within the identified course sample. A total of 58 responses were received, representing a response rate which is slightly lower than anticipated primarily due to the timing of distribution.
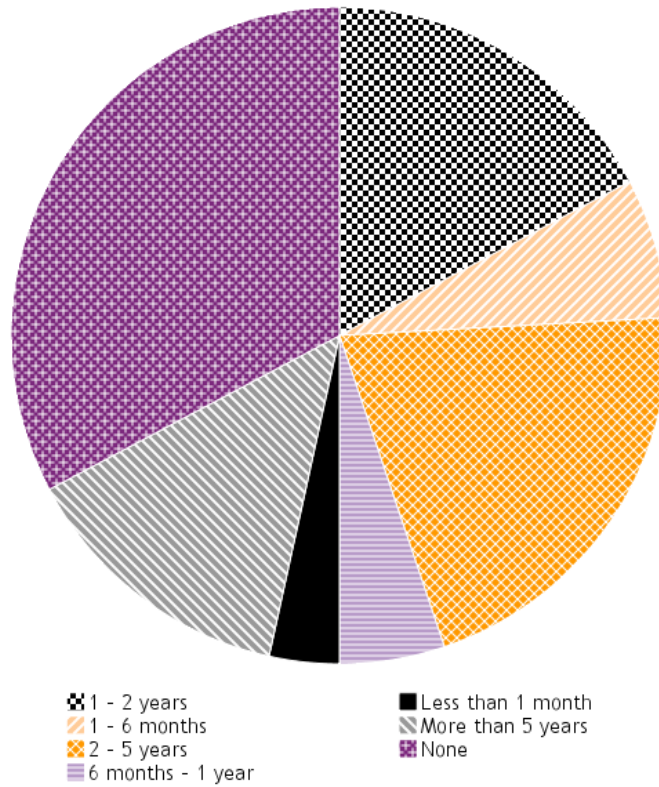
Within this, the survey sought to achieve an even blend of respondents from all degrees and levels of study. In terms of degree, those undertaking construction related courses engaged least with the study (2 responses) and as such, separate analysis will not be undertaken for this professional route. The chart below shows the composition of respondents by professional route and level of study, demonstrating relatively significant contributions from Quantity Surveying, Architecture and Planning, and an even distribution with regards to level of study.

Breakdown of Respondent Degree Routes by Level of Study
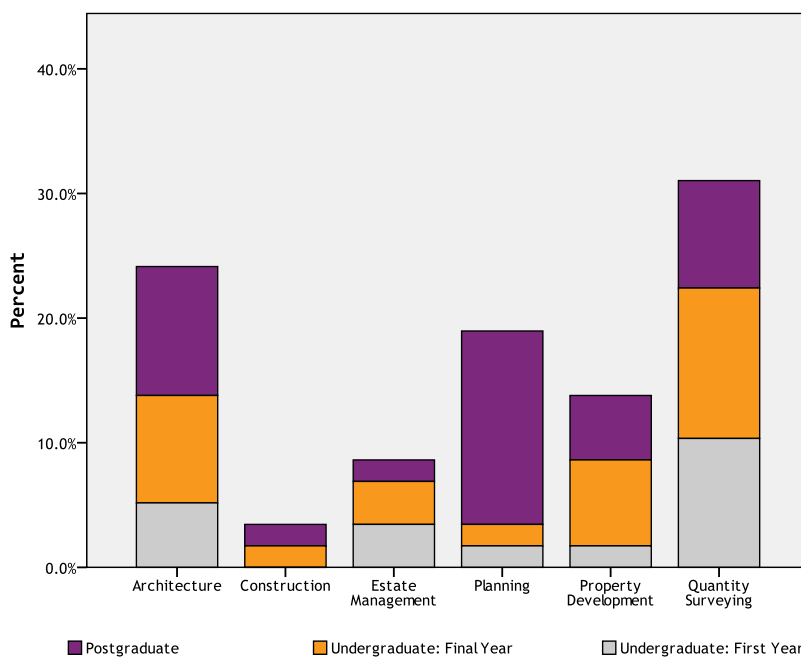
Another important characteristic of the sample population is the level of industry experience held by respondents, as this could likely influence the gravity of any stereotypes and perceptions. What is clear from the chart opposite is that work experience amongst the respondent populations is broad and even distributed with 48& of respondents having less than 1 years experience and 52% more than 1 year.

Level of Industry Experience

Legend:
- 1 – 2 years
- 1 – 6 months
- 2 – 5 years
- 6 months – 1 year
- Less than 1 month
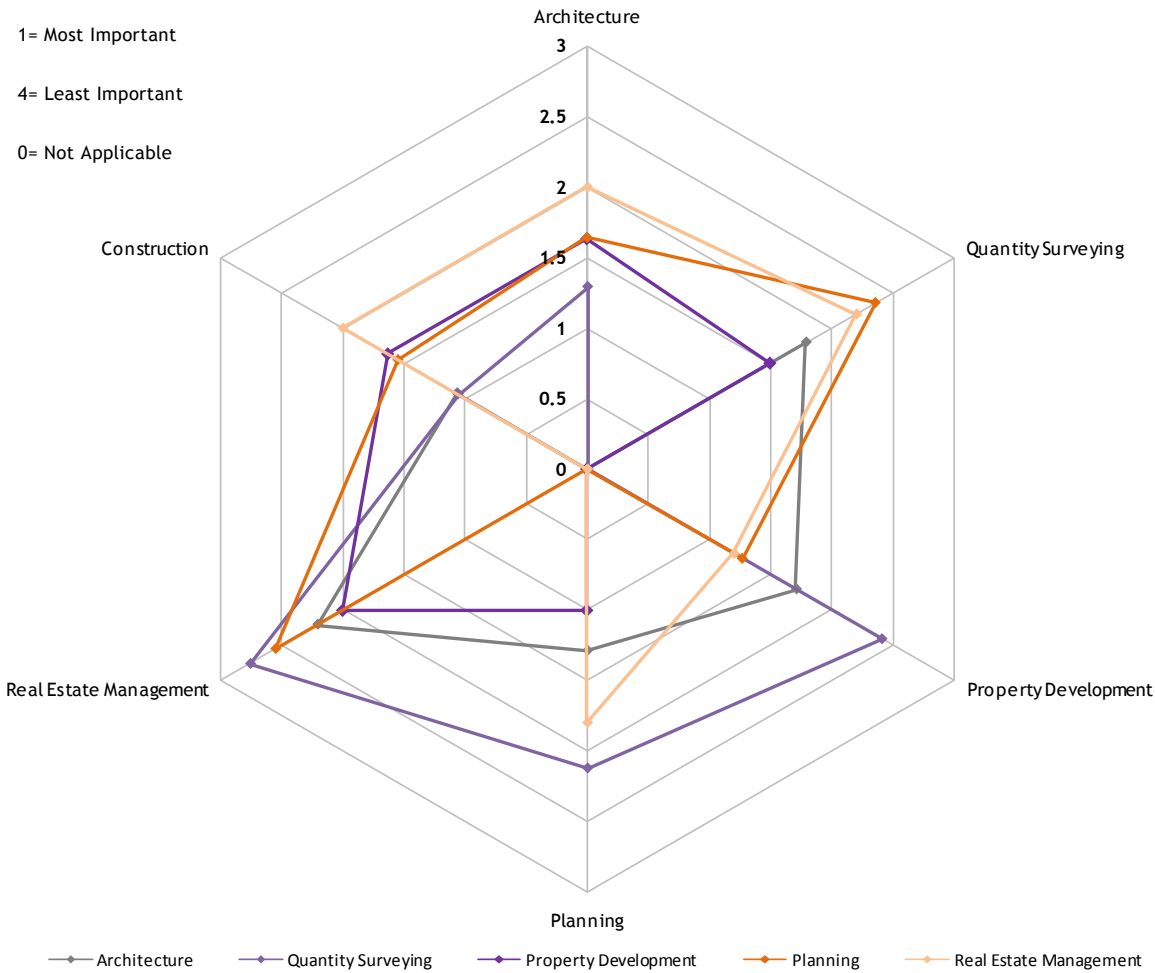- More than 5 years
- None

