



Getting In Getting On In Construction

Experiences of women and men studying
construction in Scotland

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This report describes research supported by ConstructionSkills, the Scottish Resource Centre for Women in Science, Engineering and Technology, Napier University, the UK Resource Centre for Women in SET, and the European Social Fund

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Over recent years, Kiril has been involved in a number of research projects, including 'The Policing of Racist Incidents in Strathclyde' (University of Glasgow and Strathclyde Police), 'Exploring disability disclosure amongst college and university staff in Scotland' (Scottish Funding Council), and, most recently, 'The Business Case for Gender Equality' (Equal in Scotland and Glasgow Caledonian University). Kiril has also worked for a number of grassroots organizations in Russia, Ukraine and Hungary as well as mentoring training programmes for United Nations peacekeeping personnel in Canada.

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Jenny Tizard worked in construction in Yorkshire for seven years, where she was usually the only woman on site. She taught engineering in universities and further education colleges and spent nine years working on the University of the Highlands and Islands Project.

One outcome of the research described in this report has been the development of initiatives to make the construction sector a more welcoming environment for all Scottish students. This work is being undertaken by ConstructionSkills and the Scottish Resource Centre for Women in Science, Engineering and Technology.

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Preface by ConstructionSkills director for Scotland

The construction industry is a sector that contributes significantly to the Scottish and UK economy, as well as underpinning the infrastructure that facilitates the successful operation of other skills sectors. We need greater insight into why people choose to enter and stay in a career in construction. In order to attract and retain the best recruits we have to embrace applicants from all backgrounds to ensure the sector represents society as a whole.

ConstructionSkills surveyed 2,400 girls in England aged 11 to 18 on their attitudes to the industry. 70% of the girls felt that there was gender bias against them in the careers advice they were given, despite the girls themselves being keen to break gender stereotypes. Nearly half felt their career options were limited because of their gender and, although almost two thirds would be happy to work in male-dominated industries, they do not get the advice and information they need to pursue this. ConstructionSkills actively promotes construction as a career of choice, regardless of gender, through various initiatives delivered to school pupils from primary 5 to S6 secondary school pupils.

It is of paramount importance that we understand why students chose construction and what their perception is of the varied careers offered by the industry. We welcome the research carried out through 'Getting In Getting On In Construction', which will allow us to address the needs of new entrants. It will also ensure that undergraduates are prepared for working in the industry and that the recruitment, progression and especially the retention of women in the construction industry is better understood.

ConstructionSkills is committed to implementing the recommendations in this report, which will begin with a new initiative in 2009 that involves equality and diversity training workshops. These will be co-ordinated and run in Scottish colleges and universities by our Equality Adviser, Jacqueline Kerr, and Jenny Tizard of the Scottish Resource Centre for Women in Science, Engineering and Technology. This is an innovative approach that is transferable to other skills sectors which will explore how women students can be better supported on work placements and also undertake research on gender stereotyping amongst apprentices in colleges in Scotland, and ways of addressing this.

In order to maintain a sector that serves all of the community, innovation is key and a diverse workforce that reflects society is the way forward in order to build on past successes.

Graeme S Ogilvy

Preface by ConstructionSkills equality adviser for Scotland

Whilst construction is a sector to be proud of in many areas, one where we need to make more of a positive impact in is in relation to equality and diversity. Women and people from Black and Ethnic Minority groups are under represented within the sector. To resolve the issues I was employed by ConstructionSkills in my current role in 2006 although I have worked for the organisation since 2002.

My main role is to support construction employers to progress recruitment and behavioural practices to a point where the construction sector is an attractive career choice to the best people available regardless of gender and ethnicity. The following support is available to employers within the sector to help them achieve a balanced workforce that reflects society in Scotland.

- Equality & Diversity Training Workshops
- Equality & Diversity expertise and policy advice
- Investigate complaints
- Positive Action Events
- Promotion of the sector to diverse groups
- STEP funding
- Research
- Promote the business case
- Scottish Action Plan

Most employment legislation today is based on two subject areas. One is Health and Safety and the other is Equality and Diversity. It is not a phase that will pass and this makes it important that employers within the sector are proactive and create a sector we can be totally proud of.

Jacqueline Kerr

Executive Summary

This report explores the findings of a study into factors affecting the progression of undergraduates from built environment programmes into employment in the Scottish construction industry. It focuses on the following questions:

- Why had students chosen to study and work in construction?
- How well prepared did they feel for their first job? and
- Are there issues that particularly affect the recruitment and progression of women students, in a field where they are very much in the minority?

The research was undertaken by ConstructionSkills Scotland and the Scottish Resource Centre for Women in SET, a partner of the UK Resource Centre for Women in Science, Engineering and Technology. The research was steered by Project Advisors, Jacqueline Kerr, Equality Adviser, ConstructionSkills, and Professor Brian Sloan, Director of Research & KT, School of Engineering and the Built Environment, Napier University. The support of project funders, ConstructionSkills Scotland, Napier University and the European Social Fund, made this research possible.

Context

Women play an increasingly important role in the Scottish economy: in 2006 women represented 48% of the labour force in Scotland (Scottish Executive 2007, p. 104). However, women and men are distributed differently across and within industrial sectors: 43% of working women were in part-time employment with the majority still found in low-paid and low-skilled jobs. Average full-time hourly earnings for men continued to be 10% greater than for women (ibid.).

Construction is one of the industries where women remain underrepresented in both manual and managerial positions: they make up about 10% of total employment, 2% of manual employment and 32% of non-manual (mostly administrative and support) employment (ConstructionSkills 2005, p.9). Women are also under-represented on built environment degree programmes in Scottish universities: in 2006-07 only 30% of first-degree students of architecture, building and planning, and 12% of students of engineering and technology were women (Scottish Government 2008).

Upon graduation some male and female graduates decide against employment within the sector. About 15-20% of graduates from built environment programmes in the UK are estimated to be employed in sectors other than property development and construction six months after graduation (Prospects 2007). The number of science, engineering and technology (SET) graduates continues to decrease as they mature with only a minority of all SET graduates in the UK (including graduates from built environment programmes) employed in SET occupations (40% of men and 25% of women) (Department of Trade and Industry 2002).

About the Study

This study was exploratory rather than fully comprehensive and aimed at identifying emerging trends and issues. The main sources of data for this study were (a) an online survey of students enrolled on undergraduate built environment degrees at five Scottish universities, (b) a survey of employers representing the diversity of the construction sector in Scotland, and (c) semi-structured qualitative interviews with employers.

The research was constrained by: limited time scale ruling out a longitudinal follow-up of the same cohort of students, difficulties in securing responses from some respondents, and lack of comprehensive gender-disaggregated statistical data.

The available data on female employees within the sector, and female entrants to and graduates from, Scottish further and higher education provides a set of static annual indicators at present. What the data does not reveal is the dynamics of where female employees and graduates are and when and why they enter or leave the industry. Further research would allow the construction sector to understand when and why graduates leave.

What We Found

Why did people choose to joining the Sector?

Family and friends: Families and friends played an important role in encouraging or discouraging students in their career decisions. Most students perceived their influence to be far more significant than that of schoolteachers or career advisors. About 40% of male students indicated having a family member working in construction was a positive influence. The corresponding indicator for female students was slightly lower. This shows the importance of raising the awareness of the career opportunities in construction to family members of potential entrants to the sector .

Career advice: Only half of respondents in this study found career advice they received at schools and colleges to be accurate and realistic. There would appear to be potential for improvement in the delivery of career advice. The issue of potential divergence between career advice received at school and family or peer advice received at home needs further research.

Initiatives such as Scottish Young Women in Construction Conference, and Construction Ambassador programmes, are important in building bridges to construction careers for women.

Previous experience: Positive pre-university experience of the construction sector can often be a catalyst for a decision to join a university. Although the majority of respondents in this study were under 25, about half of them had previous experience of working within the sector. This experience, however, may be one of the 'channels' through which some of the negative behavioural practices of the industry find their way into university classrooms and laboratories (see Gale 1994).

Practical experience: utility, expectations and reality

Work-related practical experience is recognised as important in making students more confident and more employable. Increasing number of employers tend to recruit from the pool of students who have carried out a work placement. Universities and employers need to make sure that a variety of work experience options, including work placements, are available and are taken up. They are especially important for women, who are less likely to have relevant experience prior to studying.

Most students perceived practical experience to be essential to their post-university employment and expected to gain such experience during their time on the programme. However, only 75% of female students and 57% of male students did. The majority of students who took up a work placement found it beneficial. However around 10% of students were disappointed and discouraged by their experience of the industry whilst on a work placement.

I think work placement should be an integral part of all degrees in the built environment discipline. Some students may not get the opportunity to gain experience during summer breaks. Through work placements they get the chance of getting out in the working environment (*Final year male student*)

My work experience was invaluable. Even in a small practice in a small town where some would think there is limited experience to be gained (*Final year female student*)

Graduate training schemes ensure that new graduates quickly become productive and effective team members. Students were keen to enter them. However, many employers thought they would be expensive to run. Guidelines and best practice should be shared on graduate training schemes, for small and large companies. 'Inspire Scholarships', the ConstructionSkills scholarship scheme, is an example of an initiative focusing on bringing the brightest and best graduates into the industry.

University experiences

The majority of female students described the atmosphere in their departments and school as neutral or women-friendly. However, about a quarter of final year female students reported feeling isolated in male-dominated group settings and being under pressure to prove themselves in everyday situations.

Lecturers and staff are very encouraging but some of the fellow male students are condescending at times especially in group work (*Final year female student*)

Sometimes I am in a class on my own. Very few men will talk to you until they are used to you (*Final year female student*)

Women cannot afford to make any mistakes as it'll be immediately obvious. Women need to be pushy and strong to succeed in what is essentially a male dominated industry (*Final year female student*)

Some of these students adopted one of the 'coping strategies' identified by Bagilhole (2006) in her research of experiences of female students of engineering. A number of female students mentioned the importance of peer-support/networks in resisting or coping with discriminatory attitudes. At Napier University, a network for female students studying built environment and other subjects with predominantly male staff and students has been set up. It provides opportunities to meet other women studying similar programmes, establish contact with women professionals as well as website and Facebook support. Following the success of this initiative, the network is being rolled out to other Scottish universities and colleges. Further information can be found at www.napier.ac.uk/connect

Gender: does it matter?

There is no consensus among students on the role of gender in career progression and success. A significant number of respondents (from around a third to two-thirds of respondents depending on the question asked) formed no opinion in relation to a divisive question: Does it matter if you are a man or a women in the built environment sector?

More female than male students believed that women must have special skill-sets to pursue a successful career in construction. At the same time, most students who agreed that women required special skills viewed such skills as individual rather than gender specific. They saw special skills as equally important for men and women: the 'special' nature of such skills had to be underpinned by professionalism and the ability to meet technical requirements of the job rather than by gender. Gender, in most cases, was perceived as irrelevant.

About half of first year female students thought that women must follow what could be described as 'male career patterns' (no career breaks and long hours of work) to succeed in a built environment career.

Most female students tended to 'idealise' the role of qualifications and personal determination in pursuing a successful career in built environment. It may be that gender-based inequality and stereotypes are so embedded that some students are unwilling to admit to encountering discrimination and prejudice on account of their gender. Instead, they identify other factors, which they perceive as gender-neutral such as, for example, lack of role models or lack of established career patterns for women.

Some male students recognised the reality of gender-based discriminatory attitudes within the industry and suggested that women needed to accept such attitudes and start acting like 'one of the boys' or 'achieve a reputation' by 'showing their worth'.

Two levels of acceptance can be identified: active, where recognition of gender-based inequality translates into daily practices and behaviour, and passive, where gender-based inequality is not endorsed or agreed to but, at the same time, is not actively challenged or resisted.

Diversity training has the potential to address entrenched gender stereotypes, which often translate into gender-based discrimination in workplace.

Students had diverse response to the questions on attitudes towards gender. These may have come from different perspectives. An essentialist perspective argues that women think and work differently from men and that these differences are biologically 'hard wired' and, therefore, are not changeable. A social constructivist perspective argues that choice, behaviour and skills occur and change within a variety of cultural and social contexts. A nuanced understanding of how students conceive of gender-based differences and gender-based inequality should inform any diversity training initiatives.

Future careers: what do students want to do and do they feel confident enough to do this?

The majority of students felt confident about their choice to join a career in construction, with the exception of female students in their first year most of whom were uncertain about their choice. By the final year the female students displayed the same level of confidence in career choice as the male students.

Most students were confident about their chances of finding employment after graduation, however not all intended to look for jobs within the construction sector. This study suggests that up to 15-20% of final year students decide against entering the sector, rebelling against its culture, which students perceived as unwelcoming, macho, gender-biased, requiring long hours and paying low wages. Such 'rebellion' against the industry culture and values might explain the initial 'leak' in the pipeline of qualified professionals where the number of female and, to some extent, male students enrolled on built environment programmes at Scottish universities does not translate into the number of women and men employed in managerial and/or professional positions within the industry.

I think the lack of women in the construction industry is mainly due to a cultural problem. There are no female role models (or few that one hears about) and most schools do not encourage potentially good female engineers to do maths, physics etc. The first step to change is to encourage women to take subjects which are more untraditional in schools. Once you're in university, you know what you're in for - that working will be a challenge due to your gender so you're more prepared to accept it. The Continent encourages women more than in the UK. We're doing something wrong (Final year female student)

In engineering, the prospects are low, pay is low and career progression only happens when someone leaves or dies. For women to fight stereotypes in such a setting would be more difficult than required. Why would they tackle a career that could easily go either way rather than choose a path that they are more stable and secure in? (Final year male student)

Somewhat unexpectedly, high levels of confidence among students about their career choice and employability did not translate into high levels of confidence about relevance of the skills they developed at the university to the industry's current employment needs. More than half of final year students were either unsure or did not think that their programmes equipped them with the right mix of skills and knowledge.

Not having the right mix of skills for future employment was not the only concern about post-university employment prospects expressed by students in this survey. Students indicated a diverse range of opinions when asked about their concerns about working in the built environment. There was a noticeable difference in the perception of potential workplace/career-related difficulties by first and final year, and male and female students.

Final year female students were more concerned than their first year counterparts about negative aspects of working in construction. Concerns about poor safety were the only exception to this- the least important area of concern for female students. Overall, final year female students were most concerned about long hours and low pay, followed by 'inflexibility', 'sidelining' and 'parenthood'.

By contrast, final year male students were less concerned than their first year male counterparts about almost all categories apart from 'long hours' and 'poor working environment'. 'Macho culture' was the least concern for final year male students, followed by poor working environment and parenthood. Overall, final year male students were most concerned about 'long hours', followed by 'low pay' and 'no scope for creativity'.

Students were also asked what attracted them to working in the built environment. There were clear differences in the responses of first and final year female students with first year students being more positive. The difference is most noticeable in the following categories: 'working as a team', 'career progression opportunities' and 'pay and benefits'. These are all key dimensions affected by the availability and promotion of gender equality in the workplace. Final year male students were more positive about working in the sector than first year male students. Decreasing attractiveness of the sector to some final year female students and increasing attractiveness to some final year male students may demonstrate the impact of the 4-year engagement with the construction culture which takes place within university departments and work placement environments.

What should be done?

Students were asked for suggestions what could be done by employers, universities and professional organisations to encourage students to 'get in, get on and stay on' within the built environment sector. The overarching message from students is: It is in the interest of employers, universities and professional organisations to try and get the best talent to work in their industry.

Students' suggestions for Employers:

- Provide more placements;
- Visit universities;
- Provide graduate training/mentoring schemes;
- Work with school children/colleges students.

Students' suggestions for Universities:

- Help students with/organise work placements;
- Work in partnership with industry/support students through partnership with employers;
- Work in partnership with schools and colleges;
- Provide more student support.

Students' suggestions for Professional Organisations:

- Organise more awareness campaigns;
- Provide more student sponsorships and work placements

1. Key messages and recommendations from the research

The young people studying on built environment courses at Scottish universities are positive about women entering the construction industry. They felt women could offer new perspectives and new ways of working. Most students did not see any problems with this, as they said, 'It's 2008!' Employers whom we contacted agreed with this.

Women coming to work in the sector will be very much in the minority. Currently, only 13% of the workforce are women (ConstructionSkills 2008, p. 10), and only 20% of new graduate entrants are women¹. This research suggests that changing the culture of the industry so that it is welcoming to new entrants, male and female, and makes the best use of their skills, requires a partnership approach from employers and universities.

Recommendations

1. Families and friends are strong influencers on career choice. To attract more women into the sector, it is necessary to communicate to potential applicants, their friends and families a positive image of the sector and the range of opportunities available. Targeted positive media coverage is needed. Women may be particularly attracted by an opportunity to design an environment that will improve people's lives (see pp. 14-18). The construction industry should consider how to target parents and promote the sector as a viable career choice for men and women.

Initiatives such as Scottish Young Women in Construction Conference, and Construction Ambassador programmes are important in building bridges to construction careers for women.

2. Work placements are recognised as being very important in making students more confident and more employable. Universities and employers need to make sure these are available and are taken up. They are especially important for women, who are less likely to have relevant experience prior to studying. However, a bad placement experience of can turn someone off a career in the sector. Universities and employers need to ensure students are prepared for placements and supported on them. Employers recognised that supporting work experience was a significant step they could take that would help them to address skill shortages (see pp. 18-23).

Employers and universities should share guidelines and best practice on supporting student placements and work experience programmes.

3. Graduate training schemes will ensure that new graduates quickly become productive and effective team members. Students would be keen to enter them. Employers in this study perceived graduate training schemes as expensive to run and requested advice and information on how to set them up. Graduate training schemes would benefit women and men entering the sector, and would address some of the issues that employers raised about the lack of skills of new entrants (see pp. 18-23).

Guidelines and best practice should be shared on graduate training schemes, for small and large companies. 'Inspire Scholarships', the construction industry's leading scholarship scheme, is an example of an initiative focusing on bringing the brightest and best graduates into the industry.

4. Women coming into the sector may be fairly isolated and may feel under pressure to continually prove themselves in everyday situations. Role models and mentors can help to reduce the isolation of women entering universities and the industry (see pp. 23-25).

Universities and employers should consider how new entrants can be encouraged through contact with successful role models. The Association of Women In Property (WiP), with over 300 members in its Central Scotland branch, provides a strong networking organisation for women in a variety of construction-related jobs. The WiP organises regular networking activities, ambassador work with schools, awards for female students and a mentoring programme².

¹ Based on 'Graduates from higher education courses in Scotland by subject of study: 1996-97 to 2005-06' available from www.scotland.gov.uk/Topics/Statistics/Browse/Lifelong-learning/DataG4 (published in October 2007)

² For more information see www.wipnet.org/

5. Setting out to recruit more women needs to go hand in hand with more support for the women who are studying and working, and a commitment from executive levels and management to challenge sexism and the industry's culture which has traditionally been male-dominated. Family-friendly policies, now required by legislation, are needed to create the modern workforce (see pp. 25-33).

