Construction Industry Advisory Committee (CONIAC)

Keeping Pace with Change Working Group

Anticipating and tackling new health and safety challenges

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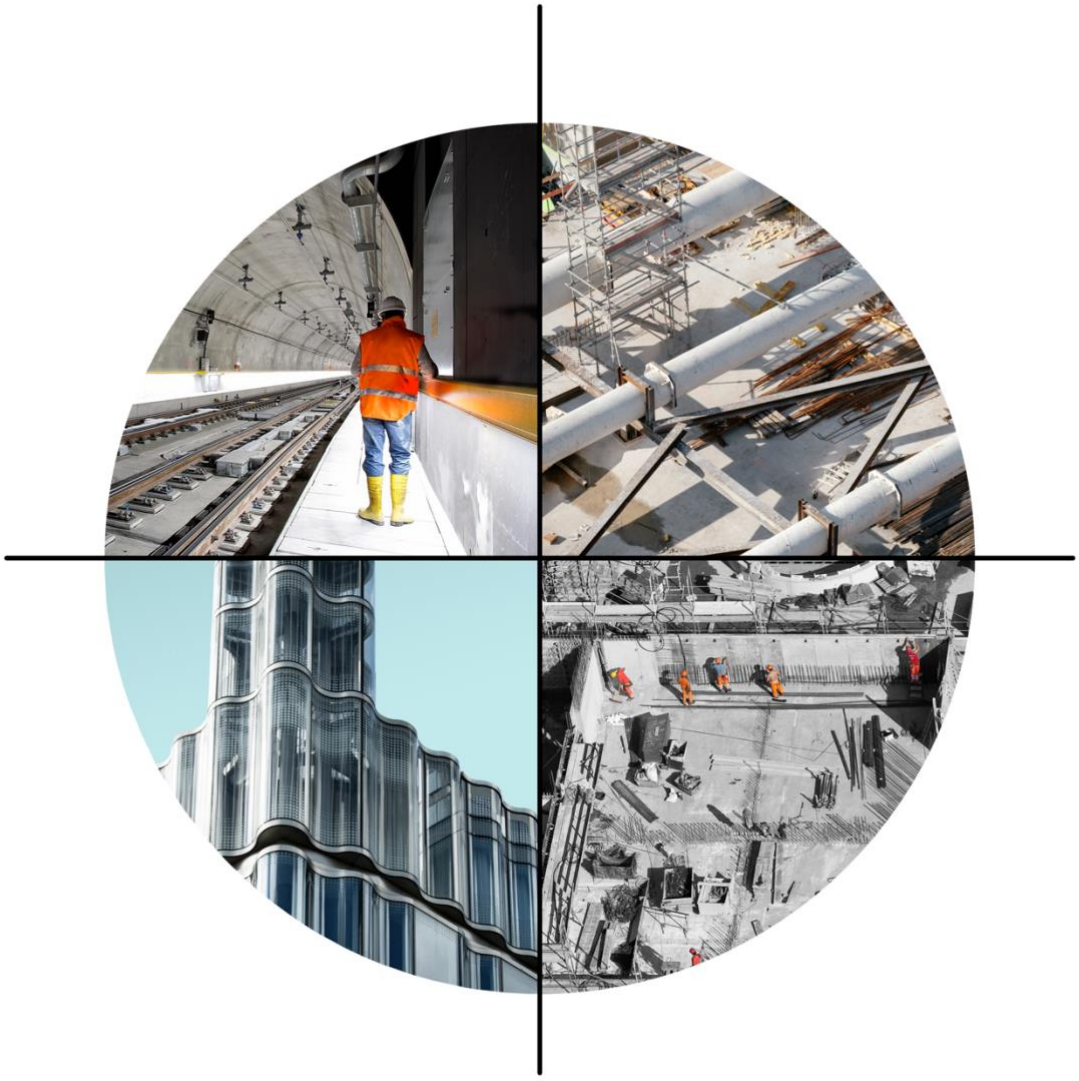
CONIAC – KPWC WG - DESIGNER RISK EDUCATION PROJECT

a review of data gathered from the student health and safety questionnaires



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Executive Summary

In the construction industry, designers and other professionals play a key part in the identification of hazard and the management of risk. All professionals require adequate knowledge and understanding of occupational health and safety (OHS) to enable them to perform their roles effectively and discharge their duties under CDM 2015 and other relevant legislation.

This report highlights potential areas of concern identified from a review of survey data gathered from recent construction graduates and construction industry employers.

The survey asked respondents to reflect on the OHS components of their degree courses across four categories: key legislation, key concepts (harm, hazard and risks), confidence (eliminating and prioritising risk) and practical skills (ability in applying knowledge at site level). They were also asked to assess their overall preparedness for employment.

Key findings

This report accepts that there were limitations to the research, but nonetheless the findings give cause for concern.

From the graduates completing construction-related degree courses, just over half (52%) agreed that university suitably prepared them for work in the industry, but 48% did not agree.

Construction graduates entering the world of work felt they were unprepared for understanding, assessing or controlling hazards and risks. The survey revealed significant shortcomings in graduates' knowledge and ability on key aspects of OHS management.

The importance of OHS attached to learning at university varied markedly across the disciplines examined and there was lack of agreement from graduates on the best methods of teaching.

Graduates' rated their own ability significantly higher than industry employers with employers generally of the opinion that graduates were not as knowledgeable or confident as they believed. This suggests the quality and content of OHS components of construction-related degree courses has been inconsistent and insufficient for providing graduates with the knowledge and skills needed in the workplace.

Where OHS is included, the results suggest it may be outdated and unrepresentative of the modern world of construction. Overall, these findings do not reflect well on graduates' recent experience of tertiary education providers.

Conclusions and recommendations

It is accepted that the purpose of undergraduate degrees is to provide a broad base of underpinning knowledge and that the role of educational establishments is to deliver this and equip graduates with the theoretical understanding and analytical skills required to embark upon a career in their given profession.