With respect to potential sources of stereotypes, 83% of respondents indicated that they had friends or relatives working within the built environment (BE), whilst 42% stated that they had received some form of structured careers advice relating to the various BE professions. The potential impact of such characteristics on the stereotypes and perceptions held by students will be discussed in greater detail in the following analysis.

Inter-professional Relationships

Identified as one of the key mandates for the BE industry moving forward is the need to both recognise and strengthen the relationships and engagement between the various disciplines. As such, a central piece of this project was to understand how students of BE courses view their relationships with other professional routes. Responses were analysed by professional route in order to compare how students perceive their relationship with the various other professional routes. The amoeba chart overleaf shows the average level of importance placed on the various interdisciplinary relationships by students.

Importance of Relationships Between Professions

1= Most Important

4= Least Important

0= Not Applicable

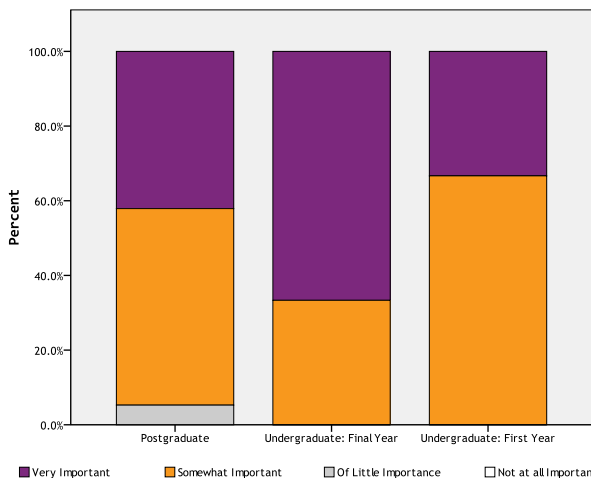Legend: Architecture, Quantity Surveying, Property Development, Planning, Real Estate Management

What the spider graph shows are the relationships which are viewed as most important, profession by profession, the lines indicating students responses within each professional route. Within this, the majority of students across disciplines perceived their relationship with the construction profession to be most significant, perhaps resulting from their involvement in the physical building process. At the other end of the spectrum, interactions with the real estate management profession were seen of much less importance across the board, potentially resulting from the involvement more towards the end of built environment projects. In addition to this, results suggest that students undertaking courses within the property development professional routes generally view relationships across the spectrum as of higher importance (average = 1.552). Particularly important relationships emerge between property developers & planners (x = 1.00) and also between both architects & construction (x = 1.07) and quantity surveyors & construction (x = 1.06). What is perhaps interesting is that,

by and large, there was mutual agreement between parties with regards to specific inter-disciplinary relationships (i.e. Architecture - Property Development = 1.71/Property Development - Architect = 1.63).

When relationship importance is analysed against level of study, an interesting pattern emerges within the results. Looking at first and final year undergraduate students, the perceived importance of relationships with other disciplines grows as students progress throughout their degree. However, when postgraduate perceptions are considered, the importance of relationships falls back to a level similar to that indicated by first year undergraduate students. The charts below demonstrates this pattern with respect to the perceived importance of relationship with the architecture and quantity surveying professions; however a similar pattern is also apparent when looking at relationships with property development and real estate management.

Importance of Relationship with Architecture Profession   Importance of Relationship with Quantity Surveying Profession
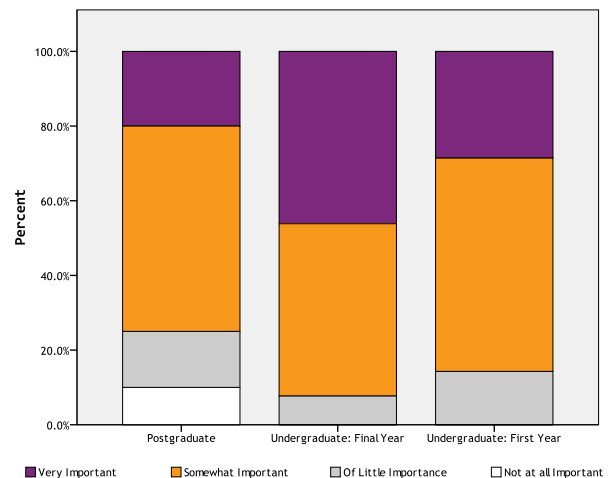
The potential explanation for this relationships is bipartite. Firstly, this could be explained by the introduction of non-cognate students at postgraduate level with limited or no prior knowledge of the built environment and who are therefore more likely to rely upon stereotypes when forming career choices and professional relationships. Alternatively, this could be attributed to the specific effect of the combined and integrative learning and teaching which occurs more frequently within undergraduate shared modules, projects and the ongoing effect of shared learning space and shared academic support centre available at Kingston University.