Examples of good practice in family friendly policies in the sector need to be developed and shared. Equality and diversity training plays an important role in challenging attitudes and influencing culture.

6. Students perceived the Built Environment curriculum as being not up-to-date with workplace practices. They felt that closer co-operation between Built Environment departments and companies would enrich programmes of study, as well as increase student employability (see pp. 33-42).

2. Introduction

This study was undertaken to explore issues affecting the progression of final year students of the built environment in Scotland into employment. In particular, it focused on the following questions:

- Why had students chosen to study and work in this sector?
- How well prepared did they feel for their first job? and
- Are there issues that particularly affect the recruitment and progression of women students, in a field where they are very much in the minority?

There were two partners to this research: ConstructionSkills, responsible for workforce development in construction in Scotland, and the Scottish Resource Centre for Women in Science, Engineering and Technology (SET)³. Both identified the need to explore what was happening to women studying built environment in Scotland.

This research engages with current debates on gendered labour relations in the context of the construction sector in Scotland. Informed by considerations of gender equality and employability, it offers a perspective on a continuing reconfiguration of the industry and implications of this reconfiguration for the industry overall, its current and future employees, and users of the built environment. A key thematic area concerns the intersection between gender, as a domain of economic and political power, and employability within the sector influenced and shaped by changing economic, demographic and social contexts.

Women's experiences of the construction sector are not immune from institutional, economic, political and cultural shaping. Every aspect of women's entry, progression and exit from the profession is directly or indirectly influenced by cultural norms, values and expectations, economic and political developments. These span from the most specific and individual examples of peer/family support or discouragement at various stages of career entry or progression, to the level of global and national economic and political trends with, for example, a global 'credit crunch' affecting the volume of housing developed.

The processes of women's entry and progression in the construction industry are not a single-dimensional gender-defined phenomenon. These processes are mediated through a variety of 'identity characteristics' - such as ethnicity, class, age, ability - of which gender is just one. Therefore, this research offers just a glimpse into a specific context in an attempt to contribute to the overall goal of promoting greater equality within the sector and Scottish society.

Methodology

A Research Advisory Group was established to guide the project design and its implementation. The Group included Jacqueline Kerr, Equality Adviser, ConstructionSkills, and Professor Brian Sloan, Director of Research & KT, School of Engineering and the Built Environment, Napier University.

A literature review was conducted that resulted in a bibliography and synthesis of relevant literature presented throughout this report. The statistical data for this study was mainly collated from the data provided by the Higher Education Statistical Authority (HESA), the Scottish Government, the Scottish Funding Council and ConstructionSkills. There is inadequate statistical data on women's representation in the Construction sector in Scotland: details are not easily available on where women are within the sector, how long they stay and how they progress. Similarly, this information is not available on women's representation on built environment programmes in Scottish further and higher education (FE and HE). Overall, such information/data gaps significantly complicated the research process⁴. The inadequacy of the available statistical data might signify, in general terms, insufficient attention by policy-makers to the issue of women's under-representation within the industry and the built environment disciplines in higher education. It is worth mentioning that prior to 1990 little attempt was made by academics to explain the under-representation of women in the male-dominated construction sector (Fielden 2000, p. 114).

The research data for this study was collected in the form of questionnaires and semi-structured interviews. The main research vehicle was an online questionnaire/survey. There were two sets of

³ For more information see the website of the Scottish Resource Centre www.napier.ac.uk/src

⁴ The quote by Hilary Rose (1999) referred to in Kay (2001, p. 7) rings true in this context: 'No data, no discourse, no problem'

questionnaires: one aimed at first and final year students of the built environment in Scottish Universities, and another aimed at a number of employers within the sector.

With the help of ConstructionSkills Scotland, a number of construction companies were invited to complete a paper-based survey focusing on employers' perspectives on graduates' employment within the sector. Interviews were conducted with a sample of these respondents.

The student survey was open to students of the built environment at five Scottish Universities and was carried out in November 2007 - January 2008. Programme organisers in the relevant departments were asked to circulate the survey among first and final year students. One hundred and fourteen students completed the survey, of whom thirty-three were female. Further information about the respondents can be found in Section 9.

The main constraints faced in this research included: limited time scale ruling out a longitudinal follow-up of the same cohort of students; difficulties in securing responses from some of the built environment schools and from students; lack of comprehensive gender-disaggregated statistical data.

Representation and validity

The student survey was self-nominating and voluntary: firstly, by university programme organisers as 'gate-keepers' to students, and, secondly, by students themselves who exercised final authority in making decisions about completing the questionnaires. It should therefore be considered as exploratory, aiming to identify emerging trends and issues, rather than being fully comprehensive and representative.

Students' voices

In writing this report we have quoted from the respondents extensively. Our intention is to let the voices of men and women entering the industry be heard by decision-makers.

3. Choosing a career in the built environment

What are the key influences?

Respondents were asked to indicate their experience of discouraging or encouraging attitudes towards their decision to study on a built environment degree course. For this question, respondents had a choice of the following 5 options: **family, friends, career advisers, teachers and other** (open-ended). The majority of students were encouraged in their career decision-making. 'Family' was the most encouraging factor for all students in this survey (see Chart 1).

Male respondents were more likely to be encouraged than female students; whilst female respondents were more likely to be discouraged from joining the built environment programmes.

First year female students: a minority were discouraged equally by family and friends (11%), followed by career advisors and teachers (5%). This group of students received most encouragement from family, followed by friends, teachers and career advisors.

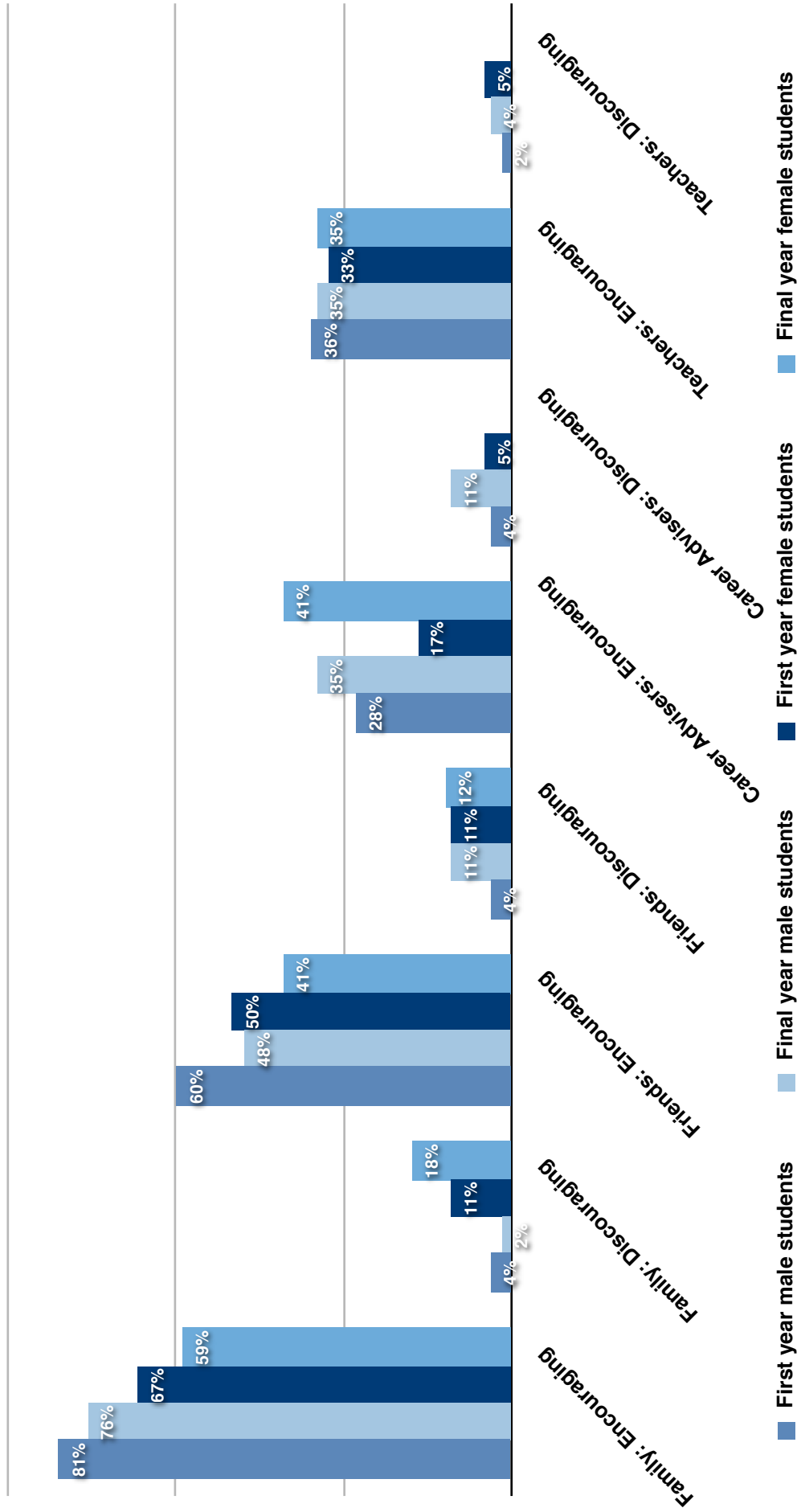
Final year female students: expressed views similar to those of their first year counterparts: family (18%) and friends (12%) were described as the two most prevalent discouraging influences with the majority being encouraged by family, friends and career advisors.

This study focused on students already enrolled on the built environment courses; identifying and surveying students who were discouraged and decided not to enrol on such courses fell outside the scope and remit of this study.

The relatively high frequency of responses with a mention of friends and family influences suggests that these play a significant role in career decision-making. This finding echoes the one by Thomson et al. (2005a, p. 9) that informal networks can be more important than formal mechanisms of career advice.

The influence of parents on career choices of school-leavers was noted by the 2007 ConstructionSkills survey 'Positive Influence? A report into parents' attitudes to their children's career choices' (2007a). This survey was undertaken as a part of the 'Positive Image' recruitment campaign, which promoted the range of careers on offer in the modern industry. The survey revealed that parents generally rated university as the most valuable educational path for their children to follow; 86% of parents would be proud if their child chose a career that wasn't stereotypical for their gender (ConstructionSkills 2007, p. 8).

Chart 1: Encouraging and discouraging attitudes: by group

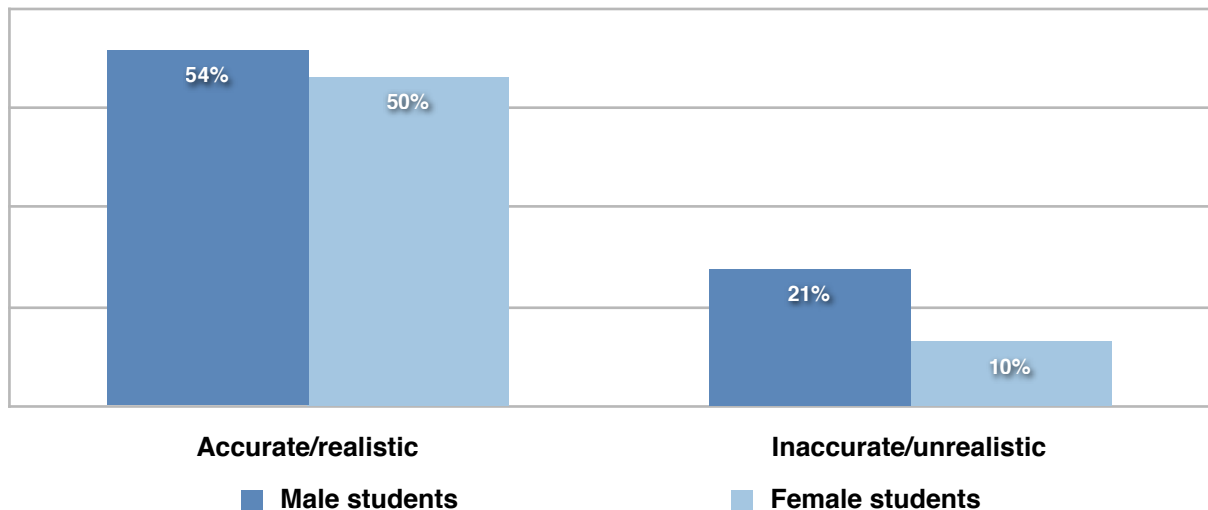


It is suggested that to recruit more people, it is important to communicate the benefits, attractiveness and the availability of opportunities within the sector to families as well as young people themselves.

How effective was career advice?

Final year students were asked to comment on the effectiveness of career advice they had been given before joining the programme. The majority indicated that career advice was accurate and realistic (50% of female students and 54% of male students); 21% of male students found it inaccurate, as did 10% of female students.

Chart 2: Effectiveness of career advice



These findings are those of students already enrolled on one of the built environment courses. They do not include views on the effectiveness of career advice by students who could have been enrolled on such courses but decided against a career in the built environment as a result of discouraging career advice. This might explain a generally positive/neutral response to this question in the light of a more negative assessment of career advice in other studies. Research carried out by the Equal Opportunities Commission (EOC) into sex segregation in training and work (2005) shows that many girls who had been interested in non-traditional occupations when younger were discouraged or unsupported by teachers and career advisers when at school or in further education.

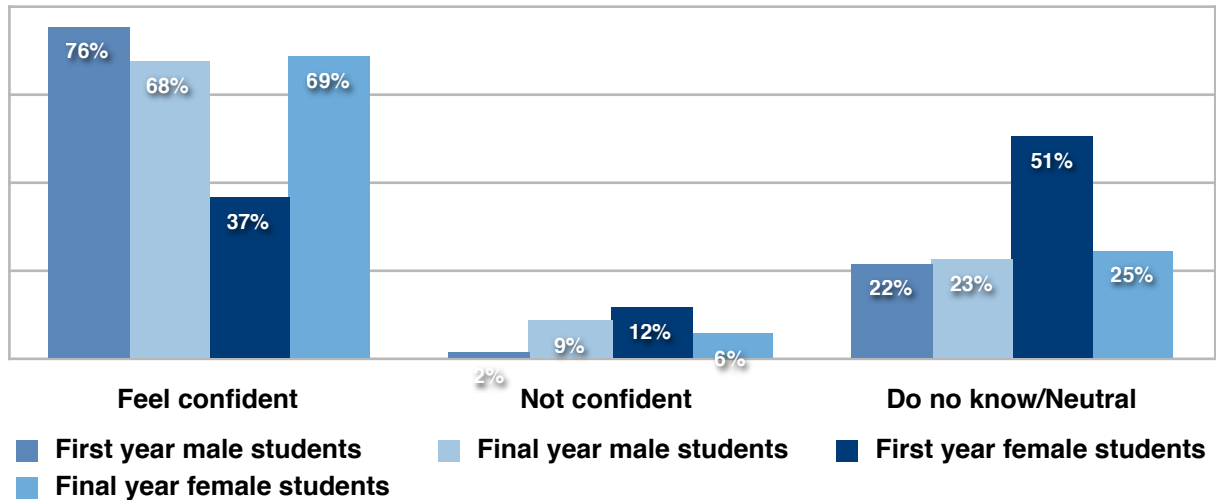
The quality of career advice provided at schools has been the subject of a number of studies, including research by ConstructionSkills (2006). It found that about 70% of girls (aged 11 to 18) claimed that careers advice they received at schools was gender-biased and sought to put them off traditionally male-dominated industries; 31% had been discouraged from studying certain disciplines because of their gender (ConstructionSkills 2006). Almost two-thirds (62%) of 11-18 year old girls in the ConstructionSkills' study would be happy to work in male-dominated industries but did not get the advice and information they needed (ibid.).

One example of a successful initiative organised by ConstructionSkills Scotland, is an annual 'Young Women in Construction' conference. Open to girls aged between 15 - 18, the conference provides an insight into various career opportunities that exist within the construction industry. The 2008 Conference was hosted by Glasgow Caledonian University. Advertised through the social networking website www.bebo.com (along with more conventional posters and flyers), the Conference provided girls with an opportunity to speak to different employers and meet other young women interested and/or employed in construction.

Had they made the right choice?

Both first and final year students were asked about their confidence in the choices they made about joining a built environment programme. The majority of respondents from all groups felt confident about their choice.

Chart 3: Making the right choice - feeling confident about the chosen course



First year male students demonstrated the highest level of confidence, followed by final year students, male and female.

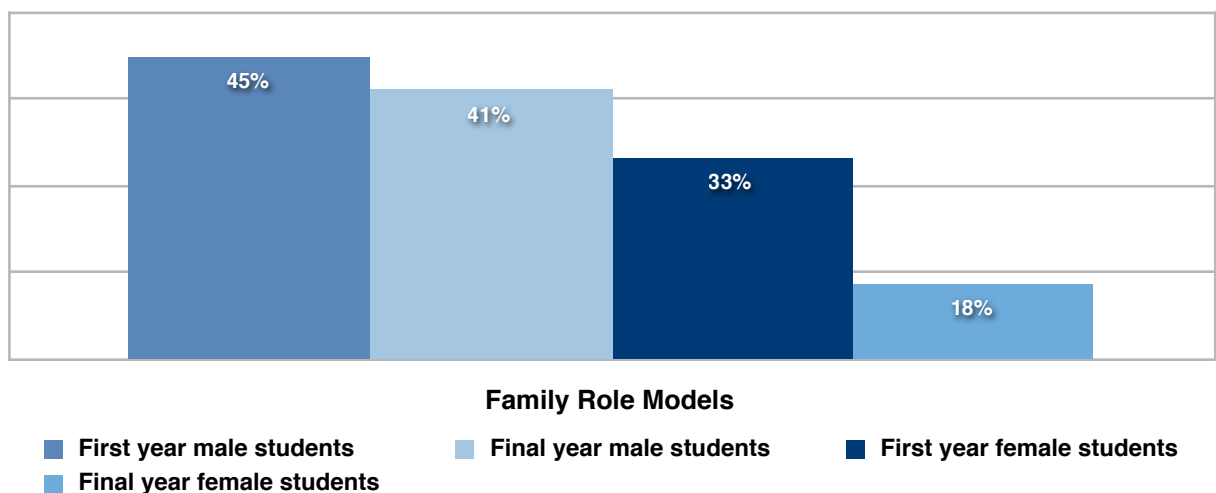
A minority of students from each of these groups expressed a lack of confidence in their choice of the programme: uncertainty was more marked among first year female students (12%) than first year male students (2%). Nearly half of first year female students did not form a definite opinion on the issue.

Most students, apart from first year female students, were confident about their career choices. First year female students expressed significant levels of uncertainty in comparison to male students. This confirms research elsewhere (Faulkner 2006) on an early confidence loss experienced by some female students entering male-dominated environments.