This report has identified potential weaknesses that need to be addressed and recommends collaboration between relevant stakeholders to facilitate improvements to the teaching of OHS at undergraduate level. Whilst different disciplines and universities will adopt different approaches to the subject, depending on the nature of the degree course, there should be a common core of knowledge and skills which all construction graduates should be expected to acquire.

Education providers need to ensure that adequate and suitable health and safety content is fully integrated into the syllabus, to ensure graduates entering professional roles within the construction industry have the up to date skills and knowledge they need for effective performance.

A coordinated and aligned approach by industry, the institutions and education-providers, to address the variability and inconsistency in undergraduate OHS, should help ensure that employers expectations are understood and met. This should initially assist employers as the graduates make the transition to the workplace however employers, obviously need to ensure all staff are provided with further training as necessary.

Effecting positive change will require a coordinated response - the Construction Leadership Council (CLC), supported by CONIAC and its Keeping Pace with Change working group (KPWC-WG) are best placed to lead this important work.

Background

For some years CONIAC and the Construction Industry Council Health and Safety Group have been concerned about how well architectural and civil engineering graduates were being prepared for employment, specifically how well-equipped graduates are in understanding OHS risk and their responsibilities as designers under the CDM Regulations.

Under the governance of the CONIAC KPWC-WG, a project to consider and assess the effectiveness of OHS components of construction design education was devised and published in the KPWC 2017-2020 workplan. This report is an output from the project.

Recognising the need to move from anecdote to harder evidence, the project team analysed responses to health and safety questionnaires completed by members of staff employed by leading UK consultancy firms operating in the UK construction industry.

This report highlights potential areas of concern identified from an analysis of the survey data (initially gathered by the University College London) and a further follow up survey of construction industry employers.

The questionnaires were directed at two specific groups of respondents, namely:

- university students who had completed undergraduate courses (between 2010 – 2016) and entered the construction industry; and
- construction industry employers who were employing graduates.

The surveys asked respondents to reflect on certain aspects of health and safety covered on degree courses at university, to assess the extent to which graduates were prepared for work in the industry, their knowledge of relevant topics, and the importance attached to health and safety during their studies. Students had undertaken a wide range of degrees, not necessarily those traditionally associated with future employment in the construction industry.

For the employer group, responses were based on managers' experiences of students working in their respective organisations who had recently graduated and were employed in construction roles.

Details of the study, the questions and methodology can be found in the third- year civil engineering project paper *Health and Safety in Construction – Improving civil engineering undergraduate teaching* by Rianaz Jainudeen and Thomas Keating-Fedders, University College London, 23 March 2017.

Survey methodology, limitations and approach to analysis

Data obtained from questionnaires

Prior to the analysis, considerable data cleansing took place e.g. to eliminate respondents who had completed non-UK based degree courses. The cleansing exercise resulted in a final data set comprising 890 respondents. An employer survey was then undertaken to provide an employer's perspective on the initial survey results. This analysis has focussed on respondents associated with the following qualifications and institutions:

Qualifications (with sample size shown):

- Construction Project Management (40 students, 17 employers)
- Quantity Surveying (36 students, 31 employers)
- Architectural degrees (42 students, 8 employers)
- Civil Engineering (367 students, 83 employers)

Institutions (with number of respondents shown):

- RICS (61)
- CIOB (48)
- IStructE (62)
- ICE (383)
- RIBA (21)

To allow comparisons to be made, outcomes have been extracted from the questionnaire responses and displayed in tables found in **Appendix One**. For ease of reference, each question has been given a reference number (shown in the first column of each table).

This paper has not drawn any conclusions or commented upon the methods of teaching health and safety at undergraduate level e.g. lectures, assignments, work placements or other methods used by individual universities etc.

From the data set, responses to 4 groups of questions were examined, as these align closely to the requirements set out in the JBM *Guidelines for developing degree programmes 2011 Annex D*. This document provides guidance for higher education institutions which are developing degree programmes and seeking JBM accreditation. Annex D provides guidance on health and safety risk management required by JBM to be fully integrated within engineering teaching and learning. A summary of annex D may be found in Appendix Two.

Responses were examined for groups of questions broadly in the following categories:

- Key legislation – HSW Act, CDM including knowledge of duty holders, MHSW Regs
- Key concepts – familiarity with key health and safety concepts such as harm, hazard and risk
- Key tools – confidence (in identifying hazards, eliminating and prioritising risk etc.)
- Key skills – practical skills (ability) in applying the tools in a practical sense at site level

Red flags

The percentage of respondents answering each question has formed the basis on which this analysis has been made. For the purpose of identifying matters of the most serious concern, the term "red flag" has been used, and where a red flag is warranted the relevant data in the tables has been highlighted in red. The original questionnaire did not use this approach.

Where respondents indicated they were either "*not aware*" or "*not very familiar*" with the subject matter, their % scores have been combined and the total shown. It has been assumed for the purpose of this review that the aim of undergraduate teaching should be to provide the student with

enough skills, knowledge or experience of a topic to enable them to rate themselves as being "*familiar*" with it. In simple terms, "*familiar*" is deemed to be an indicator of a desired outcome, whilst "*not aware*" or "*not very familiar*" are interpreted as shortcomings that need to be addressed.

Where the combined scored for "*not aware"* and "*not very familiar"* fall within the 80-100% range, a red flag has been used – to highlight an area of serious concern. Or to put it another way, if 20% or less have indicated they are *very familiar*, a red flag has been given.