Built Environment Hierarchy

An important part of the stereotypes held by built environment students is the importance they attribute to the contribution of the various professional routes to the built environment overall. Such perceptions can have a significant influence on developing trust and notions of professional superiority can contribute to the historically divisive professional silos. Therefore the research sought to identify such perceptions and establish the professional hierarchies held by students.

The scales below demonstrate the professional hierarchies that exist within students of the various built environment disciplines. An interesting finding emerging from these tables is that, with the exception of architecture students, no other professional route felt that they were singly the most important profession within the built environment. In this respect, architecture student seem to maintain the most entrenched perceptions of professional superiority. However, when this is read against the importance placed on architecture by other disciplines, it becomes clear that this view of importance is held generally amongst built environment students (x = 1.26).

Architecture

Architecture	1.36
Construction	1.86
Property Development	2.00
Planning	2.00
Quantity Surveying	2.21
Real Estate Management	2.71

Real Estate Management

Construction	1.00
Architecture	1.20
Property Development	1.20
Planning	1.20
Real Estate Management	1.20
Quantity Surveying	1.40

Property Development

Planning	1.13
Property Development	1.25
Construction	1.38
Architecture	1.50
Quantity Surveying	1.63
Real Estate Management	2.00

Planning

Planning	1.09
Construction	1.09
Architecture	1.18
Property Development	1.27
Quantity Surveying	1.73
Real Estate Management	2.36

Quantity Surveying

Construction	1.06
Architecture	1.18
Quantity Surveying	1.18
Planning	1.44
Property Development	1.94
Real Estate Management	2.18

Mean (exc. self)

|	
Architecture	1.26
Construction	1.31
Planning	1.58
Quantity Surveying	1.80
Property Development	1.76
Real Estate Management	2.31

When these statistics are translated into an amoeba chart, it becomes clear that students studying architecture are likely to rate the importance of other professional routes lower (demonstrated by the relatively wide radar) whilst

students of real estate management courses value the contribution and role of other professions far greater (demonstrated by the tight radar).

Aside from these general findings, a specific and important pattern seems to be emerging within students from the quantity surveying discipline. Considering analysis of their responses to both relationships and importance within the industry, a clear split becomes apparent with noticeably more favourable perceptions towards Architects & Construction than towards Real Estate, Planning & Property Development. This could potentially result from the commonly identified split between those seen to be directly involved in the physical construction process and those believed to be more removed or alternatively from the cost versus value arguments prevalent amongst the professions.

Importance of Individual Professions within Built Environment Industry
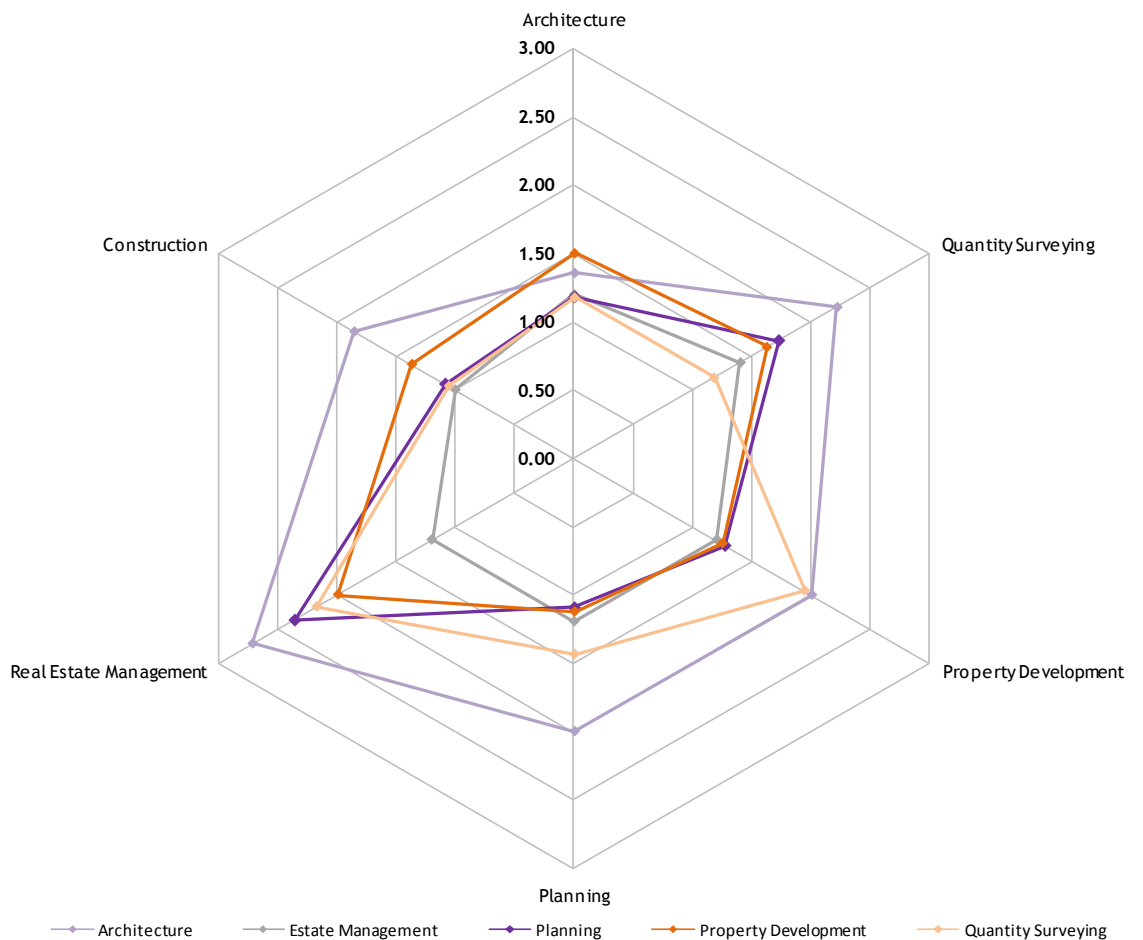
Professional Personality Traits

Professional stereotypes are widely recognised as one of the most significant barriers to improved engagement and interdisciplinary working. One of the integral aims of this work is to examine the extent to which common stereotypes, such as the quantity surveyor as a "boring brick counter", are held by students and to develop professional personality profiles among students.