Did they have family role models?

Given the importance of family attitudes on career choices made by school/ college leavers, the survey explored the potential influence of family role models on students' career decisions. Respondents were asked to identify whether any of their relatives had any work experience within the built environment sector.

Chart 4: The availability of family role models



Female students, especially those in their final year, were less likely than male students to report having family members working within the sector.

Family are very supportive of my studies but think I'm mad to work in construction (Final year female student)

I am the first family member (immediate and extended) to choose a career in the built environment but this lack of shared experience hasn't been off-putting (Final year female student)

I was supported by my mum (First year female student)

Nobody in my family has been to university before and nobody has worked within the built environment (First year female student)

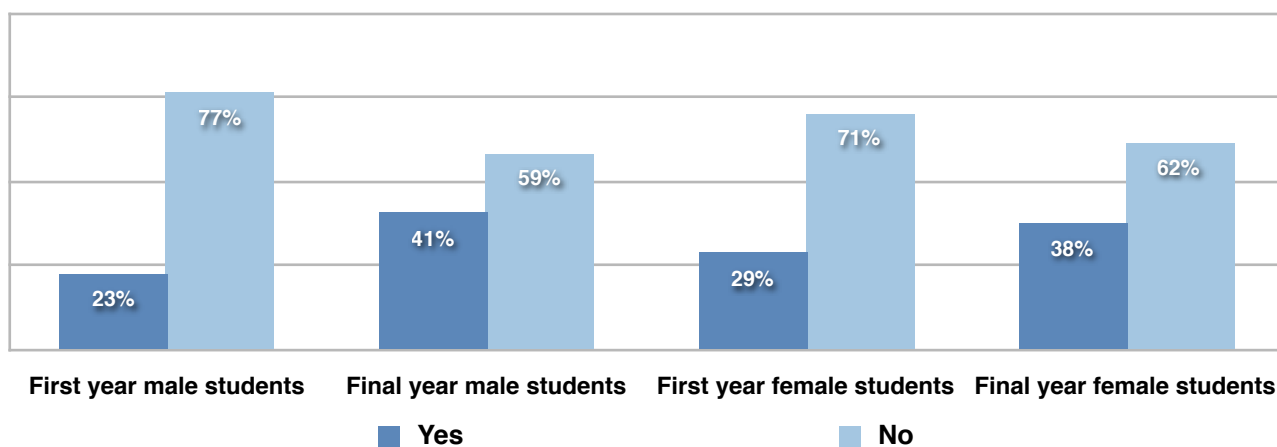
Recommendation 1. Families and friends are strong influencers on career choice. To attract more women into the sector, it is necessary to communicate to potential applicants and their friends and families a positive image of the sector and the range of opportunities available. Positive media coverage is needed. Women may be particularly attracted by an opportunity to design environments that will improve people's lives.

Initiatives such as Scottish Young Women in Construction Conference⁵, and Construction Ambassadors programmes⁶, are important in building bridges to construction careers for women.

Did gender influence career choices?

Did gender influence students' career choices? The majority of students disagreed.

Chart 5: Gender influencing career choice



Final year students were more likely to agree than first year students.

The majority of students disagreed that the process of making decisions about their future career was influenced by their gender.

Some of the quotes by final year male students reflect somewhat narrow-minded thinking and gender-biased attitudes (see below). In discussing the potential attitudinal differences between older and younger male construction professionals, Shanmugam et al. (2006) refer to research by Gale (1994) which found that young male professionals could be equally as narrow-minded as their older counterparts. Shanmugam et al. (2006) argue that the possibility of implementing an open minded culture within the sector is 'very slight' unless such stereotypes and discriminatory attitudes are challenged at an early stage of professional development.

⁵ For more information see www.bebo.com/ywic

⁶ For more information see www.cskills.org/supportbusiness/trainingandassessment/constructionambassadors/index.aspx

Stereotypical views expressed by male students on men's and women's roles:

Couldn't do a girlie job - I'm male (*Final year male student*)

I'm a guy – I'm going to be an engineer! not a nurse! (*Final year male student*)

I'm sick of all this XXX about woman (*First year male student*)

Stereotypical views expressed by male students on women's career aspirations:

I could be wrong but I think a lot of women prefer continue their studies so as to achieve a more comfortable working environment such as teaching, whereas men are happy to work on construction site more so than women!! I could be wrong (*Final year male student*)

There are not enough women on the construction side of the industry with most appearing to choose the consultancy option as it is deemed to be 'safer', less male dominated (*Final year male student*)

Females can be on the course but reality they don't want a workshop job the job they want is in a board room (*Final year male student*)

As women only need to earn money and want simple easy life they do not need to be on shop floor (*Final year male student*)

Reflection by male and female students on the influence of stereotypical views of men's and women's roles:

Programming from early age - dolls for girls, cars for boys - will carry on to later age and job aspirations (*Final year male student*)

There are definitely areas of work which, when choosing to return to study, I would have immediately discounted due to the perceived gender role involved - i.e. healthcare, retail...whether I was interested in them or not. Therefore, I assume an element of this must be similar for females (*Final year male student*)

Simply because of stereotypical situations, men as nurses is not attractive to some men and women as builders is not attractive to some women (*First year male student*)

Some jobs are seen as manly, other jobs are seen as feminine. It is difficult to cross that line without discrimination and ridicule (*First year male student*)

4. Practical experience and work placements

Did they have previous experience in the sector?

Having previous 'hands-on' experience of work in the built environment is one of the factors influencing students' career choice. Although the majority of respondents were under 25, about half of them (40% of female and 50% of male respondents) had previous experience of working within the sector. This suggests the importance of work experience for school/college leavers who might consider a career in the built environment sector.

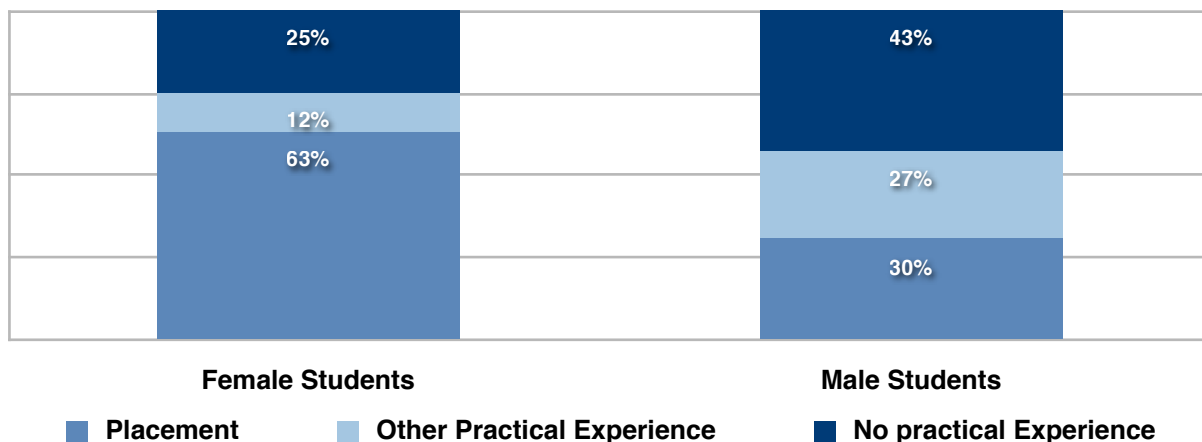
Work experience allows individuals to make a decision informed by some experience and engagement with the industry. This may go beyond the practical or technical experiences of carrying out the functions of a particular job and extend also to an immersion into the industry's culture and values. This engagement, which takes place before students enter higher education, may influence the attitudes and behaviour that are brought into classrooms or laboratories. The 'acceptable' codes of behaviour in built environment departments are linked to those of the construction industry (Gale 1994, p. 8). The influence of the construction industry values and culture on students' experiences of higher education and career progression are further discussed in Section 7.

Most respondents agreed that gaining practical 'hands-on' experience was important for securing their first job on graduating. There was no significant difference between male and female students' perception of the importance of such experience.

About 50% of respondents did not have any experience of the built environment prior to enrolment on their course. The majority of students (around 80% across all groups) anticipated gaining practical experience during their time on the programme.

Overall, the majority of final year respondents had gained practical experience as a student. This was more true for female students (75%, including 63% who undertook a placement) than male students (57%, including 30% who undertook a placement).

Chart 6: Students gaining practical experience as a part of their course



Overall, students believed that practical experience would help them gain their first job. The majority of students expected to gain experience whilst on the programme, however not all of them did

Students reflecting on the importance on practical experience:

Yes, I think work placement should be an integral part of all degrees in the built environment discipline. Some students may not get the opportunity to gain experience during summer breaks. Through work placements they get the chance of getting out in the working environment *(Final year male student)*

From the outset I was informed that no formal work experience would be given. Now that I am nearing the end of the course, I would say that it would be very important to gain some *(Final year male student)*

I have managed to gain a good amount of experience while studying, however the majority of my year have still very little to no experience of the industry. I definitely believe there should be a workplace based module or semester as part of the course *(Final year male student)*

Part-time studies, along with part-time employment is essential for a fully rounded graduate. There should be no other route available, otherwise graduates still require massive amounts of training post degree *(Final year part time male student)*

I expected to have had more site visits during my course but have not had any. I did however go on a six month full time placement for the entire semester A of 3rd year *(Final year male student)*

Students reflecting on the importance on practical experience (continued):

In my work placement experiences I had gone to industries with nearly zero practical knowledge and because of that there was a lot a problems for me; that is why practical hands on experience is necessary *(Final year male student)*

Work placement enabled me to see how a private practice works and how a surveyor can be involved in many different aspects of work. I was also able to see how to work professionally and how to communicate with clients *(Final year male student)*

My work experience was invaluable. Even in a small practice in a small town where some would think there is limited experience to be gained *(Final year female student)*

I have work, but finding employment is very tough if you don't have experience *(Final year female student)*

Hope to make a good enough impression on placement which will hopefully lead to a job offer *(First year male student)*

Students reflecting on the importance of practical experience in relation to the course content:

I expected to have more experience that would be of use to an employer, I feel the course is more of a 'pass' than learning actual skills (*Final year male student*)

I think that you learn a lot more from work. I feel that the lecturers sometimes cannot be bothered to make the effort if you are struggling and if it wasn't for a piece of paper that could further my career I'd see the university as a complete waste of time (*First year male student*)

There should be more practice-based subjects to reflect what actually happens in the work place (*Final year male student*)

Did they undertake work placements?

30% of male and 63% of female final year respondents had undertaken a work placement. The majority found this experience useful (90% female students and 77% male students). However, 13% of female and 10% of male respondents identified work placement experiences as a discouraging factor. A female respondent linked her negative experience of work placement to her gender and, as a result, decided to move from a 'site-based' to an 'office'-based course/occupation:

[Negative work placement experiences] prompted my change of course from building surveying to property management - I did not want to work in a sector where I would be fighting the women's rights corner everyday (*Final year female student*)

Both students and employers in this survey acknowledged the significant value of practical 'hands-on' experience gained by graduates as a part of their degree. A survey of 927 firms by the Construction Industry Council found that about one-third of companies believed that the quality of graduates from construction-related HE courses had fallen (ConstructionSkills 2004b, p. 106). Under-skilled entrants to the sector require additional individually-tailored and costly training and development to bring their knowledge and skills to the 'work-ready' level. Health and safety, and business sense are two skills often reported to be in short supply (ConstructionSkills 2004b, p. 69). In this light, an increasing number of employers tend to recruit from the pool of students who underwent a placement and demonstrated their suitability for a particular job. Larger companies were in the best position to implement this, since they had financial and human resources available for the administration of work-based learning schemes (Yorke and Knight 2005, p. 17).

Breitenbach and Wasoff (2007, p. vi) note that women (across all industries) are more likely than men to benefit from work-related training. Employers' willingness or ability to offer work placements, provide stimulating and supportive environment, and women-friendly work practices inform the dynamics of women's recruitment and retention in such sectors. More work could be done to make work placements clear of gender bias and available to every student of the built environment.

Work placements and graduate training programmes: employers' perspectives

The majority of employer respondents (70%) believed that individual employers should be more proactive in encouraging university graduates to pursue careers in construction. Nevertheless, only 55% of the companies provided work-placement for students; 36% of those that did not said they were willing to offer student placements in principle. The majority of employers believed that universities and professional organisations (84% and 70% respectively) should be playing a more proactive role in encouraging and supporting graduate recruitment within the sector.

Employers' perspectives:

Importance of practical experience

I don't see how anybody could possibly leave any university course without doing some kind of experience. If you're doing a three-four year course you have to learn to apply some of that knowledge: the world out there is totally different from sitting in a class.

There is a difference between universities and building sites: those who know more about the day-to-day working are going to be better equipped.

If they come to me for an interview, what would really impress me is that every summer they got a job in the building trade.

Students organising their work experience:

College and universities having to find placements for students is mollycoddling to a certain degree. Just handing it to them will not teach them to get out in the real world and get a job during the summer.

The culture in here is that everybody is busy, busy, busy: there is no room for 'baby-sitting'. People have got to come in, get inducted and take care of themselves (within the rules, of course).

The university departments do it quite well in terms of putting the responsibility on the student to find a placement which is exactly what they would have to do in business anyway.

Importance of role models and career advice

To attract more employees you have to engage with people! You have to go in [to schools, universities] on a lunchtime, get the sandwiches up and get the brightest students in, engage with them using all the senses.

It's quite important for kids to see young men or women working in construction. I would bring [to career events] someone who could talk about the salaries that they could expect, career opportunities, training programmes. I would also bring along the graduate who would be a couple of years older who would talk to them. You've got to engage people.

We ran a full apprenticeship information day to show children at school exactly what this [construction] job involves and what they would be doing. For girls to come to that would be a benefit because if they don't look into the industry they will not know whether they want to do it or not!

Working closer with universities

We enjoy linking up with universities. Although we are limited in what we can offer at the minute in terms of graduate places, we are happy to do that, happy to get involved with anything even if it is to come along and talk to a bunch of undergraduates - I'm quite happy to do that.

The majority of employer respondents had never run a graduate training programme (85%). The reasons given for not doing so were that they did not have enough information (50%); were not sure how such programmes could benefit the company (30%), and did not have human resources available for such initiatives (20%). However, 60% expressed interest in running such a programme. External financial assistance (similar to the support available for the Modern Apprenticeships programme) would encourage them to organise and run such programmes once the business need for and cost-effectiveness of such programmes were established.

Employers' perspectives: Graduate placements and training programmes

We have a graduate trainee programme which we introduced last year. We are paying out a lot of money to consultants. To minimise costs we decided to put a graduate on a competency based programme.

If we had a graduate who wanted to come on a graduate programme, regardless of whether they are female or male, they would go through the same process – we would assess their progress against competency but not on the basis of gender

The role of graduate placement? It works from both sides: the person doing it gets a bit of experience and we get to find out what someone's like, if they're good the chances are they'll get offered a job.

Graduate training programmes may be perceived to be expensive. I know quite a few small and medium sized businesses which without a graduate programme still manage to attract the people that they want to work for them so is there a need for a graduate management programme? Perhaps in some form.

Recommendation 2. Work placements are recognised as being very important in making students more confident and more employable. Universities and employers need to make sure these are available and are taken up. They are especially important for women, who are less likely to have relevant experience prior to studying. However, a bad experience of a placement can turn someone off a career in the sector. Universities and employers need to ensure students are prepared for placements and supported on them. Employers recognised this as a significant step they could take that would help them to address skill shortages.

Employers and universities should share guidelines and best practice on supporting student placements and work experience programmes.

Recommendation 3. Graduate training schemes will ensure that new graduates quickly become productive and effective team members. Students would be keen to enter them. Employers in this study perceived graduate training schemes as expensive to run and required more advice and information. Graduate training schemes would benefit women and men entering the sector, and would address some of the issues that employers raised about the lack of skills of new entrants.

Guidelines and best practice should be shared on graduate training schemes, for small and large companies. 'Inspire Scholarships'⁷, the construction industry's scholarship scheme, is an example of an initiative focusing on bringing the brightest and best graduates into the industry.

5. Friendliness of the university department

Is the university department women-friendly?

Female students were asked whether their departments was 'women-friendly'. The majority (94%) described the atmosphere as either neutral or women-friendly.

About 25% of final year female students reported experiencing problems due to their isolation in male-dominated group settings. First year students were less likely to report difficulties.

Coping strategies adopted by women in male-dominated environments have been the subject of much interest in recent years. Recent research by Bagilhole (2006) identified five coping strategies, or five 'As, adopted by female engineering students undertaking work placements. These were 'Acting like one of the boys', 'Accepting gender discrimination', 'Achieving a reputation for competence', emphasising 'Advantages over disadvantages', and adopting 'Anti-woman' approach' (ibid.) Overall, the responses of female students in GIGOCON study fitted the five 'A' strategies identified by Bagilhole:

⁷ For more information see www.cskills.org/supportbusiness/newrecruits/scholarships/

'Accepting gender discrimination' and/or attempting to justify discriminatory behaviour:

Lecturers and staff are very encouraging but some of the fellow male students are condescending at times especially in group work. They tend to be the ones who want to be army engineers though so it could just be in their nature to be so sexist (*Final year female student*)

Sometimes I am in a class on my own. Very few men will talk to you until they are used to you. This can take several weeks (*Final year female student*)

I think that women need to have thick skins and get over the idea that this is a man's world (*Final year female student*)

'Achieving a reputation for competence' - overcoming discrimination and prejudice by demonstrating superior knowledge and skills:

No isolation but the girls seem to group together generally. There is a huge number of boys who sit together who are dubious of us but on the most part, the other 75% of the boys on the course are friendly and treat us no different. In fact, some even realise that we're on higher grades than them so respect us (*Final year female student*)

The construction industry is perceived as a man's world, so women need to work harder to be respected / recognised (*First year female student*)

If a woman wants to go into contracting, then I think that she needs to be able to handle a masculine environment. A consultancy based job is completely different and often a lot more neutral (*Final year female student*)

I agree that women cannot afford to make any mistakes as it'll be immediately obvious. Women need to be pushy and strong to succeed in what is essentially a male dominated industry (*Final year female student*)

People in the industry (men) expect less of women, it scares them when they realise we are intelligent (*First year female student*)

'Adopting an 'anti-woman' approach' - criticising female colleagues who adopt 'feminine tactics' or complain about discriminatory attitudes:

The girls are very cliquy - I do not think this is a reflection of the working world. I would say that I get on better with some of the boys as they are more laid back (*Final year female student*)

A number of female students also mentioned the importance of peer-support/networks in resisting or coping with discriminatory attitudes. At Napier University, a network for female students studying built environment and other subjects with predominantly male staff and students has been set up. The forum provides opportunities to meet other women studying similar programmes, establish contact with women professionals as well as website and Facebook support. Following the success of this initiative, the network is being rolled out to other Scottish universities and colleges. Further information can be found at www.napier.ac.uk/connect

Gender balance within university departments

Most students said that it did not matter whether a lecturer was male or female. About 50% reported having at least one female lecturer. Final year students were more likely to be in favour of having more female lecturers (26% male and 31% female students). A number of students commented that having more female lecturers would provide role models not only for female but also for male students.