Results Analysis

Construction related degrees versus non construction related degrees

Table 3. University suitably prepared the graduate for work in the construction industry - based on responses from students taking construction-related degree courses

Construction-related degree courses	% agree	% disagree	No of students responding
Architectural Engineering	61	39	13
Architectural Related	0	100	1
Architectural Technology	100	0	5
Architecture	19	79	42
Building Services Engineer	0	100	3
Building Surveying	43	57	7
Civil Based	57	43	367
Construction Project Management	58	43	40
Engineering Geology	22	78	9
Fire Engineering	50	50	2
Geotechnics	0	100	4
Other Construction Related	0	100	9
Quantity Surveying	50	50	36
Structural Engineering	70	30	20
Surveying	20	80	5
Totals	52	48	563

Comments on table 3

The top six construction- related degree courses (% of students agreeing that university suitably prepared them for work in the construction industry):

- Architectural technology (100%),
- Structural Engineering (70%),

- Architectural engineering (61%),
- Construction Project Management (58%),
- Civil based (57%) and;
- Quantity Surveying (50%)

The construction related degree courses which students' felt did not prepare them for work in the construction industry:

- Architecture-related,
- Building Services Engineer,
- Geotechnics,
- Surveying,
- Architecture, and
- Other construction-related degrees (unspecified).

Overall, from the 563 students taking construction related degree courses, just over half (52%) agreed that university suitably prepared them for work in the construction industry.

Is this an acceptable figure? The reasons are unclear (students were not asked to explain), but worthy of further investigation?

Table 4. University suitably prepared the graduate for work in the construction industry - based on responses from students taking non-construction-related degree courses

Non-construction-related degree courses	% agree	% disagree	No of students responding
Acoustics	50	50	4
Electrical and Electronic Engineering	33	68	40
Engineering (Unclassified)	36	64	22
Environmental Engineering	50	50	4
Environmental Science	50	50	6
Geography	31	66	29
Geology	47	53	17
Interior Design	0	100	2
Material Science	0	100	3
Mechanical Engineering	37	63	73
Not Construction Based	44	56	70
Planning	43	43	7
Renewable energy	71	29	7
Safety, Health and Environment	50	50	6
Transport Related	17	83	6
Totals	**39**	**61**	**296**

Comments on table 4

The top six non-construction related degree courses (% of students agreeing that university suitably prepared them for work in the construction industry):

- Renewable energy (71%),
- Safety Health and Environment (50%),
- Environmental Science (50%),
- Environmental Engineering (50%),
- Acoustics (50%) and;
- Geology (47%)

The most popular non-construction related degrees (based on the number of respondents):

- Mechanical engineering,
- Electrical and electronic engineering,
- Geography,
- Engineering (unclassified),

Should these degree courses be more tailored to the needs of those graduates entering the construction industry? If so, how might this be achieved, bearing in mind a proportion of graduates will pursue careers in other industrial sectors?

Construction related degrees overall comparison

Table 1 below shows how undergraduate course compared when students were asked to rate the importance of learning about health and safety at university, using a scale of 1(irrelevant) to 5 (crucial).

Table 2 shows how undergraduate courses compared when students were asked to quantify how much emphasis was placed on health and safety during their degree. A crude scale of 1(none) to 5 (a lot) was provided.

Table 3 shows how undergraduate courses compared in terms of the teaching of health and safety at university preparing individuals for the workplace.

Table 4 shows the total number of red flags given in this paper for student and employer responses.

Rank	Qualification	Importance of learning about health and safety at University - % of students scoring 4 or 5
1	Construction Project Manager	93
2	Quantity Surveyor	88
2	Civil Engineering	88
4	Architectural degree	55

Table 1. Importance of health and safety

1 (Irrelevant) → 5 (crucial)

Rank	Qualification	How much emphasis was placed on health and safety during your degree? - % of students scoring 4 or 5
1	Construction Project Management	40
2	Quantity Surveying	39
3	Civil Engineering	36
4	Architectural degree	10

Table 2. Emphasis on health and safety

1 (None) → 5 (a lot)

Did the health and safety teaching at university sufficiently prepare you for the workplace?		
Qualification	% of students responding "yes"	% of employers responding "yes"
Construction Project Management	58	24
Civil Engineering	57	22
Quantity Surveying	50	39
Architectural degree	19	13

Table 3. Prepared for the workplace

Qualification	Students	Employers	Total
Architectural degree	12	8	20
Civil engineering	4	13	17
Construction Project Management	2	15	17
Quantity Surveying	4	7	11

Table 4. Total number of red flags.

Comments:

Architectural degree students scored poorly in all four of the above tables. In particular with respect to how much emphasis students' felt was placed on health and safety during their degree (table 2), where only 10% scored a 4 or 5. When asked if the health and safety teaching at university sufficiently prepared the architectural student for the workplace, only 19% of students agreed (table 3). Architects top the table for red flags with students achieving 12 and a total number of 20.

Project management and civil engineering students appeared to prepare students better for the world of work than other qualifications, with students indicating high scores for tables 1 and 3.

From the students' perspective, Construction Project Management was the "top performer" across each of the areas covered by table 1, 2 and 3. It is worth noting that this qualification came out top for the number of employer red flags.

Teaching methods used at university – student's perspectives

Table 5. In what form were you taught about health and safety at university and rate this method of teaching. The % of students who rated this method of teaching health and safety as poor.

	Case Studies	Lecture series	One Lecture	Personal Study	Project work	Tutorials
Architectural degrees	42	61	38	44	48	56
Civil engineering	11	11	18	22	10	25
Project Management	9	6	9	6	15	16
Quantity Surveying	18	10	22	19	18	19

Comments on table 5

Looking at the lowest ratings – which method was rated the poorest for each degree course?

- Architectural degrees – lecture series (61% of students selected this method)
- Civil engineering – tutorials (25% of students selected this method)
- Project Management – tutorials (16% of students selected this method)
- Quantity surveying students – one lecture (22% of students selected this method)

Table 6. In what form were you taught about health and safety at university and rate this method of teaching. The % of students who rated this method of teaching health and safety as good.

	Case Studies	Lecture series	One Lecture	Personal Study	Project work	Tutorials
Architectural degrees	27	17	21	22	24	16
Civil engineering	54	56	37	30	55	33
Project Management	59	56	45	48	58	52
Quantity Surveying	39	41	26	26	32	23

Comments on table 6

Looking at the highest ratings – which method was rated the highest for each degree course?