Respondents were asked to rank, for each professional route, how closely a series of positive and negative personality traits match their personal perception. From this, two sets of analysis have been carried out. Firstly, personality profiles have been developed based upon the overall positive and negative traits identified by students. Secondly, the positive and negative traits have been combined and using Anderson's (1968) likeability ratings, an overall likeability score has been developed. This allows us to not only identify the common characteristics which need to be dispelled or clarified within the education of students, but also areas where particular tensions could arise between professional routes.
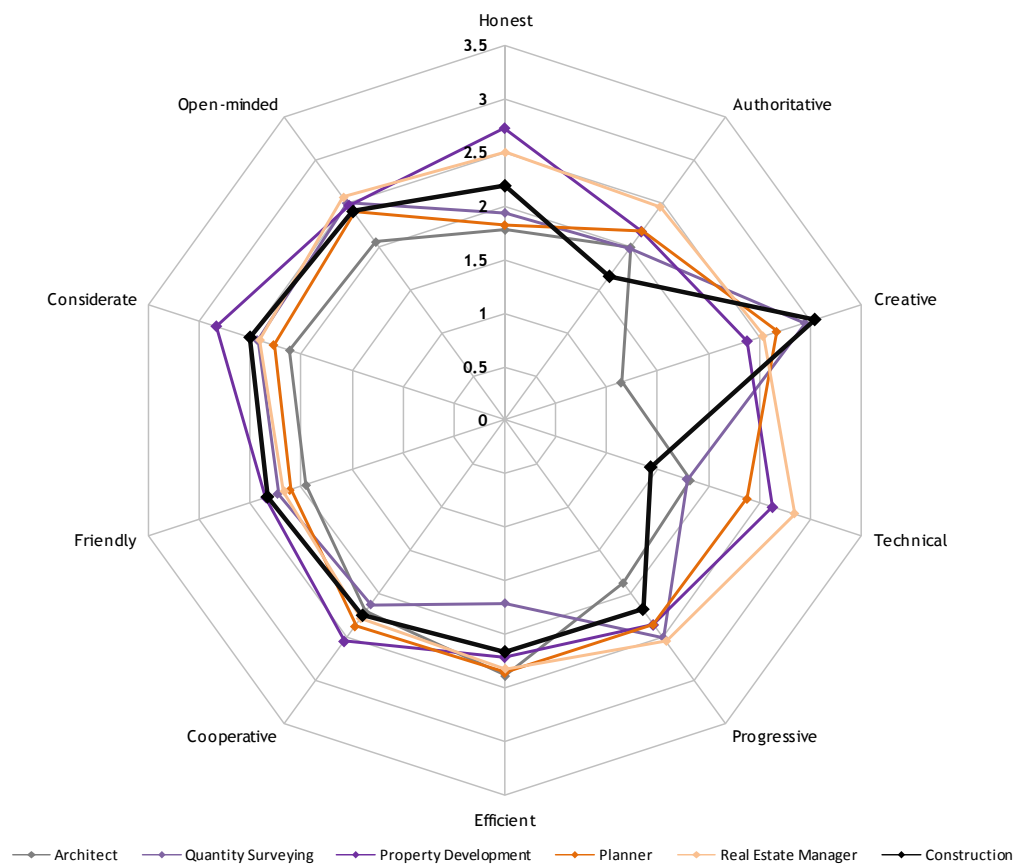
Personality Profiles

The literature review demonstrates that professional stereotypes can commonly be founded upon the personality traits of those individuals working within a particular discipline as much as the tasks they undertake. As such, one of the aims of the study is to understand how built environment students perceive the various other disciplines and specifically the extent to these match the stereotypes commonly mentioned and portrayed within literature and media (as identified in the literature review).

Firstly, the amoeba charts overleaf compare the ratings of positive and negative traits across the various professional routes. Looking at the positive traits, there are two particularly significant points to be drawn out. The first is the perceived lack of creativity within the built environment professions with the prominent exception of the architecture profession. When this is combined with the *progressive* trait, it suggests that built environment students perceive architects as the driving force of innovation within the industry. The second is a recurrence of the split between those professions which are seen as integral to the technical side of the built environment (architecture, construction & quantity surveying) and those which do not demonstrate these technical traits (property development,

planning & estate management). Perceptions relating to traits such as technical and creative, which are essentially a view on the skill sets of the various professions, are likely to have a significant impact upon the selection of project team members, both during the education process but also in subsequent careers. What is perhaps surprising is that the soft skills such as negotiation and mediation which form an essential part of the skills set of planners and estate managers, were not picked up, with both professions ranking lowly in the cooperative trait. Additionally, the financial and mathematical skills of estate managers and developers, were not picked up by the technical trait, suggesting that students associate technical skills with the pure construction of buildings.

Overall Positive Traits by Profession

Architect · Quantity Surveying · Property Development · Planner · Real Estate Manager · Construction