I've had only one female lecturer who was a scientist. Wouldn't mind having a female lecturer as long as she was inspiring. The scientist was not (*Final year female student*)

There is a female lecturer, takes a class on professional development, this is not relevant to construction so I would say there is none on the course, but it doesn't really matter (*First year female student*)

Gender should not be an issue; skills for doing the job should be the criteria. Some lecturers just don't have them...(*Final year male student*)

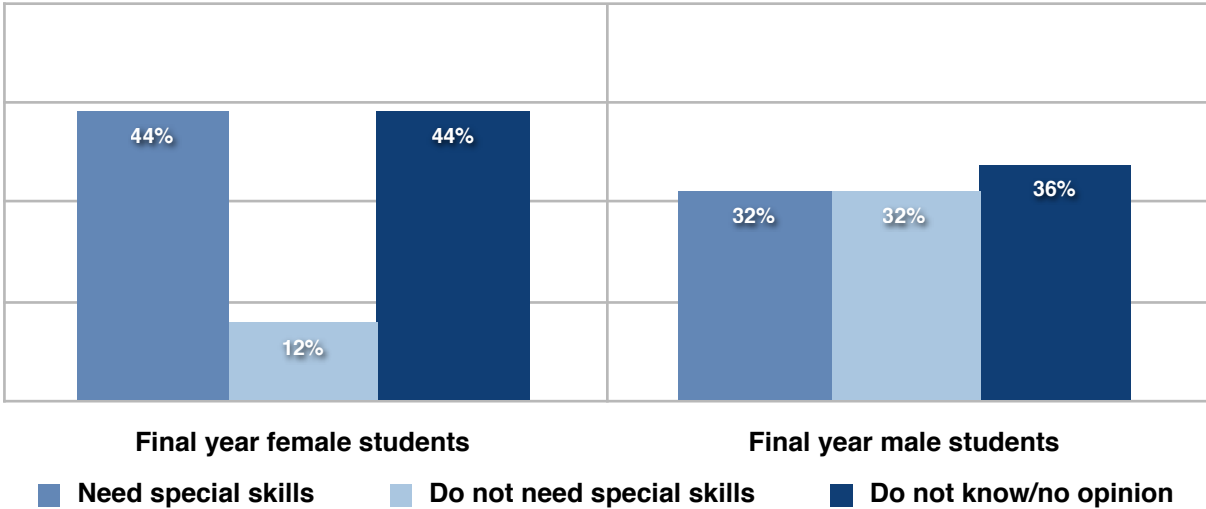
Recommendation 4. Women coming into the sector may be fairly isolated and may feel under pressure to continually prove themselves in everyday situations. Role models and mentors can help to reduce the isolation of women entering the industry and studying.

Universities and employers should consider how new entrants to the sector can be encouraged through contact with successful role models. Women In Property, with over 300 members in its Central Scotland branch, provides a strong networking organisation for women in a variety of construction related jobs.

6. Attitudes towards women working in the built environment

Students' perspective

Chart 7: Do women need special skills, knowledge or abilities?



More final year female students than male students (44% and 32% respectively) believed that women did require special skills or knowledge to pursue a successful career in built environment.

Final year male students were more likely than final year female students to express the view that women did not require special skills (32% and 12% respectively).

Of those students who agreed that women required special skills to succeed within the industry, the majority said that special skills were equally important for men and women; i.e. the 'special' nature of such skills had to be underpinned by professionalism and the ability to meet technical requirements of the job rather than by gender, which respondents, in most cases, perceived as irrelevant:

I disagree slightly with the implication of 'special' skills - any engineer needs to be fully competent and capable. *(Final year female student)*

Man or woman, everyone needs special skills, knowledge and abilities - gender should not be important *(Final year male student)*

I agree that special skills are needed for a career in built environment but not more so for women than men *(Final year female student)*

Each individual whether male or female has different skills to offer *(Final year female student)*

Women should require the same skills as men *(First year male student)*

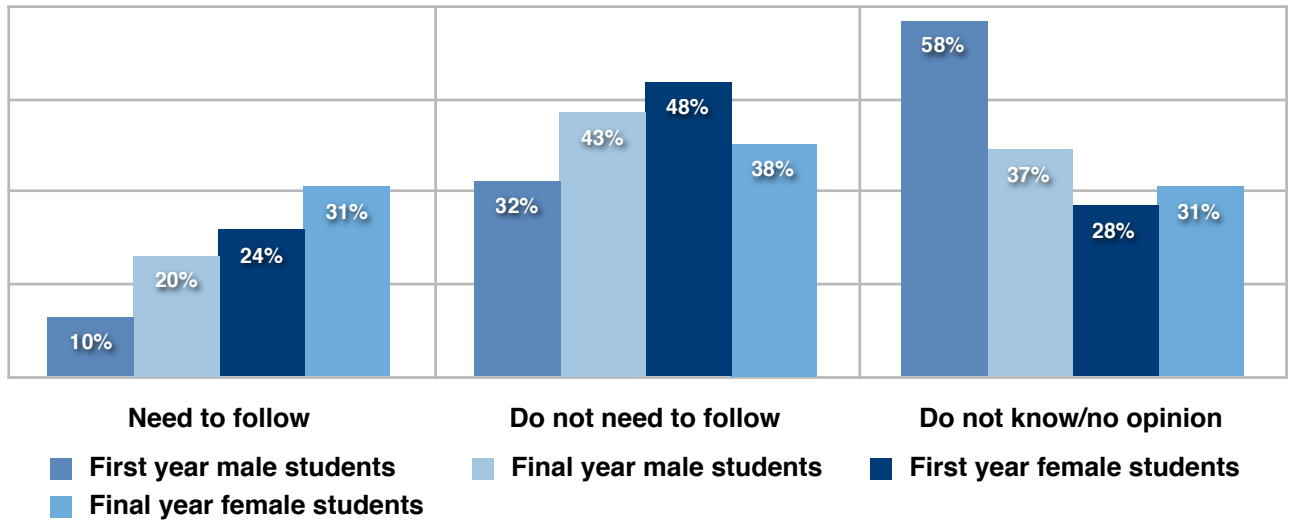
Even though men and women think differently, I think there is a place for both in Engineering *(First year male student)*

Like anybody, you have to be taught the skills, knowledge and abilities; it doesn't matter whether you are male or female.

Should be the same as men *(First year female student)*

One female respondent differentiated between what might be described as ‘soft’ and ‘hard’ skills, emphasising the need for female professionals to have a specific set of ‘soft’ skills which would enable them to overcome prejudice in the workplace and handle ‘overbearing men’.

Chart 8: Do women need to follow male career patterns in order to succeed in a built environment career?



First year female students and final year male students were the most likely groups to disagree with the statement that women needed to follow male career patterns to succeed within the sector.

The following themes emerged from the open-ended survey responses:

Some male students seem to have recognised and agreed to the reality of gender-based discriminatory attitudes within the industry suggesting that women needed to accept such attitudes and start acting like ‘one of the boys’ or ‘achieve a reputation’ by ‘showing their worth’:

Women need to be mentally tough as the construction industry is very much a male dominated industry and so women do get hassle (*Final year male student*)

The built environment is a male establishment, so for a woman to succeed they have to start off showing that they are as good (if not better) than their counter part. Before they can change things and for things to change a woman has to be at the top of the table (*Final year male student*)

I would agree that women need to follow male career patterns at present, although I do not believe that it should be so (*Final year male student*).

Two levels of acceptance can be identified in this context: active and passive. ‘Active acceptance’ implies that recognition and acceptance of gender-based inequality translate into day-to-day group or individual practice and behaviours. Such behaviours, in turn, cement or further perpetuate inequality. The impact of such practices on career intentions of female engineering graduates was investigated by Barbara Bagilhole in her 2006 research. Bagilhole concluded, ‘While most students felt they were treated fairly and justly, women did encounter sexist banter and often felt undermined by their male peers and staff’ (Bagilhole 2006, p. 20).

Within the context of ‘passive acceptance’ an individual may not agree or endorse gender-based inequality but, equally, may not resist or challenge it, therefore perpetuating inequality ‘passively’. One of the final year male students ‘delegated’ the responsibility of challenging the sexism and discrimination within the industry onto women themselves, commenting that ‘There needs to be a tranche of women who make a move into construction and really take it by the scruff of the neck - not suffragettes style, but certainly a concerted effort’ (Final year male student).

Echoing the findings and argument of Bagilhole (2006) mentioned above, our study found that in discussing a variety of difficulties, which female employees may encounter within the sector, female students tend to ‘idealise’ the power of qualification and personal determination. Gender-based inequality may be so embedded that there is an unwillingness to acknowledge that ‘change’

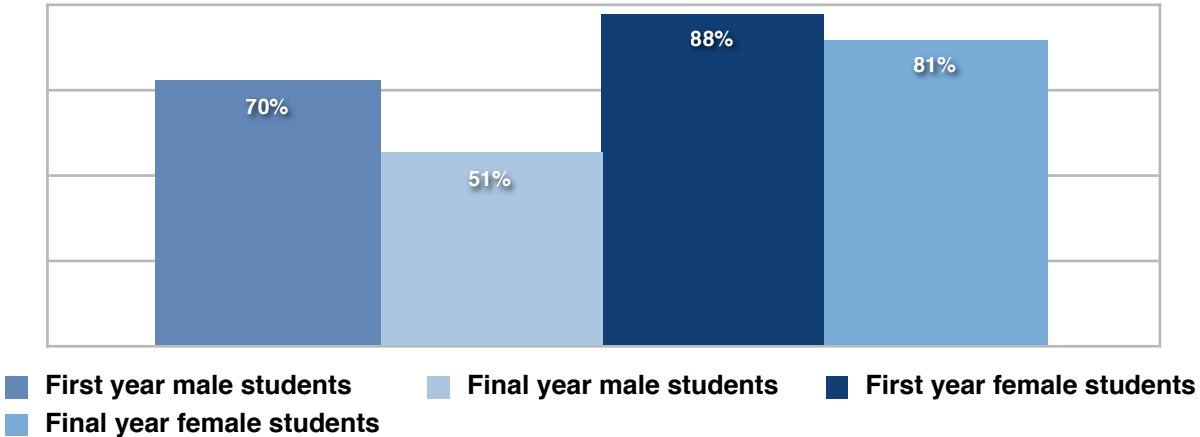
had not yet occurred and that the majority of female employees still face gender-based disadvantage. Rather than admitting this, other factors are identified such as a lack of role models and lack of career patterns. These factors are underpinned by gender-based inequality, however respondents tend to overlook this causality.

I would say women do need to follow male career patterns as there are very few females to follow and it is hard to establish your own distinctive career pattern. *(First year female student)*
 With regards to following a male career path at this stage this is required as there are more men working in the Built Environment. However this is slowly changing and becoming a more attractive career path to women *(First year female student)*

A number of respondents emphasised the irrelevance of gender to the construction workplace suggesting that opportunities are equal for men and women within the industry and that equal opportunities would necessarily lead to equal outcomes:

There is no difference between male and females in construction. No additional skills are required *(First year male student)*
 Gender is irrelevant *(First year male student)*
 Women and men are equal *(First year male student)*
 If you know what you are doing it doesn't matter if you are male or female *(First year male student)*
 Women can be just as equally successful as men in Built Environment careers *(First year male student)*
 Once they have the relevant qualifications then they should have the same opportunities as their male counterparts *(Final year male student)*
 In my experience women are as capable of doing the job as any of the men. They are free to express themselves and shouldn't have to conform to anybody else's methods *(Final year male student)*
 Women do not need to have anything extra to what a man brings to the job and they don't need to follow male career patterns *(Final year female student)*
 No-one should feel they have to follow the path of another to be successful *(Final year female student)*
 Women can follow their own paths, it may be that they want a position that a man holds but she does not necessarily need to get it a man's way *(First year female student)*

Chart 9: Do women provide a different perspective in built environment?



Most respondents agreed that women could provide a different perspective within the built environment sector. Final year male students were the least convinced. Among those who agreed, a number of respondents alluded to women's organisational and communicational capabilities and skills.

Women have different requirements and perspective on what is more important (*Final year male student*)

Women are more sensitive on smaller issues which men may have neglected most of the time (*Final year male student*)

I think that women sometimes have a different approach to problem solving especially in male dominated areas of the built environment, e.g. contracting, a stronger female influence may be refreshing and help solve issues that arise in a different way (*Final year female student*)

Women are generally better communicators than men. Most men I have worked with would agree (*Final year female student*)

They could be better at communicating, and in human resourcing aspects (*First year male student*)

They might think things out differently in a different perspective (*First year male student*)

Women tend to be more rational (*First year male student*)

Women look at things from a different perspective to men (*First year female student*)

More organisational skills (*First year female student*)

It is not possible to conclude which perspective underpins the diversity of responses: an essentialist perspective that women think and work differently from men and that these differences are biologically 'hard wired' and, therefore, are not changeable, or a social constructivism perspective which argues that choice, behaviour and skills occur and change within cultural and social contexts. A nuanced understanding of how students conceive of gender-based differences and gender-based inequality should inform diversity training initiatives, why they are needed and what the content should be. Diversity training has the potential to address entrenched gender stereotypes which often translate into gender-based discrimination in the workplace.

Some students emphasised the importance of different experiences in making women's perspectives unique and valuable:

They could - depending on the person - It's all about experiences (*Final year male student*)

They can be far more open to different options, from my experience. They can offer an alternative opinion, with a certain freshness as they are not aspiring to fit a certain male 'model' of behaviour (*Final year male student*)

Women have a different life experience than men therefore are always going to bring something different to whatever job they are in (*First year male student*)

Some students were convinced that there were no gender-based differences and that neither gender could offer more or less than the other:

I have not seen any evidence that a different perspective is required (either by men, women, or the industry as a whole), I don't know what this would look like, I don't know if women would, could or should provide this (*Final year male student*)

I do not believe that women in the built environment offer any more or any less than males (*Final year male student*)

There is no 'male' or 'female' in ideas in the built environment, design wise (*Final year female student*)

I think that the perspective is based on the construction materials used and not on gender (*Final year female student*)

Women do not provide any better perspective than men. We are equal (*First year male student*)

The thought and design process depends on an individual's brainpower, not their gender. As such, men and women should be treated as equals (*First year male student*)

What different perspective could they give? To have equal success and equal impact, you must follow the same path (*First year male student*)

Some respondents emphasised the uniqueness of each individual perspective, male or female, and the potential value of such individual contributions:

Construction team members should be inclusive based on talent and ability. Meeting gender targets applies false constraints on team dynamics. Different perceptions are based on experience, skill base, and perception. Which is neither gender specific or construction specific (*Final year male student*)

There is a perception at the moment that construction is macho and you need to be able to shout and argue to get things done. I disagree with this - I think in most cases, people (male or female) would be listened to more fully if they show themselves as calm and capable (*Final year female student*)

Each person looks at things differently therefore providing different opinions (*Final year female student*)

All individuals can provide new insight. Women are no different (*First year male student*)

Overall, one of the key findings of this research is that the majority of female and male respondents felt confident and capable of entering the sector and making a contribution towards creation of a 'better and functional' world. Respondents perceived gender merely as a factor which underpinned but did not restrict or limit the unique nature of such contributions. Neither male or female respondents perceived gender as a significant factor in determining individual career opportunities:

My gender is nothing to do with my career. I am capable and intelligent, if others are short-sighted, it is their problem entirely. If they need me to prove myself then I shall and it is no difficulty. There are plenty of companies out there which are blind to gender or race, the narrow-minded areas of the industry will be forced to change (*Final year female student*)

What difference does it make? (*Final year male student*)

It's 2008 (*First year male student*)

I am in touch with my feminine side and would not let social norms dissuade me from pursuing a career path (*First year male student*)

Perhaps yes [gender influences career choices], but I think careers are usually picked today based on their potential income (*First year male student*)

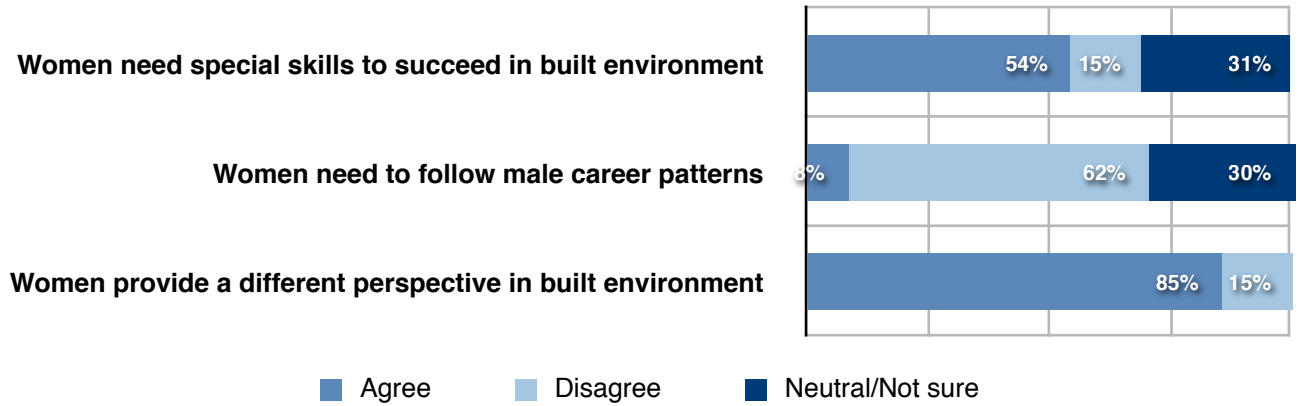
I don't think it should influence your career decisions I think you should go for a career you'd be good at and would enjoy (*First year female student*)

Kay (2001, p.25) in her analysis of women and men in the professions in Scotland notes that similar opinions were expressed by young women where '...every cohort of young women believes that the gender battles of previous generations are over and they are now able to make progress on their own merits'. By denouncing the role of gender in defining social, economic and cultural location of each individual in any society, some students seem to be overlooking the fact that the construction of individual identities involves a complex process of negotiation and re-negotiation of its various aspects, including gender. Aveling (2002, p. 277), for example, notes the role of gender along with other factors such as parental expectations, peers, schools, social class and even chance events in producing discursive fields within which individual subjectivities are constructed and reconstructed. The influence of the 'construction culture' which takes shape in day-to-day practices, behaviours and attitudes in various locations (universities, placements and employment) on the construction and re-negotiation of such subjectivities, is necessarily gendered. Ignoring the influence of gender is one of the dimensions of this process of 'gendering' which translates into different employment outcomes for men and women (see Appendix 1 for more statistical data on men's and women's location in the construction industry in Scotland).