- For architectural students – case studies worked best followed by projects
- For civil engineering - lecture series worked best, followed by projects
- For project managers – case studies worked best, followed by projects.
- For quantity surveyors – lectures series worked best followed by case studies

This appears to suggest that lecture series, case studies and projects were favoured by students across the degree subjects. It would be reasonable to assume that a "one size fits all" approach is unlikely to succeed; however, the challenge is ultimately to find the right blend of teaching methods.

For example, 56% of architectural students rated tutorials as poor, but if this method was improved significantly, it could still be an effective tool for teaching health and safety.

How could these methods be improved?

- by investing more resources (time/finance/staff/materials)
- revising the content (fit for purpose today, tomorrow and in the future)
- relevance to students' areas of study (to secure buy-in and retain interest)
- presentation/delivery (tutors require the right skills too)

Construction Related Degrees individual disciplines.

Construction Project Management (red flags)

Ability to:

- estimate hazards
- safely work in construction

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Concepts:

- Causes of ill health and injury
- Communicate risk to others on a project
- Decisions that influence risk
- Elimination of risk
- Estimation of risk

Legislation knowledge:

- duty holder roles and responsibilities under CDM Regs
- HSW Act
- MHSW Regs

Comments:

More than half (58%) of construction project management students believed they were suitably prepared for work. Students gave particularly positive responses on the ability questions indicating they were very familiar with causes of ill health and injury (60%), communicating risk to others (65%), on decisions that influence risk (63%), estimating risk (70%), eliminating risk (78%), familiarity with harm, hazard and risk (78%), and principles of risk prevention (80%).

Conversely, there is a notable difference in scores when comparing employer's views with student's views. Employers expressed a more negative view, suggesting that students were not as knowledgeable or confident as they believed. The answers to the ability questions are a good example. A comparison – showing the % of respondents who indicated they were very familiar with the topic – for student (S) and employer (E) samples, is shown below. This raises a question about the shortfall in knowledge – how is this to be made up to ensure employees can perform their roles effectively? Do employers have to invest in further training for staff to address this?

PM3.5 Communicate risk – 65%(S), 12%(E)

PM3.6 Decisions that influence risk – 63%(S), 6%(E)

PM3.7 Eliminate risk – 78%(S), 18%(E)

PM3.8 Estimate risk - 70% (S), 18%(E)

PM3.9 Harm hazard and risk – 78%(S), 29%(E)

PM3.11 Risk level in construction – 70%(S), 24%(E)

Quantity Surveying (red flags)

Ability to:

- estimate hazards
- safely work in construction

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Comments:

From the sample of quantity surveying students, 50% felt they were suitably prepared for work in construction, yet only 36% felt they could safely work in construction. Employer results were a cause for concern in relation to ability to work safely in construction with only 10% of the employer group very confident in their employees' ability.

Confidence questions also gave real cause for concern – for both student and employer groups, the answers were all red flags for estimating and prioritising risk, communicating risk, and knowledge of industry initiatives. However, scores were notably better when asked about concepts and legislation where generally scores were more impressive. Notable highlights, where students indicated they were very familiar with the concepts, were in relation to causes of accidents and ill health (61%), elimination of risk (61%), concepts of harm, hazard and risk (75%), and risk level in construction (83%).

How much emphasis was placed on health and safety during degrees scored highly, with 69% of students scoring this question "3" or above. From the employers' perspective Quantity Surveyors faired comparatively well in terms of their education at university preparing the student for the workplace. Responding to this question, 39% of employers agreed with the statement, and 26 % didn't know.

Architectural degree graduates (red flags)

Ability to:

- estimate hazards
- safely work in construction

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards
- Communicate risk to others on a project

Concepts:

- Decisions that influence risk
- Elimination of risk
- Estimation of risk

Legislation knowledge:

- duty holder roles and responsibilities under CDM Regs
- HSW Act
- MHSW Regs
- Importance of PD and PC under CDM Regs

Comments:

Only 19% of architectural degree students believed that their degree suitably prepared them for work. From the employer group, only 13% agreed. When comparing responses to this question across the four qualifications considered in this paper, these are the lowest percentages agreeing that students were suitably prepared. When estimating hazards, 97% of students were not confident or not very confident of their ability. Assessing their own ability to work safely in construction, 90% of students were either not confident or not very confident in this respect.

The scores for all questions assessing the student's confidence gave cause for concern (all red flags). This suggests more should be done in providing them with knowledge of hazards, how to identify and prioritise risk, explain risks and industry initiatives. The concept of risk was another area where students indicated poor understanding, particularly in decisions that influence risk and in estimating risk – for example, see the student responses to questions QS2.0, 3.1, 3.2, and 3.3. However, their overall understanding of the principles of risk prevention was good with 80% indicating they were very familiar with the concept. There is clearly a disconnect between the student's understanding of the concept and ability to apply it in practice.

Overall knowledge of the legislation gave cause for concern. CDM Regs scored the highest, where 24% indicated they were very familiar, but this is nonetheless a low proportion. Students were overwhelmingly not familiar or not very familiar with all the specific areas of legislation they were asked about, namely duty holder roles and responsibilities (83%), knowledge of the HSE Act (97%), MHSW Regs (100%), and importance of PD and PC in CDM (83%). The poor scores in these key areas are most likely a reflection of a lack of emphasis being placed on health and safety during their studies and this is confirmed by 74% of students scoring this question only 1 or 2 indicating that it was absent or minimal, and only 10% scoring this question 4 or 5 (see table 2) .

Civil Engineering (red flags)

Ability to:

- estimate hazards

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Concepts:

- Cause of ill health and injury
- Communicate risk to others on a project
- Decisions that influence risk
- Elimination of risk

Legislation knowledge:

- duty holder roles and responsibilities under CDM Regs
- HSW Act
- MHSW Regs

Comments:

The question concerning the individual's ability to work safely in construction produced contrasting results. More than half (57 %) of civil engineering students indicated they possessed the ability to work safely, but less than a quarter (22%) of employers agreed with the statement and 57% disagreed. This suggests that students may over-estimate their own ability and/or a shortfall in knowledge that employers needed to address in the workplace.