Overall Negative Traits by Profession
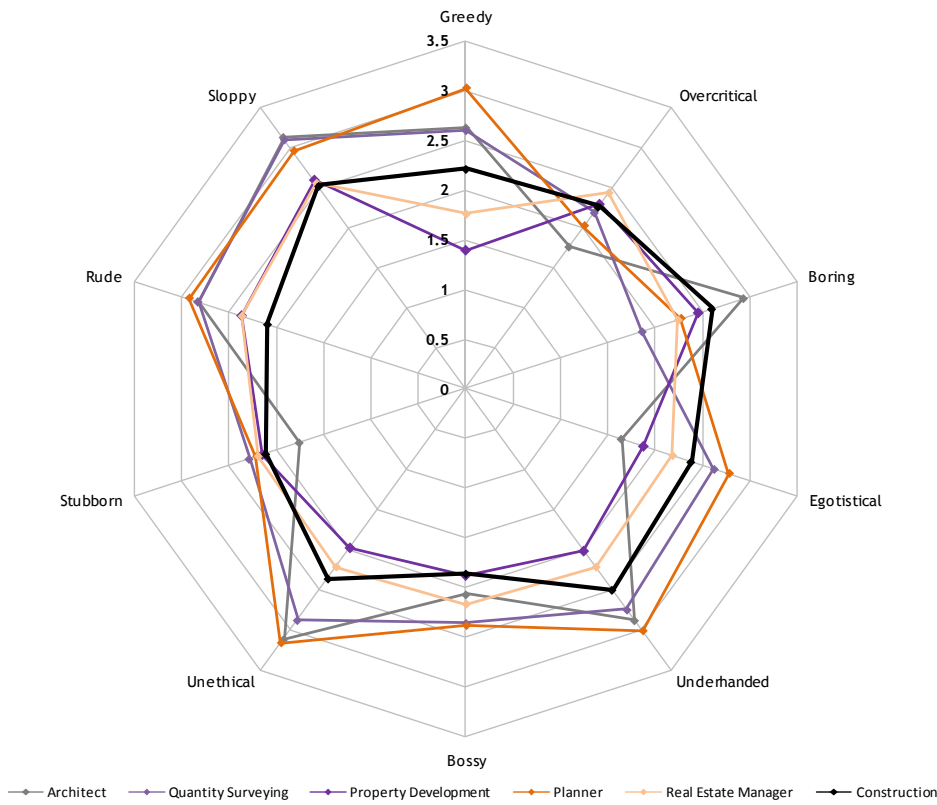
What becomes clear from the box overleaf is that common stereotypes seem to have permeated built environment students perceptions. The box shows the four strongest personality traits (combined positive and negative). Taking, for example, architecture, BE students echo clichés of artistic and self-important individuals, whilst similarly, the strength of traits such as *boring* and *technical* with respect to quantity surveyors mirror traditional notions of "the boring brick counter".

This strong resonance between student perceptions and traditional stereotypes suggests that they are not formed independently by each individual student, but perpetuated and reinforced by external sources. Identifying the most prevalent sources and pathways for students to inherit these stereotypes is therefore an important step in developing appropriate teaching and learning strategies to deconstruct them. This issue will be addressed in greater detail later in the paper.

The personality trait ratings were also examined with respect to the level of experience of each respondent. It could be reasonable to expect that industry experience and working alongside the various professions on a day to day basis could lead to more certain ratings against the various personality traits (i.e. more instances of 1 - to a great extent & 4 - not at all ratings). However, analysis identified no noticeable correlation between level of experience and strength of perceptions.

Strongest Stereotypes

Architect

Creative; Egotistical; Overcritical; Stubborn

Quantity Surveyor

Efficient; Technical; Boring; Honest

Property Developer

Greedy; Bossy; Egotistical; Unethical

Planner

Honest; Overcritical; Friendly; Authoritative

Real Estate Manager

Greedy; Egotistical; Bossy; Friendly

Construction Manager

Technical; Authoritative; Bossy; Rude

Likeability Scores

Whilst looking at traits independently highlights some specific issues, it is equally important to examine the cumulative effect of these profiles, particularly with respect to the impact on "likeability" and by inference, willingness to form relationships. By combining the student questionnaire responses with the likeableness ratings developed by Anderson (1968), an overall likeableness score has been developed for each inter-professional relationship. The scale overleaf shows all of the personality profiles in order of strongest to weakest and begins to clearly demonstrate certain areas where entrenched negative stereotypes are present and thus more likely to hinder effective interdisciplinary working.

Turning firstly to the averages, it is clear that built environment students view planners as the most likeable profession within the industry. Scores for quantity surveyors and architects are also shown to be favourable. Conversely, students view those within property development and real estate management as strongly objectionable. Such perceptions are likely to have a significant impact on willingness to develop relationships with such disciplines.

PD-P	11984	REM-QS	9540	QS = Quantity Surveying	
AVG-P	**11152**	**AVG-C**	**9480**	A = Architecture	
A-QS	11021	PD-C	9302	PD = Property Development	
PD-QS	10863	REM-PD	9196	P = Planning	
P-QS	10830	REM-A	9145	REM = Real Estate Management	
QS-P	10830	P-C	9065	C = Construction	
PD-A	10701	REM-C	8732	**AVG = Overall Mean**	
AVG-QS	**10620**	QS-PD	8722		
P-A	10616	PD-REM	8703		
QS-A	10585	**AVG-REM**	**8687**	Highest Score = Most Likeable	
A-P	10577	P-PD	8495		
AVG-A	**10570**	**AVG-PD**	**8144**		
REM-P	10292	QS-REM	7806		
A-C	10166	A-REM	7015		
P-REM	9852	A-PD	6440		
QS-C	9621				

Some noteworthy points emerge from the scale. Students of property development courses indicated the highest degree of likeability towards planners, however, in stark contrast, planning students rated those in property development as 5th lowest. Similarly, property development students also indicated a strong level of likeability towards architects (7th strongest), however this was far from reciprocated with architecture students ranking property developers lowest overall. Some areas of mutual respect do emerge from the survey, particularly between quantity surveyors & planners, architects & quantity surveyors and architects & planners.

When personality traits are analysed separately for those with relatives working within the built environment, an interesting finding emerges. For all professions, students with relatives working in the industry indicated a higher overall likeability than those who do not have relatives engaged in the built environment. These results chime with the Construction Skills (2007) report which suggested that the guidance of parents and relatives is particularly important in '*overcoming outdated perceptions and pockets of bad practice within the industry*'. Such results are perhaps unsurprising as students with parents working within the built environment profession are much more likely to have been exposed to parents' projects and colleagues and thus can base personal views on real life experiences rather than popular stereotypes.