Employers' perspective

Employers were asked a number of questions about their attitudes towards women working in the built environment. The questions were similar to those used in the students' survey to enable comparison in attitudes.

Chart 10. Employers: attitudes towards women working in the built environment



Employers' responses were similar to those of students' in this survey: only some employers (not an overwhelming majority or minority) believed that women needed special skills to succeed in construction; a minority believed that women needed to follow male career patterns, and a majority believed that women provided a different perspective in built environment.

I think they [skills that women need to succeed] are just exactly the same as the boys need because when we see boys, they range from sixteen to twenty-three and they all are naïve; they have all been mothered, they have all been 'out in the headlights'!

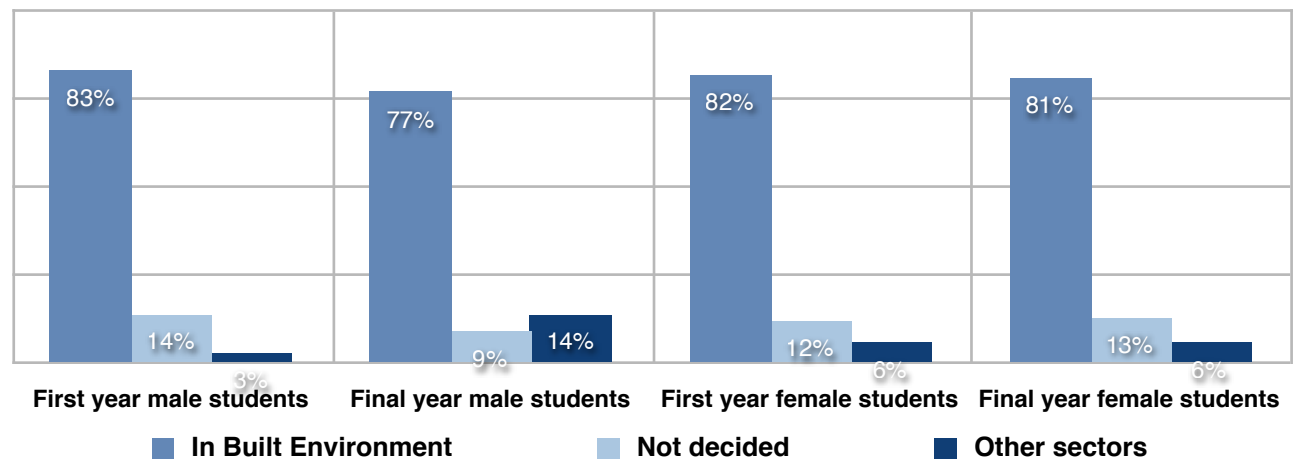
You need to be competent; if you're not, you don't get into the job. It is not down to gender - that is down to whether you know what you're doing or not.

I've not come across any examples of where a woman in our business has had to do more in comparison to the males. It may just be that they're better at their job.

7. Plans for future careers

The survey asked all respondents about their post-university career plans.

Chart 11: Where do you intend to work upon graduation⁸?



⁸ Other sectors include logistics, banking, investment banking, transport planning, music promotion, project management, energy, health.

Most respondents were either employed or intending to seek employment within professional sectors corresponding to their field of study. Some students, however, were either not sure about which sector they might be working in or had already formed preferences to work in sectors other than the built environment.

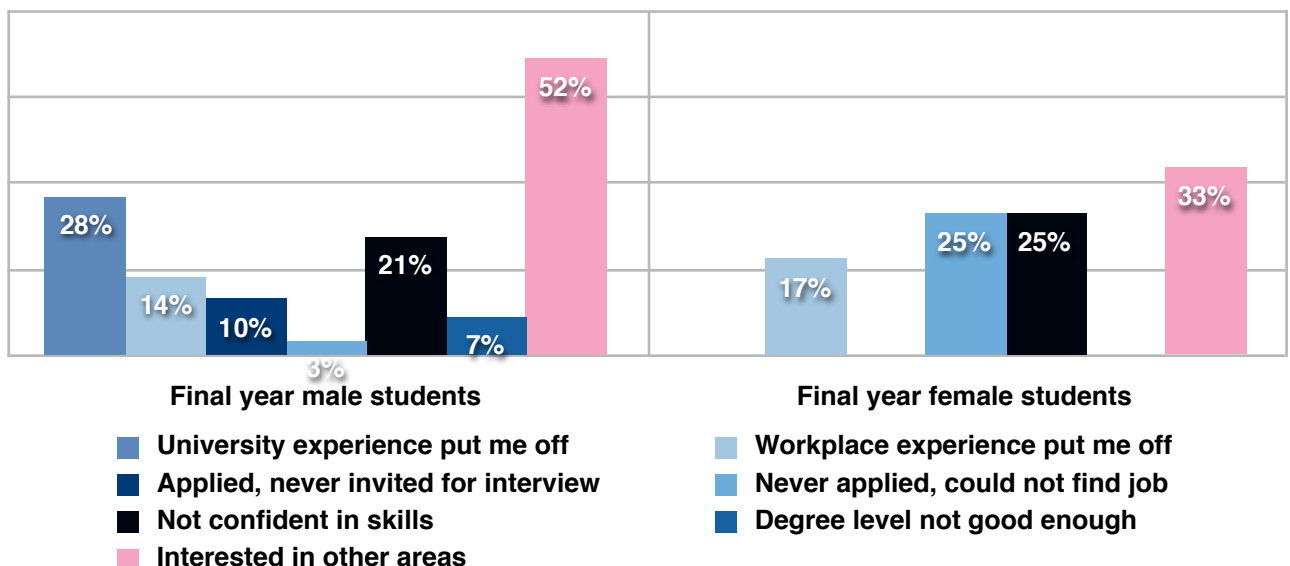
Overall, the majority of female and male students intended to stay within professional sectors corresponding to their field of study. 13% of final year female students and 9% of final year male students were yet to make a decision about their future career.

What might discourage students from continuing in the built environment?

Final year students, who decided to seek employment outside the built environment sector, were asked to identify which factors had influenced their decision. The survey also invited students intending to seek employment within their area of specialisation to identify factors which, in their view, could discourage other students from pursuing a career in construction.

No respondents said that they had chosen the wrong profession. Students in this survey identified 'developing an interest in other professional areas' as the main factor capable of drawing students away from the sector (52% and 33% of final year male and female students respectively).

Chart 12: What might discourage students from continuing in the built environment?



Students were asked why they thought graduates might decide not to go on to work in the built environment sector. 28% of male respondents considered university experience as having a negative influence on graduates' decision to stay within the sector, followed by the lack of confidence in skills and negative work placement experiences.

For female respondents, it was a perceived lack of jobs within the sector and lack of confidence in skills (25% for both) that were seen as the second and third most serious challenges to securing the first job within the sector.

Only 3% of male in comparison to 25% of female respondents agreed that the difficulty of finding a job within the sector was a detrimental factor in retention of qualified staff. Differences in the perception of employability by gender are discussed in section 'Perceptions of Employability after Graduation'.

The significance of 'developed an interest in other professional areas' factor echoes results reported by Graft-Johnson et al. (2003) in their analysis of disproportionate number of women leaving architectural practice. None of the respondents in their study who decided to leave architecture and seek employment elsewhere '...said that they hated the activity of architecture. Some said that the problem was with the profession' (ibid., p.25).

What happens to graduates?

Some information on the first jobs held by graduates is provided by the annual First Destination Study that 80% of students (on average) complete. The 2007 Study shows that the majority (84.1%) of 2004/05 graduates from architecture and building courses in the UK (who completed the 'First Destination' survey) entered the sector within 6 months upon graduation; the remaining 15.9% of graduates took employment in sectors not directly aligned with their degree specialisation (Prospects 2007). Among civil engineering graduates, 74.3% entered employment within the built environment sector (including 67.5% directly related to civil engineering), 15% were employed in associate professional and technical occupations (for example, school technicians) and the remaining 10.8% were employed in sectors not directly aligned with their degree specialisation (ibid.)

The available 'first destination' statistics, however, provides a picture of where some but not all graduates are. The results might also be skewed by the fact that some students might take any job available after graduation to pay off loans and debts. If this is the case, what remains unclear is why some (15 to 20%) graduates do not take up employment opportunities available within the 'graduate-hungry' built environment sector which, in most cases, compares favourably to other sectors in terms of pay and benefits.

In 2002, Angela Canny and Peter Elias at the Warwick Institute for Employment Research completed an analysis of the Labour Force Survey (Department of Trade and Industry 2002) which explored ways in which the UK could maximise the return on the investment made in training graduates in science, engineering and technology (SET)⁹ and address projected skills shortages. The study concluded that: (a) only a minority of SET graduates were employed in SET occupations (40% of men and 25% of women); (b) women with SET degrees were economically less active than their male counterparts or female non-SET graduates', (c) many who left SET retain negative images of the sector (ibid.)

The outcomes of Canny's and Elias's research cannot be extrapolated directly to the built environment sector in Scotland. At present there are no comprehensive data available in public domain on the number of built environment graduates by specialisation and gender in Scotland, where these graduates go and whether they 'stay on' in construction. However, these outcomes provide a starting point for discussion of factors influencing graduates' decision to stay or leave the sector. It can be suggested that the first significant 'leak' in a 'graduate leaky pipe' occurs immediately after graduation with about 20% of male and female students being either unsure about entering the sector or having decided to search for employment elsewhere. This raises aspects for which further research is needed: (a) why not all qualified graduates willing to work within the sector enter the industry upon graduation, and (b) why some of the graduates look for and find employment in sectors other than the built environment.

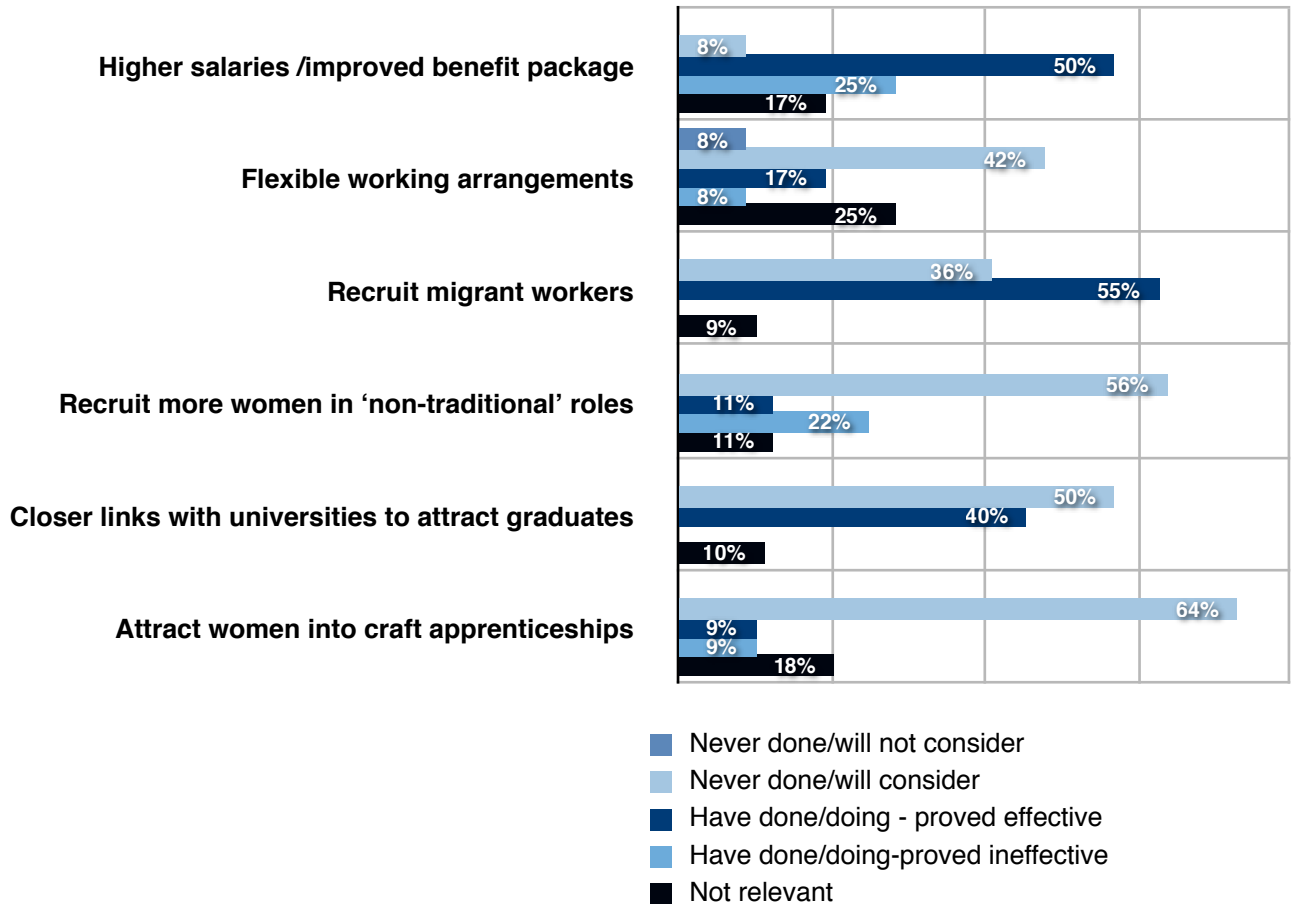
Responding to recruitment difficulties within the sector: employers' perspectives

The majority of employer respondents experienced problems in recruiting managerial personnel (82%), followed by professionals (73%) and crafts men/women (55%). About 70% of companies indicated that recruitment had become more difficult over the last five years. Companies were asked to indicate which measures they considered or were willing to consider to counter the impact of recruitment difficulties.

The majority of companies (77%) were willing to support positive action events (career fairs, awareness campaigns targeting women and girls) which may lead to the recruitment of more female graduates/qualified women. A quarter of companies indicated that they would welcome more qualified/ skilled women initiating contact with the company.

⁹ 'SET' graduates in this report included key and associate groups with the former incorporating engineers and the latter incorporating architects, town planners, and surveyors.

Chart 13: What did your company do or will be willing to do to address recruitment difficulties?



Recommendation 5. Setting out to recruit more women needs to go hand in hand with more support for the women who are studying and working, and a commitment from executive levels and management to challenge sexism and the industry’s culture which has traditionally been male-dominated. Family-friendly policies, now required by legislation, are needed to create the modern workforce.

Examples of good practice in family friendly policies in the sector need to be developed and shared. Equality and diversity training plays an important role in challenging attitudes and influencing culture.

Graduates leaving the sector: Choosing the job but not the culture?

I think the lack of women in the construction industry is mainly due to a cultural problem. There are no female role models (or few that one hears about) and most schools do not encourage potentially good female engineers to do maths, physics etc. The first step to change is to encourage women to take subjects which are more untraditional in schools. Once you're in university, you know what you're in for - that working will be a challenge due to your gender so you're more prepared to accept it. The Continent encourages women more than in the UK. We're doing something wrong (*Final year female student*)

In engineering, the prospects are low, pay is low and career progression only happens when someone leaves or dies. For women to fight stereotypes in such a setting would be more difficult than required. Why would they tackle a career that could easily go either way rather than choose a path that they are more stable and secure in? (*Final year male student*)

In their account of academic culture within the built environment discipline, Turrell and Wilkinson (2005) observe that organisational cultures underpin reasons why some occupations remain pre-

dominantly male or female. A number of studies explored the relationship between the predominant image of construction in the UK on the one hand, and gender-based disadvantages which affect employment and/or promotional opportunities for the majority of women and some men within the industry on the other. Gale, for example, notes that a good fit between a prevailing organisational culture and cultural preferences of an individual functioning within this culture leads to a satisfying social contract (1994, p.9). The complexity of achieving such a 'fit' results from an apparent cultural differentiation at national, industrial, organisational and individual levels (ibid, p. 10). In this respect Shanmugam et al. (2006) emphasise the complexity of exploring and theorising 'culture' in the construction sector characterised by a range of sector-based variations in cultures and values. Despite such differences, however, most of the organisational cultures within the sector are believed to '...actively work against women' (WEWIN 2006, p. 26).

Increasing the number of female employees in sectors where women are under-represented (or achieving 'gender parity' which implies at least 40% female representation) is suggested by some national and European policy-makers as a straightforward results-oriented solution capable of ending discriminatory practices and, ultimately, of eroding the entrenched gender-biased practices, beliefs and norms. However, achieving a 'critical mass' of women within such sectors and, therefore, securing their descriptive (as a minimum) representation does not, in itself, guarantee that institutional practices 'actively working against women' could be altered and disappear all together. Kay, for example, notes that the position of women in the professions will not change 'automatically [or] easily' as women enter professions in increasing numbers (Kay 2001, p. 4). Discussing the relevance of the 'critical mass' within the construction sector, Greed describes it as 'highly optimistic and over-simplistic', concluding that it cannot be used as a predictive social concept without the acknowledgement of the entrenched cultural and structural obstacles:

'...more women does not necessarily means better. Some women are more acceptable to the construction industry than others. Such are the powers of professional socialisation, social class position, and personal perspective that it should never be assumed that any woman professional is going to hold substantially different or more enlightened views from her male counterparts' (Greed 2000, p. 183).

Socialisation into workplace culture

Shanmugam et al. (2006) scrutinise the assumption that all women entering the construction sector are full of determination to resist and challenge the prevailing 'macho' culture. They conclude that pursuing a career in construction entails a consent (explicit or implicit) to agree to its culture and therefore '...have a stake in promoting and maintaining this culture'. Greed (2000, p. 183) observes that 'outsiders' seeking entry to the profession, appear to be either 'socialised' to conform or face marginalisation, exclusion and discouragement.

The increasing number of 'first-timers' have been entering the sector via the higher education route (see Statistical Overview, 'Labour turnover, 'inroads' into the sector')¹⁰ making higher education institutions a site where the initial processes of socialisation into the culture of the construction sector occur and the identities of future construction professionals are shaped. Previous research argues that the dominant culture within university construction departments can be more important to the promotion and maintenance of the image of the construction industry than the mode and content of a course (Gale 1994, p. 12). Graft-Johnson et al., analysing retention of women in architectural practice, conclude that certain elements of macho culture start at university (2003, p.15) despite seemingly gender-'neutral' provision of the built environment courses. Parallels can be drawn to Aveling's analysis of schooling (Aveling 2002, p. 269): the assumption of 'equal' access to what has been traditionally 'boy's subjects' is part of the discourse that university programmes and training are gender neutral and that for the girls who are 'really' interested- 'anything is possible'. Providing students with equal access to facilities, textbooks, curriculum and lecturers ('equality of opportunity') will not necessarily result in the 'equality of outcome' since such provision fails to account for gender-based inequalities in cultural and economic capital among students and graduates, and address discriminatory practices, attitudes and values. Gale notes in this respect:

'In all institutions students are socialized, educated about and initiated into the construction culture. The masculine culture is actively and passively promoted' (Gale 1994, p. 8)

¹⁰ See, for example, 'STEP into Construction' - a project by ConstructionSkills which supports employers in the recruitment of Black and Asian people and women who are 'job ready' for example, college leavers with a technical certificate or vocational training, or university graduates looking for a starter job. This can include employer support for a six week work trial on the basis that they guarantee an interview for the young person at the end. The employer recruits on merit alone. <http://www.cskills.org/aboutus/policies/equalopportunities/>

Graft-Johnson comments on the failure of universities to lead the way in changing attitudes and culture of the (architectural) profession:

'It is very worrying that reports from some schools of architecture indicate that the treatment of women does not bear close scrutiny. Universities should be leading the way in changing attitudes and culture of the profession to accommodate diversity, but this does not seem to be happening' (Graft-Johnson 2003, p. 27).