The responses to the ability question concerning estimation of risks and how to prioritise them (CE3.0) are a cause for concern. From the student group only 16% were very confident and from the employer group only 6% were very confident with their ability in this area.

Equally disappointing results are found regarding confidence to explain the significant risks in a piece of work (CE3.2). Only 17% of students and 10% of the employers group felt very confident. Employers had also indicated communication of risks to be a problem area with only 12% being very familiar with communicating risks on a project to others (CE3.5). The area of communication skills for civil engineering students may need addressing.

Results by Professional Body

RICS (red flags)

Ability to:

- estimate hazards
- safely work in construction

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Concepts:

- Communicate risk to others on a project
- Decisions that influence risk

Legislation knowledge:

- duty holder roles and responsibilities under CDM Regs

Comments:

There were conflicting outcomes for questions relating to risk. When questioned about their confidence to estimate risks and prioritise them (RICS 3.0), only 11% of students indicated they were very familiar with the concept. In comparison, when asked about their ability to eliminate risks (RICS 3.7) and estimate risks (RICS 3.8) the % of students indicating they were very familiar rose to 59% and 51% respectively. The % of students who were very familiar with harm, hazard and risk (70%) and the risk level in construction (77%) - were impressive. It was also noted that students' scores in the question set on confidence were all similar – suggesting that the real issue is perhaps one of lack of confidence to explain the topic.

For example, the % of students indicating they were very confident to explain industry initiatives with respect to health and safety risks (RICS 3.1) was 15%, confidence to explain significant risks relating to a piece of work (RICS 3.2) was 20% and confidence to estimate hazards (RICS 3.3) only 25%.

CIOB (red flags)

Ability to:

- estimate hazards

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Concepts:

- Communicate risk to others on a project
- Decisions that influence risk
- Estimation of risk

Comments:

In the question set addressing confidence with hazard and risk, employers expressed an overwhelmingly negative view.

Looking at the % of respondents who believed their staff were very confident:

CIOB 3.0 - Confidence to estimate risks and prioritise them – 8%

CIOB 3.1 - Confidence to explain industry initiatives re: health and safety risks – 8%

CIOB 3.2 - Confidence to explain significant risks relating to a piece of work – 15%

CIOB 3.3 - Confidence to identify hazards – 8%

At interesting comparison can be made with the results from the question set on ability. Looking at the students' results where respondents indicated they were very familiar with the topic:

CIOB 3.6 - Decisions that influence risk – 50%

CIOB 3.7 - Elimination of risk – 56%

CIOB 3.8 - Estimation of risk – 52%

CIOB 3.9 - Harm, hazard and risk – 65%

CIOB 3.10 - principles of risk prevention – 54%

Is the real issue one of confidence, and if so, how might this be addressed?

IStructE (red flags)

Ability to:

- estimate hazards
- safely work in construction

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Comments:

As with CIOB, in the question set addressing confidence with hazard and risk, employers expressed an overwhelmingly negative view. Looking at the % of employers who believed their staff were very confident – for questions IST 3.0 to 3.3 - not a single employer indicated they felt their employee was very confident.

IST 3.0 - Confidence to estimate risks and prioritise them – 0%

IST 3.1 - Confidence to explain industry initiatives re: health and safety risks – 0%

IST 3.2 - Confidence to explain significant risks relating to a piece of work – 0%

IST 3.3 - Confidence to identify hazards – 0%

ICE (red flags)

Ability to:

- estimate hazards
- safely work in construction

Confidence to:

- estimate risks and prioritise them
- explain industry initiatives re: health and safety risks
- explain significant risks relating to a piece of work
- identify hazards

Concepts:

- Communicate risk to others on a project

- Decisions that influence risk
- Elimination of risk
- Estimation of risk

Legislation knowledge:

- duty holder roles and responsibilities under CDM Regs
- MHSW Regs

Comments:

As with RICS, CIOB, and IStructE, when asked about confidence with hazard and risk, employers expressed an overwhelmingly negative view. Students responses also indicated a lack of confidence in this question set. The % of students (S) and employers (E) and who indicated they felt very confident – for questions 3.0 to 3.3

ICE 3.0 - Confidence to estimate risks and prioritise them – 14%(S), 6%(E),

ICE 3.1 - Confidence to explain industry initiatives re: health and safety risks – 9%(S), 5%(E),

ICE 3.2 - Confidence to explain significant risks relating to a piece of work – 17%(S), 9%(E)

ICE 3.3 - Confidence to identify hazards – 23%(S), 11%(E)

Of the other red flags, knowledge of duty holder roles and responsibilities under CDM is a potential issue. Less than a third (31%) of students and only 11% of employers believed their staff were very familiar with this topic.

RIBA (red flags)

Ability to:

- Estimate hazards
- Safely work in construction

Confidence to:

- Estimate risks and prioritise them
- Explain industry initiatives
- Explain significant risks
- Identify hazards

Concepts:

- Causes of ill health and injury
- Communicate risk to others
- Decisions that influence risk
- Eliminate risk
- Estimate risk

Knowledge:

- CDM Regs
- duty holder roles and responsibilities under CDM Regs
- HSW Act
- MHSW Regs

Comments:

On the ability questions, compared to the employer group, a lower % of students claimed to be very confident in estimating hazards – only 5% of students compared to 17% for employers.

Compared to the employer group, a lower % of students claimed to be very confident in being able to safely work in construction – only 5% of students compared to 50% for employers.

This pattern is repeated throughout the questionnaire – with a lower % of students claiming to be very confident or very familiar compared to the employer group. This appears to be at odds with many of the outcomes for other institutions (and occupational groups) where employers generally had a more negative view than students. This does not reflect well on student's recent experience of tertiary education providers. Examples included knowledge of CDM Regs - 29% students, 50% employers, indicated they were very familiar, roles and responsibilities under CDM Regs – 19% students, 33% employers indicated they were very familiar.