Impact of Relatives Engaged in Built Environment on Student Perceptions of Professional Likeability
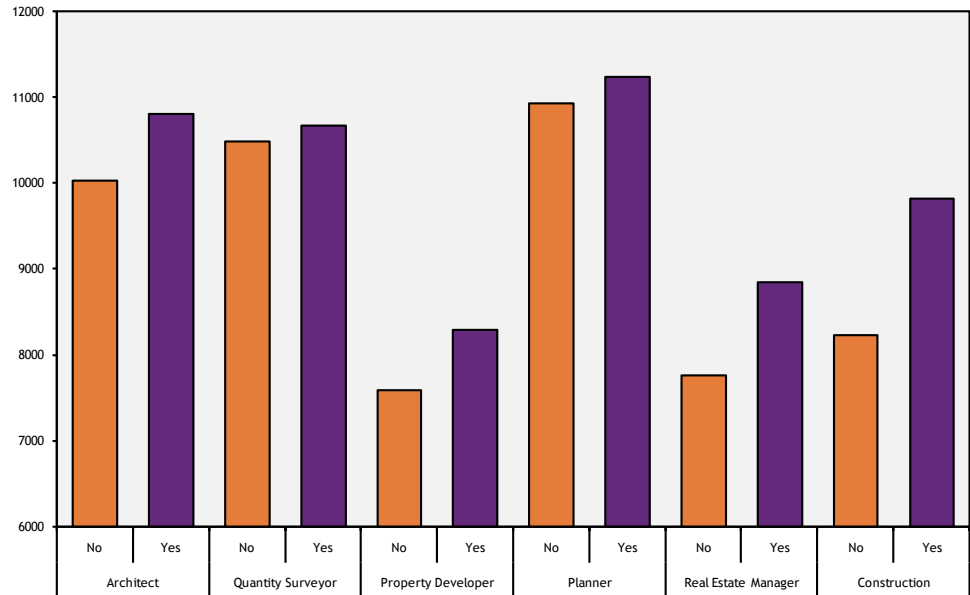
Likeability scores were also calculated dependent upon the respondents level of study in order to determine how progression through the degree programme was affecting the perceptions of students in terms of personality traits and likeability. Evidence suggests that, if anything, students perceptions actually become more negative as they progress through undergraduate education. Postgraduate education seems to be more effective at deconstructing stereotypes with students generally indicating the most positive personality profiles and greatest likeability scores.

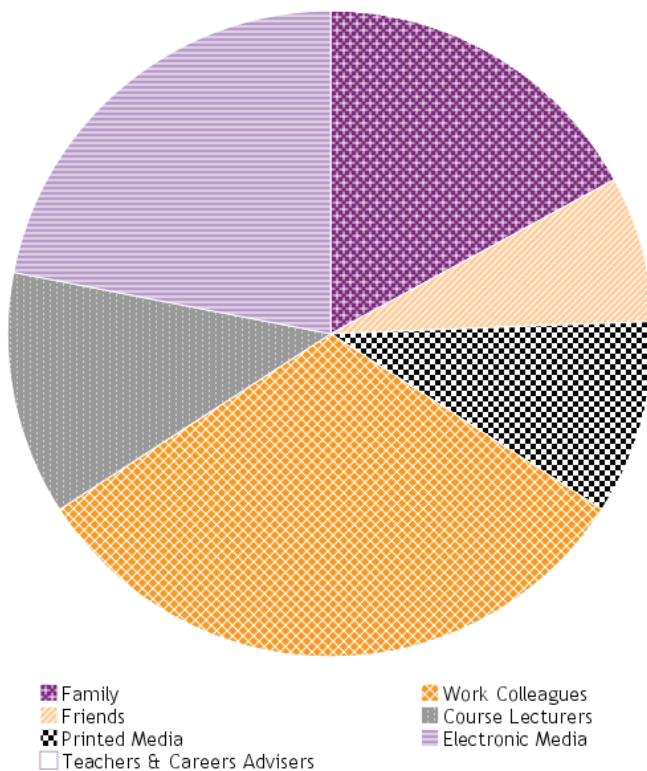**Likeability Score by Level of Study**
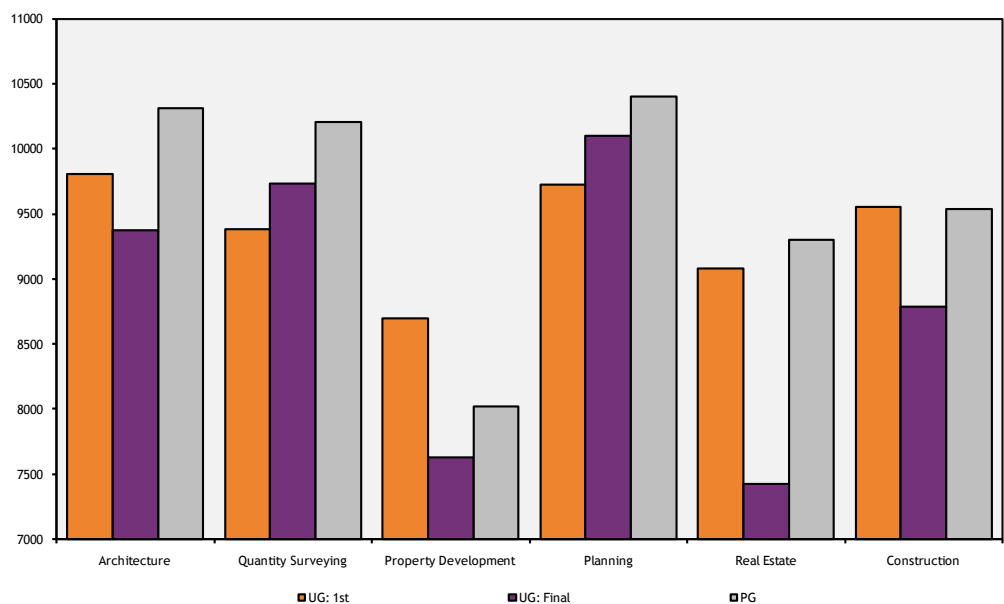
Sources of Stereotypes

As the literature review revealed, understanding the sources and pathways of permeation of stereotypes within students is a central step in developing effective strategies to re-educate and break down such tensions. Students were asked to rank on a likert scale the impact they felt selected sources had on the spread of built environment stereotypes. In addition to this, the survey asked students how their personally held stereotypes had been affected by progression on their degree. This in particular helps to examine whether higher education is effectively tackling the issue of stereotypes and equipping students with the necessary skills for interdisciplinary working or whether it is reinforcing them.

The findings from these questions clearly confirm the importance early action to deconstruct stereotypes held by students before they embark upon their future careers. Almost a third of all respondents indicated that work colleagues were the most significant source of their own personal stereotypes. As such, if future graduates continue to be sent out into industry still holding similar entrenched perceptions, the issue will continue to self-perpetuate.