It can be assumed with a reasonable degree of confidence that having reached their final year, the majority of students become fully aware of the predominant culture of the construction industry which, according to Fielden (2000, p.118) manifests itself in various ways, including 'informal recruitment procedures, advertisements and brochures displaying images which reflect masculine values and interests, unstructured interviews, discriminatory selection criteria and sexist attitudes'. Such culture, as Shanmugam et al. (2006) argue, discourage the majority of women from enrolling on the built environment HE programmes. Many of the women who do enrol on these programmes, as Gale suggests, 'appear to seek the construction culture' and become 'socialised into the construction culture through the education system' (Gale 1994, p. 11). The impact of such socialisation is evident from a comparison of attitudes and opinions expressed by first and final year female students in this survey.

'Leaky pipeline': developing an interest in other professional areas

A number of final year female survey respondents expressed their preference not to enter the construction sector upon graduation having developed an interest in other professional areas not directly related to construction. However, none of these respondents agreed that they should have chosen a different course or profession in the first place. It appears, therefore, that these respondents choose a career but refuse to be 'socialised' into its specific culture which becomes a part of the post-university career choice. Female and some male graduates might lack strategies and skills to resist or cope with the culture where '...discrimination or bullying goes unrecognised, or is not taken seriously by management and even colleagues' (WEWIN 2006, p. 12). Consequently, leaving the sector all together becomes the easiest option.

Although this study did not specifically explore the issues facing ethnic minority students enrolled on university construction-orientated courses, a situation similar to that of final year female graduates in this study was reported by Briscoe (2005, p. 1003). Analysing regional distribution of women, ethnic minorities and disabled people in the construction industry workforce, Briscoe notes that the significant numbers of ethnic minority students either fail to complete the course or seek employment outside of the construction sector on completion (Briscoe 2005, p. 1003).

The complexity of the problem warrants a separate and comprehensive study to fully analyse the dynamics and influences in the process where the culture of the industry might be rejected by qualified young graduates and professionals. However, an explanation suggested by Gale seems to be highly relevant in encompassing the central argument that some graduates might 'voting with their feet': unable and unprepared to step out of their 'comfort zone' when faced with unpleasant industrial or professional cultures, school students and undergraduates '...will seek to avoid it...in the same way they avoid the academic careers associated with these professions or industries' (1999, p. 9).

Female students' 'rebellion' against the industry culture and values might also explain the initial 'leak' in the pipeline of future female construction managers and professionals where the number of women enrolled on higher education construction-orientated programmes does not translate into the number of women employed in managerial and/or professional positions within the industry. In their critical analysis of the 'pipeline' hypothesis Whitelegg et. al (2002, p.6) observe that quantitative approaches to gender equality '...ignore organised resistance to change and the persistence of barriers to entry and progression of women in science and engineering professions' - the 'pipeline', as a result, becomes a 'leaky' one.

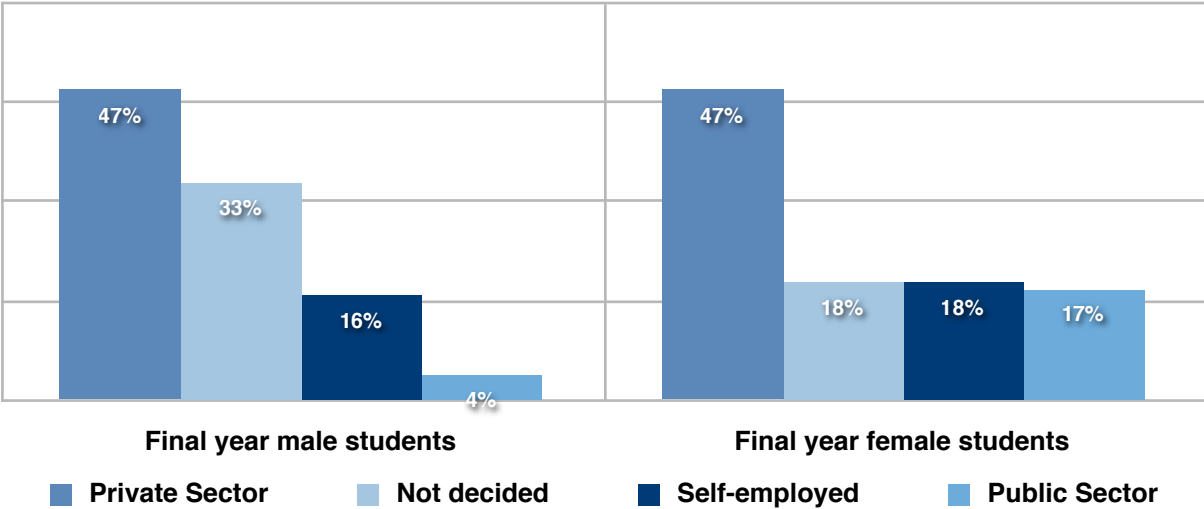
Qualitative Change in Culture

Within the context of this discussion, a shift is required from a 'quantitative' approach, with its focus on increasing the number of built environment graduates, to the 'qualitative' change in the industry's culture which seems to continue to discourage potential entrants and de-motivate graduates from entering the sector upon graduation. Such qualitative changes, however, are costly and difficult to implement, and require a fundamental re-ordering of the industry's values.

Jensen et. al (2005, p.6) commented that there had been a recent shift in research and policy-making towards understanding why increasing the number of female students on built environment programmes would not solve the problem of women’s under-representation within the sector. However, the quantitative ‘approach’ to addressing the problem of women’s under-representation within the sector continues to inform a number of initiatives. For example, the Skills Needs Analysis for the Construction Industry completed by ConstructionSkills in 2004, in a bid to reverse the decline in the number of construction HE graduates, recommends targeting sections of population - women and ethnic minorities - that would not consider the construction industry as a career option (ConstructionSkills 2004b, p.93). This approach may be adequate as a short-term measure to address immediate gaps in qualified professionals; however without challenging the male-dominated culture within the sector, disillusioned students are most likely to continue dropping out of university despite increasing amount of money spent to keep young people in higher education, while disillusioned and disappointed graduates are most likely to continue voting with their feet and seek employment outside of the construction sector.

Private and public sector employment: students’ preferences

Chart 14: Employment preferences: private or public sector?



Most final year students (male and female) would like to work for the private sector. Female students were more likely to consider working in the public sector than male students. Nearly a third of male students did not make a decision at the time of survey completion. Only 18% of female respondents considered self-employment as a career option. It might be that not all students were aware of opportunities and potential benefits of self-employment within the industry, which, according to the Equal Opportunities Commission’s research into sex segregation in training and work, enables individuals to combine domestic and caring responsibilities and paid work, with the highest levels of flexibility (Equal Opportunities Commission 2005, p. iii).

Concerns about working in the built environment

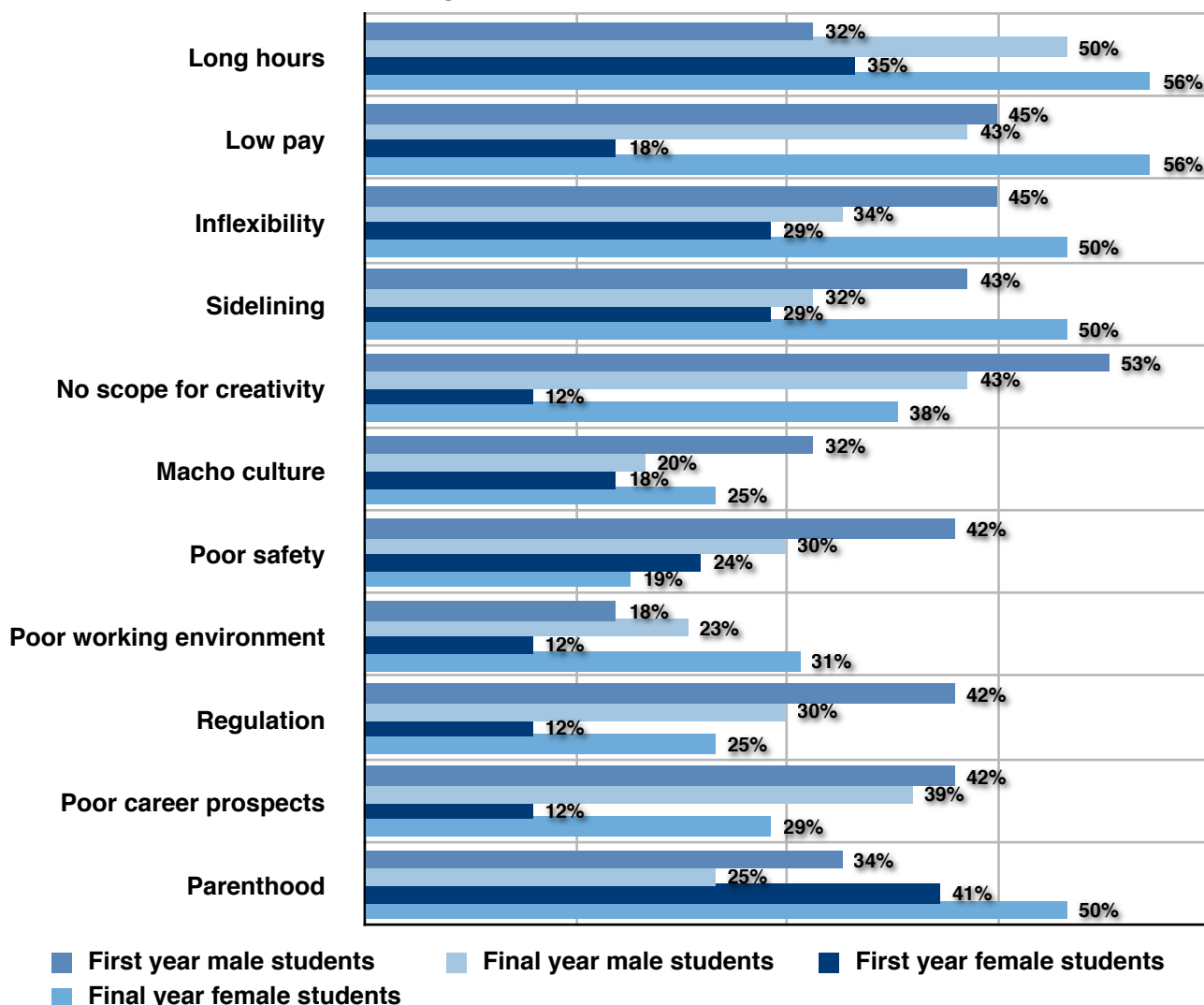
All students were asked to assess their concerns about working in the built environment using a scale from 1 (not concerned) to 5 (extremely concerned) to allow for comparison of attitudes between first and final year, and male and female students. The answers are summarised in Chart 15.

There is a noticeable difference in the perception of potential workplace/career-related difficulties by first and final year students. In addition, female and male students express diametrically opposed views and tendencies.

Final year female students were more concerned than their first year counterparts about all suggested negative aspects of working in construction. The only exception were concerns about poor safety - the least important area of concern for female students. The difference between first and final year female students’ level of concern was most notable for ‘low pay’ (38% difference between 56% of final year and 18% of first year female students) and ‘no scope for creativity’ (26% differ-

ence between 38% of final year and 12% of first year female students). Overall, final year female students were most concerned about long hours and low pay (both at 56%), followed by 'inflexibility', 'sidelining' and 'parenthood' - these concerned about half of all final year female students surveyed.

Chart 15: Concerns about working in the built environment



By contrast, final year male students were less concerned than their first year male counterparts about almost all categories apart from 'long hours' and 'poor working environment'. 'Macho culture' was the least concern for final year male students (20%), followed by poor working environment (23%) and parenthood (25%). Overall, final year male students were most concerned about 'long hours' (50%), followed by 'low pay' and 'no scope for creativity' (both at 43%).

It may be that first year students are less likely to admit having concerns than final year students. Responses demonstrate a marked divergence in perceptions by first and final, and male and female students. Factors behind such differences and the impact of changing perceptions on final year students' motivation to 'stay on' in construction may be an area to warrant further exploration.

Female students: concerns about parenthood and respondents' childcare responsibilities

Female students were more likely to be concerned about the impact of parenthood on their career progression than their male counterparts:

I imagine that taking an extended maternity leave period would be detrimental in the eyes of your employer, it might show a non-committed attitude to the job, might question how many hours you are willing to put in etc. (Final year female student)

Women taking career breaks for childcare are unlikely to return in the same or similar level of role. (Final year male student)

In modern Western societies women are still expected to get married, have children and provide care when needed (Aveling 2002). Equal in law, women are increasingly encouraged to 'have it all' by balancing career and family, and providing children 'with the best start in life' (Women and Equality Unit 2008). The ageing UK population (ESRC 2007) and insufficient public care provision for older people (Caring Choices 2008) increase the rate of dependency of the old and young on working-age population leading to the emergence of the so-called 'sandwich generation' - men and (mostly) women caring for parents and children. The data from 'The Cost of a Parent' report demonstrate that 'sandwich generation' women transfer a significant amount of money to their children and time to their parents (Womack 2008). It has been argued elsewhere (Aveling 2002, p. 270, Fielden et al. 2000) that unable to reconcile family, caring and work commitments, many women in full-time employment lose confidence and stay away from careers in management. Women who do follow a management career tend to adopt a male attitude towards career development and prioritise work responsibilities over domestic ones (ibid). The construction industry remains a male-dominated sector; as a result, flexible working arrangements taken by women working in construction are not regarded as normal whereas spouses and partners of male construction workforce may be taking advantage of flexible working in other sectors.

I would expect issues like raising a family to be accommodated in whatever career I choose, although I realise I may be naive! (Final year female student)

I will put my career first until I have a family then it will come second (Final year female student)

Most respondents indicated that they had no childcare responsibilities at the time of completing the survey; 6% of female and 8% of male first year respondents reported having childcare responsibilities. The share of final year students with childcare responsibilities increases to 13% for female students and 12% for male students.

The impact of childcare responsibilities on first and final year students

Two children and a wife who is supporting my funding and child care costs. Finding the time to study is challenging (Final year male student)

They undoubtedly impact. Having to balance life/ work/ uni - not always in that order, they do tend to suffer, however it is required to always remind my 'team' of the bigger picture and how it will be worth it when I graduate and beyond. I have, in earlier years, found it helpful to work towards deadlines as it allowed me more time with my family, however I am finding this difficult in my final year as the volume of work, combined with a baby is not a great combination. I will survive though, this is not a moan (Final year male student)

Had twins just prior to starting course, I just sleep less, and waste less time on trivial things. Its all about being focused (Final year male student)

My husband has to work from home on uni days and it is very difficult to organise as the timetable is only issued weeks in advance and the days I have to attend chop and change every semester, a total nightmare! (Final year female student)

Need a lot of support from family to cope (Final year female student)

Have to be home at certain times or up early to get son to school which can make me late (First year male student)

It does make it more difficult (First year male student)

Not at all, although if my children were sick I would want to be with them (First year female student)

Positive perceptions of working in the built environment

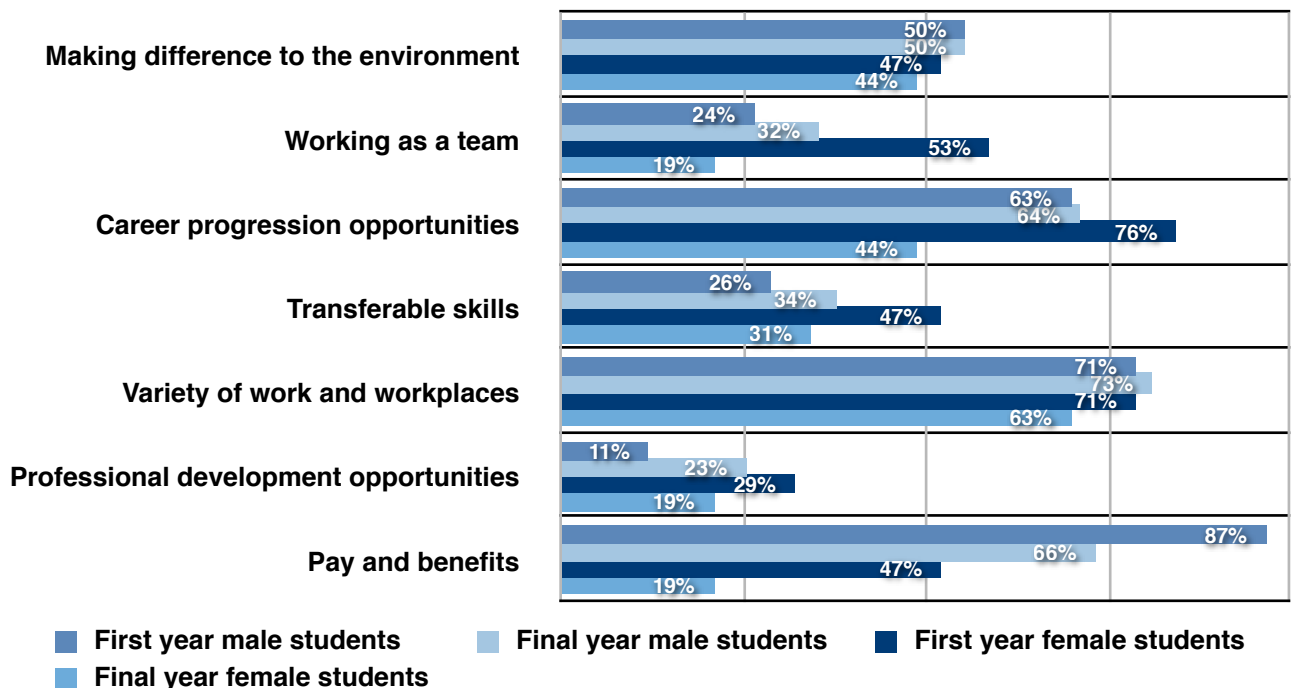
Students were asked what they saw as being the positive aspects of working in the built environment sector.