Conclusions / Recommendations

CONCLUSIONS:

Overall, from the 563 students taking construction related degree courses, just under half (48%) confirmed that university had not suitably prepared them for work in the construction industry. The survey revealed significant shortcomings in graduates' knowledge and ability – particularly on key aspects of OHS management such as those relating to hazard and risk. These findings do not reflect well on student's recent experience of tertiary education providers. Although limited in its scope, the report's findings do give evidence to the KPWC working group's concerns. In particular:

- Many construction graduates entering the world of work felt they were unprepared for understanding, assessing or controlling hazards and risks.
- The perceived importance of health and safety attached to learning at university varied markedly across the disciplines examined and there was lack of agreement from graduates on the best methods of teaching health and safety.
- Where health and safety is included within course content the results of the analysis suggest it may be outdated and unrepresentative of the modern world of construction practice, technology and innovation and is therefore falling short in terms of equipping students with the skill sets required for the working environment.
- Many graduates entering construction do so with degrees in "non-construction" disciplines such as geography or mechanical engineering and therefore lack the required health and safety knowledge.
- Graduates' rate their own ability significantly higher than industry employers. Employers generally considered students were not as knowledgeable or confident as they believed. This raises a question about how best to address potential shortfalls in knowledge to ensure employees can perform their roles effectively. In particular, the extent to which employers are required to invest in further training for staff to address the knowledge/skills gap.

RECOMMENDATIONS:

It is accepted that the purpose of undergraduate degrees is to provide a broad base of underpinning knowledge and that the role of educational establishments is to deliver this learning theory and equip graduates with the theoretical understanding and analytical skills required to embark upon a career in their given profession. Nevertheless, this report has identified potential weaknesses that need to be addressed and recommends dialog with relevant stakeholders to facilitate improvements to the teaching of health and safety at undergraduate level. In particular, the following actions are proposed:

- CLC/CONIAC needs to lead a wholesale review of how professional bodies, universities and employers can provide a more consistent appreciation of the principles and practice of construction risk management for students studying construction related degrees.

- For construction-related degrees, education providers need to ensure that adequate and suitable health and safety content is fully integrated into the syllabus, to ensure graduates entering professional roles within the construction industry have the up to date skills and knowledge they need for effective performance.

- A coordinated and aligned approach by industry, the institutions and education-providers is needed to address the variability and inconsistency in undergraduate training and ensure that employers expectations are understood and met. This will reduce the training cost burden on employers as graduates make the transition to the workplace.

- A suite of appropriate resources and other learning materials should be devised and made available, linked to agreed learning outcomes such as Annex D of the JBM specification (or similar for non-civil engineering degrees) to ensure a consistent approach. The learning outcomes and resources should be reviewed on a regular basis to ensure they remain fit for purpose.

- Further work engaging professional bodies and educational establishments is required to ensure that there is a coherent strategy for continuous improvement in the delivery and monitoring of occupational health and safety knowledge across the full spectrum of construction-related degree courses.

These actions are fully aligned with the broad strategic goals set out for those working in the industry – under the knowledge and skills agenda set out in the People element of the Construction Sector deal and within the CLC Roadmap to recovery (people and skills workstream) associated with FE, HE and industry reforms. Effecting positive change will require a coordinated response - the Construction Leadership Council (CLC), supported by CONIAC and the Keeping Pace with Change working group, is best placed to lead this important work.

APPENDIX ONE

DATA TABLES

Construction Project Management

(sample size: 40 students, 17 employers)

Ref	Question	Answers - % of respondents			
PM 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	58	43		24
	Employer	24	53		22
PM 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	20	63	83	18
	Employer	53	41	94	6
PM 2.1	Ability to safely work in construction				
	Student	15	43	58	43
	Employer	47	41	88	12
PM 3.0	Confidence to estimate risks and prioritise them				
	Student	15	63	78	23
	Employer	59	29	88	12
PM 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	33	53	86	15
	Employer	47	41	88	12
PM 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	23	53	76	25
	Employer	47	47	94	6

PM 3.3	Confidence to identify hazards				
	Student	8	53	61	40
	Employer	41	53	94	6

PM 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	3	38	41	60
	Employer	24	65	89	12
PM 3.5	Communicate risk to others on a project				
	Student	5	30	35	65
	Employer	35	53	88	12
PM 3.6	Decisions that influence risk				
	Student	5	33	38	63
	Employer	35	59	94	6
PM 3.7	Elimination of risk				
	Student	3	20	23	78
	Employer	18	65	83	18
PM 3.8	Estimation of risk				
	Student	3	28	31	70
	Employer	29	53	82	18
PM 3.9	Harm, hazard and risk				
	Student	3	20	23	78
	Employer	29	41	70	29

PM 3.10	Principals of risk prevention				
	Student	3	18	21	80
	Employer	x	x	x	x
PM 3.11	Risk level in construction				
	Student	3	25	28	70
	Employer	35	41	76	24

PM 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	13	35	48	53
	Employer	29	59	88	12

PM 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs					
	Student	13	40	53	48	
	Employer	41	47	88	12	
PM 4.2	Knowledge of the HSW Act					
	Student	10	35	45	55	
	Employer	29	59	88	12	
PM 4.3	Knowledge of MHSW Regs					
	Student	8	45	53	48	
	Employer	35	53	88	12	

PM 4.4	Importance of PD and PC under CDM Regs					
	Student	13	40	53	48	
	Employer	x	x	x	x	

PM 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	0	0	8	13	79
	Employer	x	x	x	x	x
PM 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	5	18	38	25	14
	Employer	x	x	x	x	x

Quantity Surveying

(sample size: 36 students, 31 employers) - % of respondents

QS 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	50	50		0
	Employer	39	35		26

QS 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	33	47	80	17
	Employer	55	42	97	3

QS 2.1	Ability to safely work in construction				
	Student	17	47	64	36
	Employer	26	65	91	10
QS 3.0	Confidence to estimate risks and prioritise them				
	Student	36	56	92	8
	Employer	68	29	97	3

QS 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	44	42	86	14
	Employer	65	32	97	3
QS 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	33	47	80	19
	Employer	45	52	97	3