Most Significant Source of Stereotypes

Legend:
- Family
- Friends
- Printed Media
- Teachers & Careers Advisers
- Work Colleagues
- Course Lecturers
- Electronic Media

Additionally, electronic media was reported by 22% of students as the most significant contributor to the spread of stereotypes, in line with findings from research identified within the literature review. In contrast, only 12% of respondent students viewed university course lecturers as the most significant source. These results suggest that, in the main, external or pre-university sources are the most significant contributors to students' perceptions.

However, when the average ratings are considered (see box below) the contribution made by course lecturers to the proliferation of stereotypes emerges third highest. This suggests that whilst other sources provide the strongest stereotypes, university lecturers play a somewhat confirmatory role; evidenced by the high proportion of 2-4 ratings received.

| BOX XXX: Most Significant Sources	
Work Colleagues	*3.22*
Electronic Media	*3.39*
Course Lecturers	*3.54*
Friends	*3.95*
Printed Media	*4.00*
Family	*4.71*
School Teachers/Careers Advisers	*5.20*

Interestingly, family is recognised as one of the least significant sources of stereotypes for students. Whilst this figure will perhaps be affected by those whose family were not engaged in the built environment and therefore less likely to have perceptions to pass on, it does in some ways support the earlier findings in this paper. Where students have relatives within the built environment, they were shown to indicate higher likeability than those who did not, suggesting that for most, family is not a source of stereotypes but instead plays a significant role in dispelling those which have been "learned" elsewhere.

What is extremely noticeable is the very limited significance given to school/ careers advice in the development of perceptions and understanding of the built environment professions. With literature so strongly recognising the school environment and careers advice as an important opportunity for promoting the built environment, the very fact that students do not pick up any influence from

this pre-HE domain suggests that not enough is being done to capitalise on this potential.

These findings were also supplemented by students responses to how their perceptions have changed during the course of their degree. It becomes clear that the HE teaching and learning experience is not doing enough to contradict the negative stereotypes already held by students. Just over 60% of students indicated that their perceptions had been reinforced or strongly reinforced during their degree whilst very few recognised any form of contradiction, reiterating the notion of a confirmatory role played by higher education.

Change to Perceptions over Course of Degree

Legend:
- Contradicted
- No Effect
- Reinforced
- Strongly Reinforced
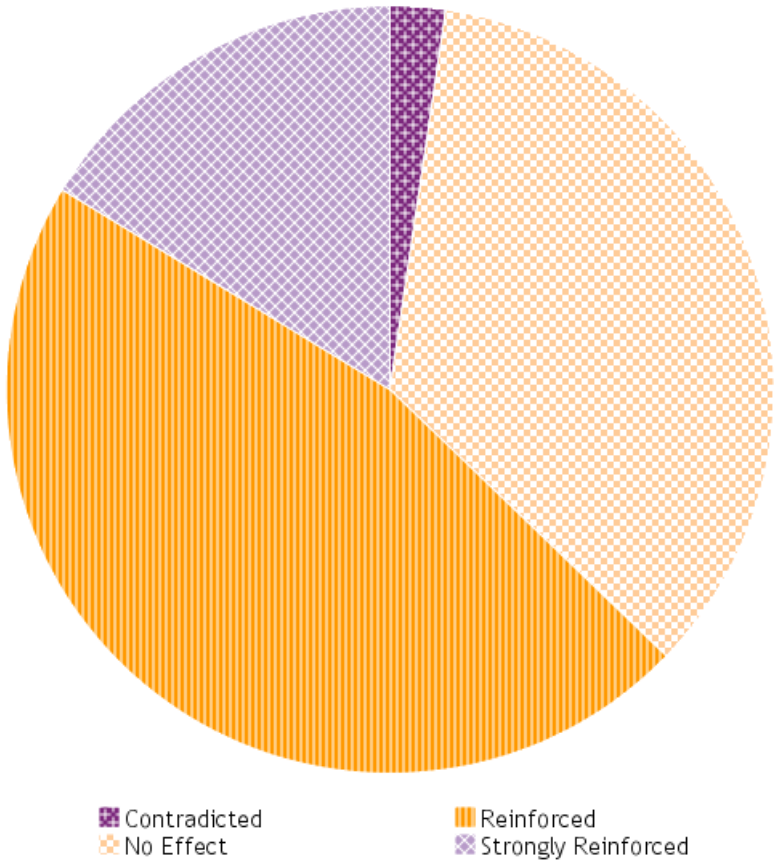
Analysis was also undertaken to determine whether departmental organisation at the university had any impact upon the perceptions of students. Courses for Surveying, Real Estate and Planning are all housed within one School with a dedicated shared space (C-SCAIPE) whilst students in architecture are in a separate school. Whilst it would be reasonable to predict that there would be greater opportunity for interdisciplinary collaboration amongst the former, results show that there is no significant difference in change to students perceptions. However, this does not necessarily suggest that the shared space is of no value, but perhaps not capitalised upon. If students stay within their course or professional groupings, then cross-professional interaction is unlikely to occur; suggesting that more needs to be done to introduce interdisciplinary work within the curriculum in order to kick-start these relationships. In recognition of this, interdisciplinary project work features centrally at all levels of undergraduate programmes within the School of Surveying & Planning. Students are obliged to form project teams with colleagues from different disciplines to carry out a project, normally incorporating a short block field trip. The rationale behind this is to not only expose students to the skill sets of other disciplines, but also strengthen and build social links outside of students traditional groupings. In addition to this, teaching and learning strategies also utilise role swapping where students are encouraged to approach a scenario from the viewpoint of another disciplines (e.g. Planners are tasked with producing appeal documents from the perspective of a property developer). As Wood (1999) discusses, this is vital to interdisciplinarity because it '*exposes students to the pressures and problems faced by others, helping them to understand and value'* the values and subsequent actions of other professions.

Conclusions

Interdisciplinary practice is undoubtedly rising on the built environment agenda, however, it remains in some degree hindered by stereotypes held by both current and future professionals.

Openness to building relationships is paramount to increasing interdisciplinary working moving forwards. As Egan (2004) highlights, professionals are increasingly being required to build relationships with other disciplines which they previously felt *'they had nothing to do with'*. Results from this small-scale study suggest that, by and large, built environment students view cross-professional relationships as important. However, there are also some inter-professional relationships which are not deemed to be important; particularly those with the real estate profession and between quantity surveyors and professions which are less involved in the physical construction process. It is these areas in particular which need address as such perceptions will lead to a lower willingness to build certain interdisciplinary relationships and consequently, professional divisions will remain in place.