Final year male students are more likely to express positive attitudes than any other group and, notably, more than final year female students.

Some positive aspects of working within the sector identified by students included:

Working outdoors! Not being stuck in an office! (Final year male student)
Having a mix of office/site work (Final year male student)
Your work lasting longer than most other projects one might work on and the ability to improve/change the lives of thousands of people at a time as opposed to e.g. medicine, where you only help one life at a time (Final year female student)
Having a part in shaping the world that we live in (Final year female student)
To be able to build beautiful but practical buildings and structures (First year male student)
Do something monumental (First year female student)

Chart 16: Positive perceptions of working in the built environment



The chart demonstrates clear differences in the responses of first and final year female students. In all categories, first year students respond more positively than their final year counterparts. The difference is most noticeable in the following categories: 'working as a team' (34% difference between first and final year female students), 'career progression opportunities' (32% difference) and 'pay and benefits' (28% difference). These are all key dimensions of gender equality in the workplace. A clear difference in attitudes between male and female students, and between first and final year students within the same gender group (decreasing attractiveness of the sector to final year female students and increasing attractiveness to final year male students) may demonstrate the impact of the 4-year engagement with the construction culture which takes place within university departments and work placement environments.

Effectiveness of programme for employment purposes

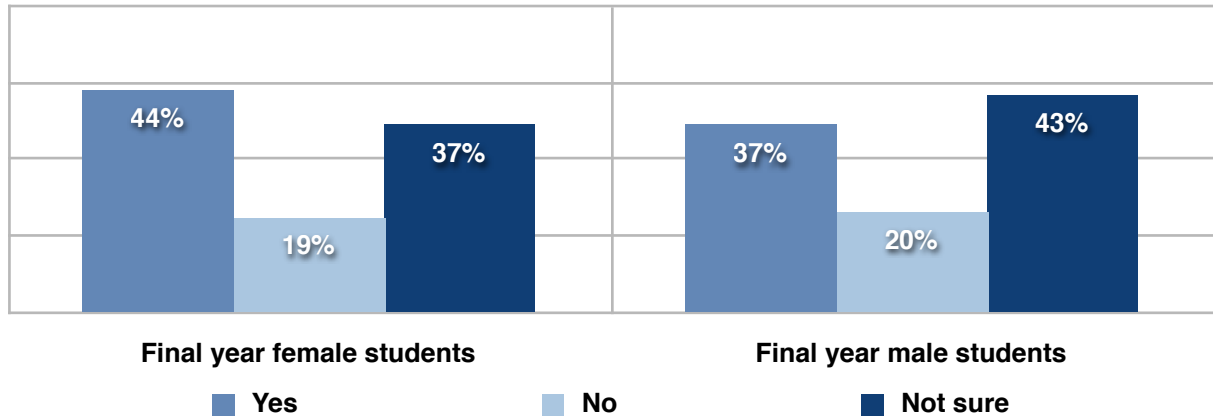
Final year respondents were asked whether their respective programmes had equipped them with a mix of skills required to gain employment within their area of specialisation¹¹.

¹¹ Responses were collected in February 2008.

Overall, less than half of respondents felt that their course had equipped them with required skills. A significant proportion of female (37%) and male (43%) respondents remained uncertain and about 20% felt that their course did not equip them with such skills.

The majority of employer respondents (77%) believed that not all university graduates came equipped with skills relevant to the current needs of the construction sector.

Chart 17: Do you think your course has equipped you with the skills you need to work in your area of specialisation?



Students' comments on the relevance of skills developed/university curriculum to the workplace:

I work and know that some things I learn in Uni have helped. Paired with my practical experience this will make me a pretty skilled graduate. (Final year male student)

The course content needs to be adapted to represent what actually happens in the workplace (Final year male student)

The quantity surveying course, has very little relevance to the work environment. The broad topics that are taught are of no real use, as they are only introductory, therefore if any of the information is required, further individual research must be undertaken. In addition, one of the main aspects of a surveyor, is taking of quantities, which is only a small section of the course, and it would be of benefit to carry out mock contract procedure, for a whole project. This is to allow the student full appreciation of the work involved in the workplace (Final year male student)

Course is very varied. It's hard to gain confidence in a single area (Final year male student)

Many activities carried out in university have no relation to work in the real world (Final year male student)

There are elements of maths and Auto CAD in lighting design but a lot of what I'd be doing in this career will have to be learnt on the job. About 80% of my degree will not be relevant (Final year female student)

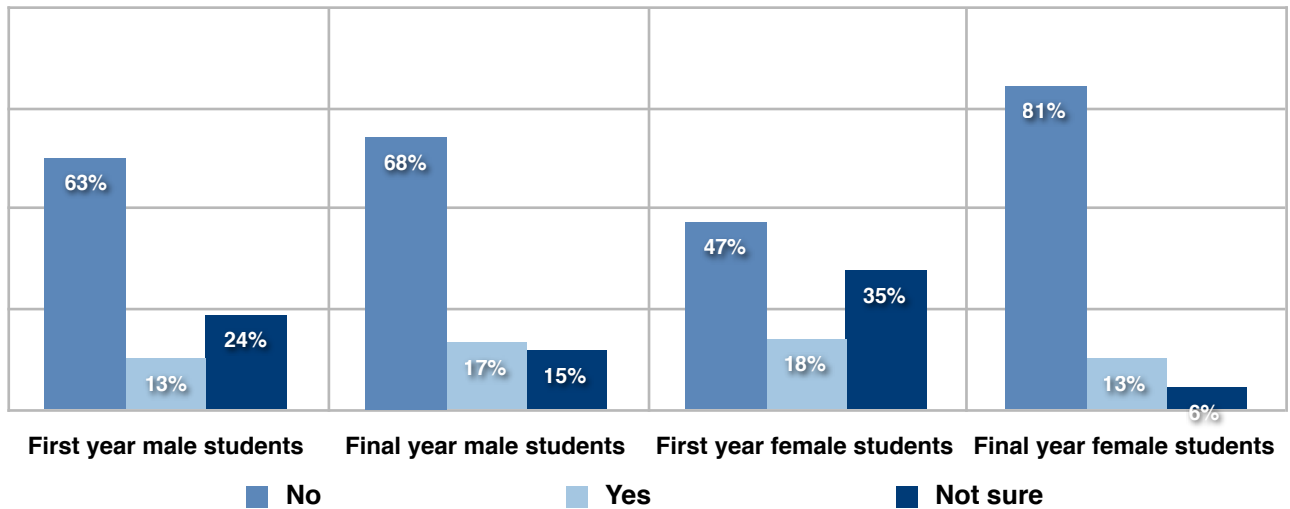
Because I work part time I found that my work experience had already equipped me with most of the info that I was being taught and that other course content had no relevance to my area of specialisation (Final year female student)

I believe that the course has given a general background to what I need to know, but has not been specific enough in certain key areas for me to be able to hit the ground running. I have achieved this by obtaining experience in the industry, which will undoubtedly offer me greater opportunities in the future than those who expect uni to give them everything they will need (Final year male student)

A large proportion of coursework set by the university is out dated and old fashioned and does not apply in a practical application in industry. This means that students leave university without the desired work skills to progress through a career in construction. Coursework needs to be built around the practices that are happening now in construction and not what was happening in the 70s or 80s (Final year male student)

Perceptions of employability after graduation

Chart 18: Do you think you might face difficulties in finding employment after you graduate from this course?



Final year female students were the most certain of their career prospects: 81% of respondents in this group were confident that they would not face difficulties in finding employment after graduation.

There is a clear difference in perceptions of employability between first and final year female students, with the former reporting higher level of uncertainty than any other group. Although about two-thirds of final year male students (68%) were confident about their employability prospects, 17% anticipated facing difficulties in finding employment upon graduation.

Considering the reported low levels of confidence in having the 'right' skill mix for the construction industry (see Chart 17), it might be suggested that higher levels of employability confidence are underpinned by students' awareness of skills shortages within the industry rather than by being aware of skill and qualification needs and requirements specific employers might have.

Students' views on the availability of employment opportunities within the industry

There are many opportunities not only in this country but all over the world (Final year male student)

I already have a job, and have been approached by another company on several occasions (Final year male student)

Excellent opportunities in civil engineering at the moment globally (Final year male student)

Managers are in high demand, I had a job for after my degree when I was in second year (Final year male student)

The market is currently booming so there is adequate opportunities elsewhere (Final year male student)

My experience plus the current shortage of skilled people within the Construction industry in general (Final year male student)

There is a shortage in lighting designers and few graduates are interested in this career (Final year female student)

Housing market is very buoyant at the moment and there are many long-term schemes in place across the UK that I am hopeful will provide a lot of work (Final year female student)

There seems to be an increase in demand for architects in the UK and there is always the option of working overseas (Final year female student)

I was told XXX University rarely doesn't find employment for students. Also I have already organised summer work in a surveyor's office and I could walk into a job (First year male student)

I have been sponsored by a company who seem interested in employing me after I graduate (First year male student)

There is a shortage of civil engineers and always jobs advertised (First year male student)

Recommendation 6. Students perceived the Built Environment curriculum as being not up-to-date with workplace practices. They felt that closer co-operation between Built Environment departments and companies would enrich programmes of study, as well as increase student employability.

8. What students think should be done

Students were asked for suggestions as to what could be done or improved by employers, universities and professional organisations to encourage students to 'get in, get on and stay on' within the built environment sector. These suggestions are presented below.

The overarching message is:

It is in the interest of employers, universities and professional organisations to try and get the best talent to work in their industry (Final year male student)

Students' suggestions for employers

Provide more placements

Providing work placements (Final year male student)

Individual employers should first of all provide training to the degree holders during their study time and if they think the individual is good for his industry he should provide him placement. In this way the employers can see individual's practical hands-on knowledge (Final year male student)

Provide work more BETTER paid work placements (Final year male student)

Provide relevant paid work experience (Final year female student)

Pay visits to universities

Visit students frequently (Final year male student)

Provide graduate training/mentoring schemes

Provide work with mentoring schemes (Final year male student)

Make more graduate places available (Final year male student)

They could set up graduate training programmes to ease graduates into employment and at the same time prepare them for their APC (Final year male student)

Work with school children/colleges students

Sponsorship from high school, e.g. school -> 1-2yrs work placement -> University -> Career (Final year male student)

I don't think that employers give school children enough information on their industry. I believe that employers should be going to schools and having lectures on their firms, what they do etc. As a result, many students end up going to university and doing any old degree(as I did)as they do not know what to do as a career (Final year male student)

Some companies could visit schools explaining what the career involves or take part in careers seminars (Final year female student)

Students' suggestions for universities

Help students with/organise work placements:

Work experience should be a greater requirement, either during term or during the holidays (Final year male student)

More help in finding placements (Final year male student)

There should be placements arranged by the university and industrial visits should be organised so that an individual can decide in which industry he would like to work and apply for the position (Final year male student)

Company visits, more placements if possible but for shorter periods of time, day release jobs. ie working on days off uni (Final year male student)

More help with finding first job, career advice (Final year female student)

Students' suggestions for universities (continued)

Provide more student support:

Enhance learning skills and make the students realise their efficiency in studies (Final year male student)

Work in partnership with industry/support students through partnership with employers:

Greater partnership and working links with companies, like placements as at these stages they can either nurture a person or give that person a better opportunity to look elsewhere (Final year male student)

More partnership with companies (Final year female student)

Work in partnership with schools and colleges:

Universities should be giving lectures to children in schools (Final year male student)

When I was at college, I was never made aware of the opportunities a career in the built environment could provide me. Because of this, I went and studied physics at University

Students' suggestions for professional organisations

More awareness campaigns:

Professional organisations such should run awareness campaigns and provide students with information about organisation and careers (Final year female student)

More student sponsorships and work placements:

Sponsoring (Final year male student)

Should provide work placements (Final year male student)

9. Further information on who the respondents were

Students: Universities represented

The highest number of responses received in all categories was from Napier University. These comprised 49% of responses from female students and 61% from male students. Napier University was followed by Glasgow Caledonian University which contributed 20% of male student and 18% of female student responses. Glasgow School of Art contributed the least (3%) and of these all were from final year female students.

The most represented groups in this survey were: final year male students – 44 responses (39%), first year male students – 37 responses (33%), first year female students – 17 responses (15%), and final year female students – 16 responses (14%).

Mode of attendance

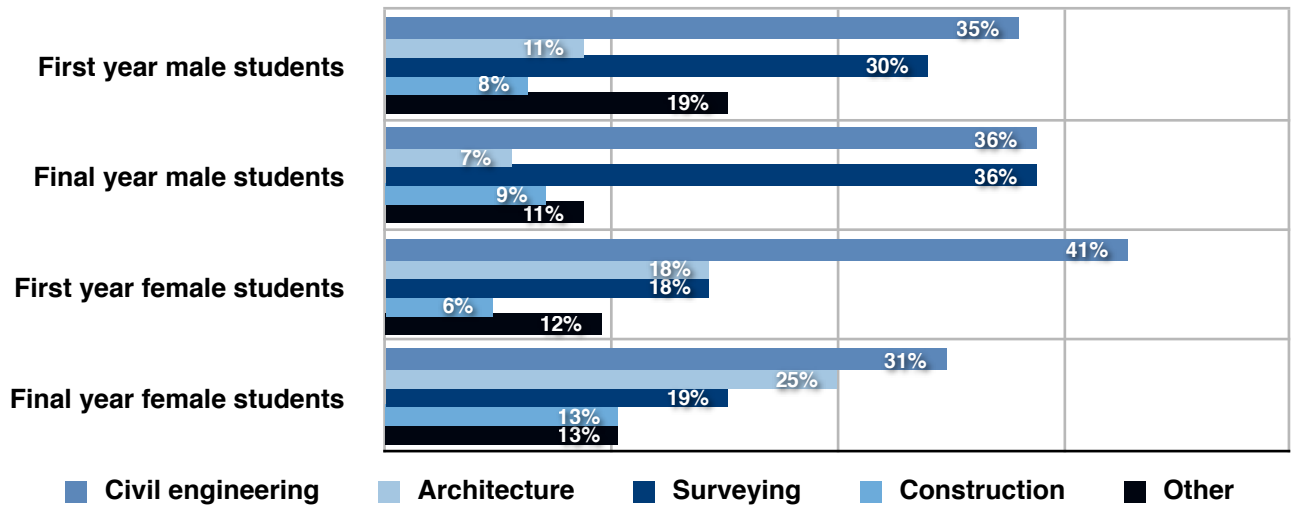
The majority of all responses from all four categories (about 80%) were from full time students.

Programme discipline

Overall, civil engineering accounts for nearly 34% of all responses received, followed by surveying (30%) and architecture (13%). Construction is the least represented group (7%) among survey respondents. The number of responses received by primary discipline can be illustrated as follows¹²:

¹² 'Other' includes various types of engineering not covered by 'Civil Engineering'.

Chart 19: Students by gender and programme discipline



Age and nationality

The majority of respondents from the four combined samples ranged in age from under-twenty to twenty-five. The majority of final year respondents were within the 20-25 age group (81% of females and 71% of males).

The majority of respondents were British (65% first-year and 81% final year female students, and 82% first-year and 59% final year male students). 34% of final year male respondents in this survey came from other European Union countries.

Employers

Number of employers who completed the survey: 13

Number of employers interviewed: 3

The majority of survey respondents employed from 50 to 249 employees (46%), followed by those employing over 250 people (39%) and small businesses with 10 to 49 employees (15%).

Respondents were asked to identify the percentage of women in their workforce. The estimates ranged from 5% to 16%. On average, women represented 9.8% of the workforce among the companies surveyed.

Respondents were also asked to estimate where within the organisational structure their female and male employees were. Most women were employed in administration/secretarial support (51%), followed by professional positions (22%) and management (21%). Less than 2% of women were employed at the crafts level compared to 58% of men; 18% of men were employed at the managerial level, followed by 10% employed in professional positions.

Appendix: Statistical overview

Construction sector in Scotland

Recession and construction sector update (provided by ConstructionSkills, August 2008)

The downturn in the housing market is likely to have a knock-on impact on sectors such as commercial and repair and maintenance (R&M). R&M is more labour intensive and therefore has a greater impact on the number of new entrants needed. Other sectors such as infrastructure are still showing very strong growth – however this sector is less labour intensive so requires less new entrants to meet demand from planned projects.

The construction industry is still expected to grow by 0.7% every year until 2013, which shows that the sector overall will remain relatively healthy despite the current economic climate.

Summary

- The construction industry in Scotland is expected to continue expanding for the time being.
- The challenge of attracting appropriately skilled and qualified employees has been affecting an increasing number of employers within the sector; skills deficit is one of the main anticipated challenges facing employers in the Scottish construction sector.
- Competition for qualified and skilled labour is expected to intensify among all sectors in Scotland, including the 'growth' stars of the Scottish economy - retail, distribution, health and social work.
- Most of the projected employment in the construction sector will be required to satisfy replacement rather than expansion demand for labour force, due to the ageing population in Scotland.
- The highest forecast increase in construction jobs will be in trades, however white-collar workers are also expected to be in significant demand.
- The construction sector in Scotland remains a white, male-dominated industry with less than 10% of female employees concentrated predominantly in administration.
- The demographic change of an ageing population means the potential pool of future employees will increasingly include older workers 'migrating' from other sectors potentially resulting in an increased competition for young graduates in a bid to reduce re-training and retention costs associated with the ageing workforce. However, it is likely that the pace of demographic change is slow enough to allow forward-looking employers within the sector to adjust their recruitment policies and practices.

Demographic trends in Scotland

Scotland's population of 5,117, 000 is expected to remain broadly stable for the next ten years, rising slightly to 5.13 million in 2017 (Futureskills Scotland 2007, p. 12).

People in Scotland are living longer. People over 65 accounted for 16% of the population in 2004. This is set to rise to 26% by 2031. The ageing of population in Scotland is likely to stimulate demand for additional housing within the context of decreasing UK-born working age population. Recent research by the ESRC and the Scottish Government's 'Scotland's Demography Research Programme' predicts a number of adverse macro-economic consequences linked to the ageing and declining population in Scotland¹³: 9% fall in employment, 8.2% drop in GDP, negative impact of rising real wages on competitiveness of Scottish exports (ESRC 2007, p.1).

Construction sector: Scotland

In 2007, the construction industry in Scotland was worth an estimated £7.3 bn, in 2000 prices, accounting for around 8% of the UK total construction output (ConstructionSkills 2008, p. 2). In

¹³ The Study concludes that in the absence of significant in-migration, Scotland's population is set to decline faster than any other EU country over the next 25 years (ESRC 2007, p. 1).

2006, the sector employed 212,400 people (ConstructionSkills 2008, p.1). It is a significant and growing contributor to the Scottish economy.