QS 3.3	Confidence to identify hazards				
	Student	25	47	72	28
	Employer	52	45	97	3

QS 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	8	31	39	61
	Employer	6	52	58	42
QS 3.5	Communicate risk to others on a project				
	Student	11	39	50	50
	Employer	29	52	81	19

QS 3.6	Decisions that influence risk				
	Student	11	47	58	42
	Employer	23	52	75	26

QS 3.7	Elimination of risk				
	Student	8	31	39	61
	Employer	10	55	65	35

QS 3.8	Estimation of risk				
	Student	11	39	50	50
	Employer	23	48	71	29
QS 3.9	Harm, hazard and risk				
	Student	3	22	25	75
	Employer	3	52	55	45
QS 3.10	Principals of risk prevention				
	Student	8	39	47	53
	Employer	x	x	x	x
QS 3.11	Risk level in construction				
	Student	3	14	17	83
	Employer	3	42	45	55

QS 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar	
	Student	8	31	39	61	
	Employer	3	68	71	29	
QS 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs					
	Student	11	39	50	50	
	Employer	19	58	77	23	
QS 4.2	Knowledge of the HSW Act					
	Student	11	39	50	50	
	Employer	16	52	68	32	
QS 4.3	Knowledge of MHSW Regs					
	Student	19	53	72	28	
	Employer	29	48	77	23	
QS 4.4	Importance of PD and PC under CDM Regs					
	Student	14	47	61	39	
	Employer	x	x	x	x	
QS 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	0	6	6	44	44
	Employer	x	x	x	x	x
QS 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	3	28	31	28	10
	Employer	x	x	x	x	x

Architectural degrees

(sample size: 42 students, 8 employers) - % of respondents

ARC 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	19	79		0
	Employer	13	75		13
ARC 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	64	33	97	2
	Employer	63	25	88	13
ARC 2.1	Ability to safely work in construction				
	Student	40	50	90	10
	Employer	38	38	76	25
ARC 3.0	Confidence to estimate risks and prioritise them				
	Student	52	45	97	2
	Employer	38	63	100	0
ARC 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	74	24	98	2
	Employer	88	13	100	0
ARC 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	48	48	98	2
	Employer	50	25	75	25
ARC 3.3	Confidence to identify hazards				
	Student	43	55	98	2
	Employer	38	63	100	0

ARC 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	29	43	72	26
	Employer	38	38	76	25
ARC 3.5	Communicate risk to others on a project				
	Student	31	48	79	21
	Employer	50	38	88	13
ARC	Decisions that influence risk				

3.6					
	Student	26	57	83	17
	Employer	25	63	88	13
ARC 3.7	Elimination of risk				
	Student	31	48	79	21
	Employer	13	75	88	13
ARC 3.8	Estimation of risk				
	Student	36	50	86	14
	Employer	38	50	88	13
ARC 3.9	Harm, hazard and risk				
	Student	10	50	60	40
	Employer	0	75	75	25
ARC 3.10	Principals of risk prevention				
	Student	3	18	21	80
	Employer	x	x	x	x
ARC 3.11	Risk level in construction				
	Student	14	50	64	36
	Employer	25	50	75	25

ARC 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	36	40	76	24
	Employer	0	0	0	0

ARC 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs				
	Student	50	33	83	17
	Employer	0	0	0	0
ARC 4.2	Knowledge of the HSW Act				
	Student	45	52	97	2
	Employer	0	0	0	0

ARC 4.3	Knowledge of MHSW Regs					
	Student	60	40	100	0	
	Employer	0	0	0	0	
ARC 4.4	Importance of PD and PC under CDM Regs					
	Student	45	38	83	17	
	Employer	x	x	x	x	
ARC 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	2	12	31	38	17
	Employer	x	x	x	x	x
ARC 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	43	31	17	10	0
	Employer	x	x	x	x	x

Civil Engineering

(sample size: 367 students, 83 employers) - % of respondents

CE 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	57	43		0
	Employer	22	57		22
CE 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	26	59	85	14
	Employer	35	53	88	12
CE 2.1	Ability to safely work in construction				
	Student	18	53	71	29
	Employer	30	48	78	22
CE 3.0	Confidence to estimate risks and prioritise them				
	Student	28	56	84	16
	Employer	45	49	94	6

CE 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	56	36	92	9
	Employer	49	45	94	6
CE 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	27	56	83	17
	Employer	42	48	90	10
CE 3.3	Confidence to identify hazards				
	Student	18	59	77	23
	Employer	25	63	88	12

CE 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	x	x	x	x
	Employer	17	63	80	20
CE 3.5	Communicate risk to others on a project				
	Student	x	x	x	x
	Employer	29	59	88	12
CE 3.6	Decisions that influence risk				
	Student	x	x	x	X
	Employer	27	55	82	18
CE 3.7	Elimination of risk				
	Student	x	x	x	x
	Employer	16	65	81	19
CE 3.8	Estimation of risk				
	Student	x	x	x	x
	Employer	14	58	72	28
CE 3.9	Harm, hazard and risk				
	Student	x	x	x	x
	Employer	8	48	56	43

CE 3.10	Principals of risk prevention				
	Student	x	x	x	x
	Employer	x	x	x	x
CE 3.11	Risk level in construction				
	Student	x	x	x	x
	Employer	8	52	60	40
CE 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	x	x	x	x
	Employer	17	63	80	20
CE 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs				
	Student	x	x	x	x
	Employer	29	59	88	12
CE 4.2	Knowledge of the HSW Act				
	Student	x	x	x	X
	Employer	27	55	82	18
CE 4.3	Knowledge of MHSW Regs				
	Student	x	x	x	x
	Employer	16	65	81	19
CE 4.4	Importance of PD and PC under CDM Regs				
	Student	x	x	x	x
	Employer	14	58	72	28

CE 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	1	2	8	36	53
	Employer	x	x	x	x	x
CE 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	4	24	34	28	10
	Employer	x	x	x	x	x

The Institutions

RICS (sample size: 61 students, 39 employers)