What is encouraging is that the perceived importance of interdisciplinary relationships increases as students progress through their undergraduate degree. This suggests that both learning environment (such as the shared C-SCAIPE social space) and collaborative project work do contribute to raising awareness of the need for interdisciplinary working and strengthening communication skills amongst students. Whilst importance does fall at postgraduate level to a similar level to that of first year undergraduate students, this is likely due to the presence of non-cognate students and suggests that specific action targeted at the early stages of both undergraduate and postgraduate courses would be beneficial. Such action is widely supported in literature; *'if we do not change at the beginning then we have lost the battle'* (Wood, 1999).

Notions of professional superiority have been highlighted as a particular factor behind traditional divisions within the built environment. It appears progress is being made on this matter but architecture students still identify their own profession as the single most important within the built environment. This could relate to the education model which is radically different from those across Surveying & Planning, which are more comparable to models within law and accounting. Importantly, what this demonstrates is that built environment students have a profound appreciation of the role and contribution made by other professions into the built environment. Such understanding is an important foundation for the development of inter-professional relations. However, a split does manifest between those professions directly involved in the physical process (i.e. architects, quantity surveyors and construction professionals) and those which are perhaps more removed from this (planners, real estate managers). This issue is one which needs particular attention if interdisciplinarity is to be achieved

throughout the built environment life cycle.

Literature identifies a vast number of stereotypes relating to the built environment professions, with common characteristics emerging for each group. Evidence suggests that these common stereotypes have quite strongly permeated the personal perceptions of students. Such findings reinforce the need for higher education to not only work towards contradicting these "default" stereotypes, but also ensure that staff themselves do not transmit them. Likeability scores identify a highly variable picture with several relationships where mutual respect is apparent and others where personality perceptions are likely to significantly hinder effective cross-professional relationships; most significant of which is the highly negative view of property developers and real estate managers. However, context may also have a bearing on these perceptions, with widespread reports of the contribution made by over-priced property to the economic turmoil potentially exacerbating negativity towards these professions in particular. That said, it is clear that more needs to be done to tackle stereotyping during courses, with progression on undergraduate programmes actually being shown to exacerbate negative stereotypes in some cases with likeability scores falling dramatically.

The outcomes for students are clearly dichotomous. Whilst on the one hand heartening progress is being made to instil a fundamental appreciation of the need for interdisciplinarity and an understanding of the importance of other disciplines, little is actually being done to break down the enduring stereotypes which cause tensions and conflict to manifest between project teams.

Despite the identified potential for school education to promote the built environment industry, it was clear from students responses that this potential sphere of influence is not being sufficiently utilised. Whilst there was some indication that course lecturers were seen as a source of stereotypes, evidence points to the fact that they play more of a confirmatory role, reinforcing the perceptions already held by students. Whilst this highlights the need for individual staff to be mindful of transmitting any personal perceptions they may hold, the more significant challenge comes from tackling the other key sources; work colleagues and electronic media. The latter is perhaps problematic as there is no direct pathway for universities to influence electronic media. However, there is clear scope for engagement and input from the relevant professional bodies to begin to change these negative portrayals in the media. The former however, is where major progress can occur. Engagement between higher education institutions (HEIs) and industry is an important first step, however breaking the cycle of stereotyping is key. As more and more students enter built environment professions devoid of negative stereotypes and with the mindset and skills for interdisciplinary working, a gradual breakdown of these self-perpetuating professional hostilities will occur.

Recommendations

The combined findings of the literature review and pilot study present a significant platform for progressing the debate and practice on stereotyping and interdisciplinary within built environment education. From this, there are a number of key recommendations for further action:

Wider roll out of pilot study across universities nationally

Whilst this small-scale study provides some important and interesting insight into the stereotypes and perceptions held by built environment students at Kingston University, the study should be applied across a range of universities nationally in order to verify and enhance the findings to date. In particular, a wider roll out would allow stereotypes to be tested for the influence, if any, of departmental organisation (i.e. Faculty of the Built Environment v separate faculties).

Capitalising on pre-HE learning experiences

The literature review clearly identifies a great deal of potential for school level education and careers advice to shape the understanding of students prior to higher education. However, survey responses identify that this is having little influence on students perceptions. As such, it is recommended that stronger links are forged between built environment departments within HEIs and local schools/ careers advice services in order to capitalise on these opportunities. Such links could manifest in the form of simple feedback loops or in more arranged circumstances such as specific talks and visits.

Introducing: 'Alexa the Agent' and 'Peter the Planner'

Mass media clearly has a significant part to play in both the development and deconstruction of stereotypes. The recognition that characters such as *Bob the Builder* could bring about the first generation '*for a long time to grow up with a positive stereotype of constructors*' (Moore, 2001) presents the industry with monumental building block to extend such characters to other disciplines in order to promote a greater understanding of their role. It is therefore recommended that further 'ambassadors' are developed in partnership between HEIs and professional bodies. These could follow the model of *Bob the Builder* or be targeted at an various audiences, either via television or through careers literature disseminated by the professional bodies.

Deconstruct the stereotypes early

The need to tackle stereotypes early within the Higher Education process is a clear message from both the literature and survey results. It is therefore recommended that interdisciplinarity and the issue of stereotyping is explicitly addressed within the opening semester of both undergraduate and postgraduate courses. This could be achieved incorporated into the induction process through mini-projects or role playing or through the use of shared lectures/modules such as the Production of the Built Environment example presented by Edwards *et al* (2009).

Greater parity in educational models and departmental organisation

One of the contributory factors to the continued perception of professional superiority displayed by architecture students could be the radically different education model compared to other professional disciplines. The very fact that architecture is seen to be 7 years full-time study contributes to notions of higher importance and greater skill, regardless of the fact that disciplines such as surveying require a two year APC period post qualification. As such, it is recommended that work is carried out to explore potential ways of bringing about greater parity between the educational models of the constituent disciplines. In addition to this, departmental organisation has also been highlighted as a potentially significant factor in the development of interdisciplinarity and deconstruction of professional silos. For this, it is recommended that further exploration is undertaken to determine the most appropriate and effective arrangements to allow built environment professions to cluster under a single faculty umbrella.

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