The sector is dominated by a significant number of small companies: 55% have fewer than 5 staff, and 79% employ 10 or fewer staff. Such small companies account for approximately a quarter of all employment. Companies with 50 or more staff represent only 4% of all establishments but they account for 42% of all employment (ConstructionSkills 2003, p. 4).

The average weekly full-time wage in Scottish construction sector was estimated at £443 (as of 2005), 13% higher than the Scottish average. Despite this substantial wage premium, the main anticipated challenge facing the sector was attracting appropriately skilled staff (Futureskills 2005, p. 4).

Future growth and demand for labour

The construction industry in Scotland has enjoyed a period of strong demand which has translated into sustained growth. The industry continues to expand faster than the national economy generally: over the year ending in June 2006, Scottish GDP grew by 2.2% against the previous year, while construction grew by 4.6%' (Scottish Executive, Scottish Economic Statistics 2006, p. 32). The 2004 ConstructionSkills report concludes: it is safe to assume that, providing it can source sufficient labour, the construction industry will enjoy the period of sustained growth (ConstructionSkills 2004b, p. 38).

Strong demand for the construction industry services is underpinned by Government aspirations for health, education, housing, transport and other infrastructure (ConstructionSkills 2004b, p. 3). The 2008 Labour Market Intelligence Report 2008-2012 developed by Construction Skills Network Scotland (2008b) anticipates that over the period of 2008-2012, total construction output will rise by an annual average rate of 1.2% (p. 8).

The 2007 Construction Skills Network Report envisages that the highest increase in construction jobs in the UK will be in trades, but white-collar workers are also expected to be in significant demand. Over 32% of the forecast increase is for professional roles, such as construction managers, architects and technical staff (ConstructionSkills 2007, p. 10). This requirement is likely to be met by graduates from higher education, including female graduates.

Competition among the growing industries for skilled labour is set to intensify. Three service industries - business services, retail and distribution, health and social work – are expected to account for just under half of all jobs in Scotland by 2017 dominating employment growth over the next decade (Futureskills Scotland 2007, p. 5).

It is expected that the task of building the London 2012 Olympics and the Crossrail project will have a negative impact on the availability of the construction workforce in Scotland. Approximately 33,500 Olympics-related construction jobs are expected to be created over the next seven years – based predominantly in the South-East of England, with civil engineering and a range of specialist skills in particular high demand. This is in addition to the overall projection of 88,000 new recruits per year required in England to deliver on the increasing demand the industry faces (HECSU 2007, p. 24).

Recruitment

On average, employers in the construction sector experience a change of staff equivalent to around a fifth of their workforces on an annual basis. In 2005, the labour turnover in the Scottish construction sector stood at 21% (slightly lower than 23% in other sectors) (Futureskills 2005, p. 6). Larger companies are more likely to recruit staff. In 2003, 6% anticipated a significant increase in their workforce; most of these companies were larger employers operating in site preparation or groundwork (ConstructionSkills 2003, p. 4).

Construction work is almost entirely done on a project-by-project basis. Contractors draw together teams of people who often work for a short period of time moving on to another location or dispersing once the project is completed (ConstructionSkills 2004b, p. 2). The fragmented, short-term project-based structure of the sector means that the majority of site workers enter the industry through informal routes and temporary work opportunities. Informal entry routes rely primarily on learning on the job and usually generate no formal qualifications. As a result, a low proportion of the industry workforce has formal qualifications (ConstructionSkills 2004b, p. 3). The

construction industry workforce in Scotland is generally more qualified than the industry's workforce in the UK overall (see Table 1 below).

Table 1: Construction industry workforce qualifications UK and Scotland: 2003

	Scotland	UK (including Scotland)
S/NVQ level 4 & above	14%	13%
S/NVQ level 3	27%	21%
S/NVQ level 2	7%	11%
Trade Apprenticeships	31%	21%
Below S/NVQ level 2	7%	13%
Other qualifications	5%	8%
No qualifications	8%	12%

Source: office for National Statistics - Labour Force Survey

Skills shortages

The construction industry in Scotland has a specific job pattern different from the rest of the economy. It is characterised by a higher proportion of skilled tradespeople – one in four of all construction sector employees' (Futureskills 2005, p. 4). In addition, it has a higher proportion of professionals (21% of employees in construction in comparison to 15% in other sectors) and of managers and senior officials (13% in the construction and 11% in other sectors) (ConstructionSkills 2003, p. 17).

This pattern shapes the profile of current skill shortages and, also, underpins the demand for skills and qualifications within the sector. Overall, in Scotland, it is anticipated that the increasing number of labour force will hold further and higher education level qualifications (Futureskills 2007, p.5) in response to the increasing demand for highly qualified workers and decreasing demand for unskilled workers.

Table 2: Comparison of future employment needs in construction and engineering

Sector	Projected employment			Demand		Job openings by 2017 (F + E)
	2007	2017	Change (C-B)	Expansion demand	Replacement demand	
A	B	C	D	E	F	G
Engineering	52000	36000	-15,000 (29%)	-15000	16000	1000
Construction	167000	163000	-4,000 (3%)	-4000	51000	46000

Based on: Futureskills Scotland 2007, p. 22, p. 25

Overall in the Scottish economy skill shortages remain uncommon; they affect less than one in 20 Scottish workplaces. However, compared to the rest of the economy, the construction sector in Scotland is '...characterised by a larger proportion of vacancies that are hard-to-fill; and more hard-to-fill vacancies that are the result of skill shortages' (Futureskills 2005, p. 6).

The majority of employers in the construction sector in Scotland are satisfied with how their existing employees cope with current requirements, including new technology, new construction methods and new materials. However, approximately 50% of employers surveyed by ConstructionSkills in 2004 reported problems with new employees who, although trained and

qualified for certain occupations, still lacked a variety of skills required (ConstructionSkills 2004a, p. 15).

Attracting appropriately skilled staff remains the main anticipated challenge facing construction sector employers – cited by 13% of construction sector employers in comparison to 8% in other sectors. Where skill gaps occur, employers in the construction sector are most concerned with weaknesses in technical and practical skills (Futureskills 2005, p. 3, 5).

Table 3 below provides a summary of the annual recruitment requirement for principal occupations within Scotland's construction industry between 2008 and 2012 (ConstructionSkills 2008, p.11). It shows that 25% of recruitment requirements are for professional and office based staff.

Table 3: Annual recruitment requirement by occupation – Scotland

Occupations	Annual recruitment requirement 2008-2012 (employees)	%
Senior and executive managers	<50	< 1%
Business process managers	150	2.3%
Construction managers	330	5.1%
Office-based staff (excl managers)	300	4.7%
Other professionals/technical staff and IT	<50	< 1%
Construction professionals and technical staff	750	11.6%
Trades and skilled operatives	4820	75%
Total	6450	100%

Based on: ConstructionSkills 2008, p. 11.

Women's employment in the construction industry

Women are playing an increasingly important role in the UK labour market. Over recent decades, the proportion of economically active men has fallen from 89% in 1984 to 84% in 2003, and the proportion of economically active women has increased from 67% in 1984 to 73% in 2003 (Office for National Statistics 2005). The majority of women, however, continue to face disadvantages in employment, including gender-based pay gap and occupational segregation which persists on both horizontal (men and women doing different kinds of jobs) and vertical levels (status distinctions between men and women doing the same job).

The overall gender balance in the labour force in Scotland is around 50% women and 50% men, and has been so for some time (Breitenbach and Wasoff, 2007, p. 102-103). However, women and men are distributed differently across and within industrial sectors. The majority of working women in Scotland are still found in just 5 occupational groups - the five 'C's – cleaning, catering, caring, cashiering and clerical (Equal Opportunities Commission 2007d). In 2004, women in Scotland performed most of the administrative and secretarial jobs (81%) and personal service jobs (83%); men hold most skilled trades (90%) and process, plant and machine operative jobs (86%) (EOCS 2005g, p. 7). Among managers and senior officials 38% were women, 62% were men.

Despite increasing numbers of women entering the workforce throughout the UK, the construction industry remains a white, male-dominated industry (Fielden 2000, Shanmugam, M. et al. 2006). The picture for Scotland is very similar to that of the rest of the UK with women making up just over 10% of total employment, a little under 2% of manual employment and 32% of non-manual employment (ConstructionSkills 2005, p.9). This makes the manual 'part' of the sector one of the most gender imbalanced in the UK economy (ConstructionSkills 2004b, p. 3).

Table 4: Participation of women in different roles in construction in Scotland

Categories	Women participation (%), Scotland
Population	52%
Economically active	47%
Construction workforce	10%
Craft and trade occupations	Less than 1%
Construction design and management	10%
All other occupations in construction	27%
Construction sole traders	0%

Source: CITB-ConstructionSkills Diversity in Construction 2004. Compiled using the Spring 2004 Labour Force Survey.

Construction and higher education in Scotland

Summary

- UK higher education institutions provide a variety of course and study options in the area of built environment.
- Over the last decade universities in Scotland have seen the number of students enrolling increase. In 2006, female students represented 56% of the student population in Scotland.
- Women are under-represented on built environment HE programmes. This under-representation is linked to subject choices made by girls and boys at school.
- In 2006-07 there were 2,005 first-degree students (including 67% of female and 33% of male) enrolled on architecture, building and planning programmes, and 3550 first-degree students (including 88% male and 12% female) enrolled on engineering and technology programmes at Scottish universities. The proportion of female students enrolled on built environment courses remained stable over the last three years with a tendency to decrease.
- According to the UK-wide Destination of Leavers from Higher Education Survey, about 80% of first degree graduates from built environment programmes in the UK were employed within the built environment sector 6 months after graduation.
- In Scotland, the proportion of graduates from architecture, engineering and technology programmes who gain their first employment in Scotland (72%) is less than the average for all students (80%).

Recent technological advances and introduction of modern technologies into all stages of the construction process will continue to underpin the demand for highly qualified labour force within the sector. The 2004 report by ConstructionSkills (2004b) suggested that one of the long-term priorities for the industry should be a stabilisation and reduction in the size of its current workforce based on a corresponding rise in the skills levels of those working in the industry (ConstructionSkills 2004b, p. 42). Within this context, the role of Scottish Higher Education institutions in satisfying the increasing demand for highly skilled construction sector employees is significant.

Men and women in higher education in Scotland

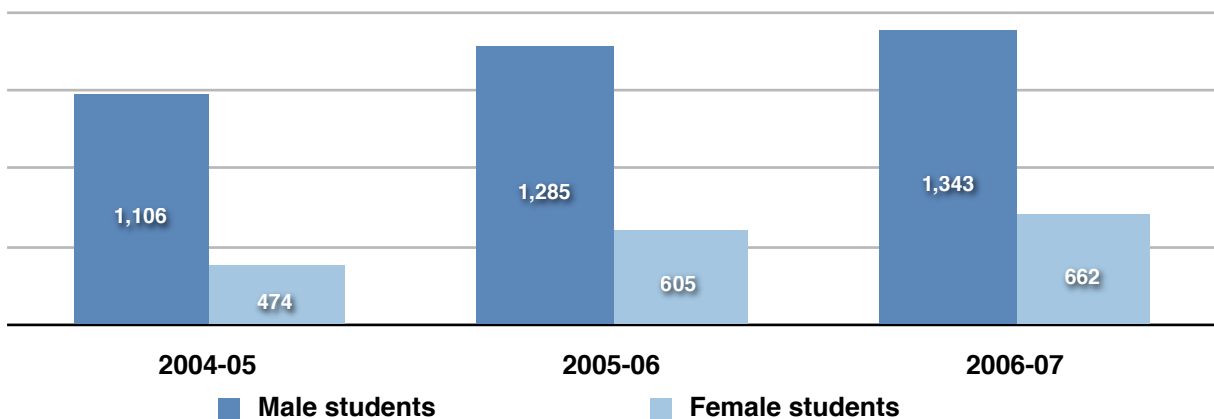
In 2006/07, 30% of school leavers from publicly funded secondary schools in Scotland went into higher education (25.9% of male and 33.6% of female school leavers); this compares to 79% of school leavers from independent secondary school (78% of male and 81% of female school leavers) (Scottish Government 2007, p.11-12). Overall, girls are more likely to go on to Further or Higher Education on leaving school, while boys are more likely to enter employment (Breitenbach and Wasoff 2007, p. 58). In 1996-97, 53% of higher education students in HEIs were female (Scottish Executive 2003). By 2005-06 this figure had risen to 56%.

Charts 20 and 21 demonstrate the number of first-degree students enrolled on built environment and engineering courses in 2004 – 2007 in Scotland.

The overall number of first-degree students enrolled on architecture, building and planning courses at Scottish universities increased from 1,580 in 2004-05 to 2,005 in 2006-07 (an increase of 27%). During this period the proportion of female students increased slightly from 30% in 2004-05 to 33% in 2006-07.

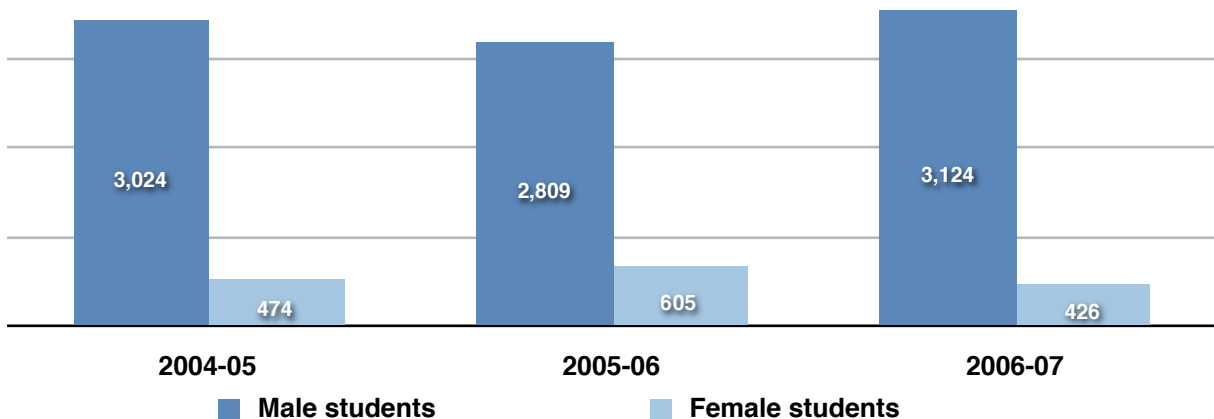
The overall number of engineering and technology first-degree students remained fairly steady over the 3-year period. The gender balance, however, has not improved: in 2004-05 there were 14% of female students, increasing to 18% in 2005-06 and decreasing to 12% in 2006-07.

Chart 20: Architecture, building and planning: first degree students in Scotl



Based on Scottish Executive (2007, p. 9) and Scottish Government (2008, p. 10).

Chart 21: Engineering & technology: first degree students in Scotland



Based on Scottish Executive (2007, p. 9) and Scottish Government (2008, p. 10).

Subject choices of female and male students in Scottish higher education

The majority of Scottish students enter higher education directly from, or soon after leaving, school. Girls now outperform boys at all levels of attainment in public and private schools in Scotland (SFC 2006, p. 6). The subjects which male and female students choose to study at higher education level generally reflect their previous subject choices made at secondary school level (Breitenbach and Wasoff, 2007, p.75). Schooling is recognised as an important site for re-production and re-negotiation of gender relations where sex-stereotyped subject choices are made. Such choices are believed to continue into further and higher education, with students often following patterns of ‘traditional’ male and female career choices (Breitenbach and Wasoff 2007, p.94). It is recognised that educational segregation based on subject choices leads to occupational segregation, which, in turn, contributes towards gender differentials in pay.

Gender preferences for HE courses remained stable over the last five years with courses allied to medicine attracting the greatest proportion of female entrants (85%) and engineering and technology courses attracting the greatest proportion of male entrants (87%) (Scottish Executive 2007). However, shifts in gender balance of students are notable in some subject areas. For example, women made up 62% of students of Medicine and Dentistry in 2004/05 compared to 55% in 1995/96, and 75% of students of Veterinary Science in 2004/05 compared to 52% in 1995/96' (Breitenbach and Wasoff, 2007, p.76). Over the same period, the proportion of female students in Engineering and Technology has decreased from 12% to 10%.

The destination of leavers from higher education: UK

The Destination of Leavers from Higher Education Survey (DLHE) is a national survey carried out six months after graduation, which achieves an average 80% response rate. It provides a snapshot of what graduates do after graduation.

Table 5: First destination: first degree graduates, full-time architecture, UK

Industry	Men		Women	
	2002/03	2003/04	2002/03	2003/04
Property development and construction	575 (86%)	620 (88%)	260 (79%)	235 (85%)
Other industries	90 (14%)	85 (12%)	70 (21%)	40 (15%)

Based on: Prospects 2007

Table 6: First destination: first degree graduates, full-time building, UK

Industry	Men		Women	
	2002/03	2003/04	2002/03	2003/04
Property development and construction	1120 (79%)	1085 (80%)	120 (71%)	150 (81%)
Other industries	295 (21%)	275 (20%)	50 (29%)	35 (19%)

Based on: Prospects 2007

Table 7: First destination: first degree graduates, full-time civil engineering, UK

Industry	Men		Women	
	2002/03	2003/04	2002/03	2003/04
Property development and construction	650 (77%)	705 (78%)	105 (70%)	135 (77%)
Other industries	190 (23%)	200 (22%)	45 (30%)	40 (23%)

Based on: Prospects 2007

According to the 2003/04 first destination survey, 88% of male and 85% of female first-degree graduates from the UK architecture courses were working in property development and construction, with the remaining 12% and 15% respectively choosing their first job in other industries such as hotels and restaurants, retail trade, financial activities.

In comparison to architecture, less first-degree graduates from full-time courses in building and civil engineering secure their first jobs in property development and construction: 80% of male and 81% of female building graduates, and 78% of male and 77% of female civil engineering graduates.

However, the survey results cannot be treated as fully representative of what graduates do in the longer term: the data provides only a snapshot survey of graduates shortly after graduation; it does not ask graduates about their future career plans, therefore, it '...cannot be used to answer questions about the intents of new graduates, nor of their reasons for choosing some of the career options' (HECSU 2007, p. 1).

Other research demonstrates that there is further leakage of graduates from science, engineering and technology professions when qualified employees, who enter the sector after graduation,

leave it later in their career. Estimating the number of built environment graduates employed within the sector represents a methodological challenge. As a result, only a few such studies have been undertaken so far, including the 2002 'Maximising Returns to Science, Engineering and Technology' report published by the UK Department of Trade and Industry which concluded that only 40% of male and 25% of female SET graduates are employed in SET occupations. The study by Graft-Johnson (2003) estimates that the proportion of female students of architecture falls from being around 38% of the student population to only 13% of the architectural profession (Graft-Johnson 2003, p. 1). The review of the existing literature identifies a need for an up-to-date in-depth quantitative assessment of long-term recruitment patterns of built environment graduates in both Scotland and the UK.

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