RICS 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	56	44		0
	Employer	36	36		28
RICS 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	33	54	87	13
	Employer	51	44	95	5
RICS 2.1	Ability to safely work in construction				
	Student	13	51	64	36
	Employer	28	59	87	13
RICS 3.0	Confidence to estimate risks and prioritise them				
	Student	39	49	88	11
	Employer	64	31	95	5
RICS 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	46	39	85	15
	Employer	59	36	95	5
RICS 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	36	44	80	20
	Employer	51	41	92	8
RICS 3.3	Confidence to identify hazards				
	Student	26	51	77	23
	Employer	51	44	95	5

RICS 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	5	38	43	57
	Employer	10	56	66	33
RICS 3.5	Communicate risk to others on a project				
	Student	10	38	48	52
	Employer	26	59	85	15

RICS 3.6	Decisions that influence risk				
	Student	10	44	54	46
	Employer	23	59	82	18

RICS 3.7	Elimination of risk				
	Student	5	36	41	59
	Employer	8	56	64	36
RICS 3.8	Estimation of risk				
	Student	11	38	49	51
	Employer	23	49	72	28
RICS 3.9	Harm, hazard and risk				
	Student	2	28	30	70
	Employer	10	49	59	41
RICS 3.10	Principals of risk prevention				
	Student	7	39	46	54
	Employer	0	0	0	0
RICS 3.11	Risk level in construction				
	Student	2	21	23	77
	Employer	10	44	54	46

RICS 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	18	43	61	38
	Employer	15	64	79	21
RICS 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs				
	Student	23	48	71	30
	Employer	31	51	82	18
RICS 4.2	Knowledge of the HSW Act				
	Student	13	38	51	49
	Employer	31	41	72	28
RICS 4.3	Knowledge of MHSW Regs				

	Student	23	56	79	21
	Employer	36	38	74	26
RICS 4.4	Importance of PD and PC under CDM Regs				
	Student	23	48	71	28
	Employer	0	0	0	0
RICS 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)				
		1	2	3	4
	Student	0	8	8	30
	Employer	x	x	x	x

RICS 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)				
		1	2	3	4
	Student	10	25	31	25
	Employer	x	x	x	x

CIOB (sample size: 48 students, 13 employers)

CIOB 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	46	54		0
	Employer	15	69		15
CIOB 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	40	33	73	25
	Employer	38	54	92	8
CIOB 2.1	Ability to safely work in construction				
	Student	31	29	60	40
	Employer	31	38	69	31
CIOB 3.0	Confidence to estimate risks and prioritise them				
	Student	40	42	82	19
	Employer	54	38	92	8
CIOB 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	48	38	86	15
	Employer	54	38	92	8

CIOB 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	38	40	78	23
	Employer	54	31	85	15
CIOB 3.3	Confidence to identify hazards				
	Student	27	40	67	33
	Employer	38	54	92	8

CIOB 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	19	33	52	48
	Employer	8	62	70	31
CIOB 3.5	Communicate risk to others on a project				
	Student	19	38	57	44
	Employer	15	69	84	15

CIOB 3.6	Decisions that influence risk				
	Student	27	23	50	50
	Employer	31	54	85	15
CIOB 3.7	Elimination of risk				
	Student	19	25	44	56
	Employer	8	69	77	23
CIOB 3.8	Estimation of risk				
	Student	25	23	48	52
	Employer	23	62	85	15
CIOB 3.9	Harm, hazard and risk				
	Student	8	27	35	65
	Employer	15	62	77	23

CIOB 3.10	Principals of risk prevention				
	Student	21	25	46	54
	Employer	0	0	0	0
CIOB 3.11	Risk level in construction				
	Student	15	27	42	56
	Employer	15	54	68	31

CIOB 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar	
	Student	21	31	52	48	
	Employer	15	62	77	23	
CIOB 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs					
	Student	27	33	60	40	
	Employer	23	54	77	23	
CIOB 4.2	Knowledge of the HSW Act					
	Student	10	38	48	52	
	Employer	31	31	62	38	
CIOB 4.3	Knowledge of MHSW Regs					
	Student	25	42	67	33	
	Employer	31	31	62	38	
CIOB 4.4	Importance of PD and PC under CDM Regs					
	Student	29	33	62	35	
	Employer	0	0	0	0	
CIOB 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	0	6	13	23	58
	Employer	x	x	x	x	x
CIOB 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	25	23	19	17	17
	Employer	x	x	x	x	x

IStrutE (sample size: 62 students, 6 employers)

IST 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	53	47		
	Employer	17	50		33
IST 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	27	63	90	10
	Employer	17	50	67	33
IST 2.1	Ability to safely work in construction				
	Student	21	48	69	31
	Employer	17	67	84	17
IST 3.0	Confidence to estimate risks and prioritise them				
	Student	37	47	84	16
	Employer	17	83	100	0
IST 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	60	32	92	6
	Employer	33	67	100	0
IST 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	34	47	81	18
	Employer	33	67	100	0
IST 3.3	Confidence to identify hazards				
	Student	27	53	80	19
	Employer	17	83	100	0

IST 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	6	34	40	60
	Employer	0	67	67	33
IST 3.5	Communicate risk to others on a project				
	Student	16	35	51	48
	Employer	0	67	67	33

IST 3.6	Decisions that influence risk				
	Student	11	37	48	52
	Employer	17	50	67	33
IST 3.7	Elimination of risk				
	Student	6	29	35	65
	Employer	0	67	67	33
IST 3.8	Estimation of risk				
	Student	8	31	39	61
	Employer	0	50	50	50
IST 3.9	Harm, hazard and risk				
	Student	5	24	29	71
	Employer	0	33	33	67
IST 3.10	Principals of risk prevention				
	Student	3	35	38	61
	Employer	0	0	0	0
IST 3.11	Risk level in construction				
	Student	2	31	33	68
	Employer	0	33	33	67

IST 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	23	24	47	53
	Employer	0	50	50	50

IST 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs				
	Student	32	29	61	37
	Employer	17	50	67	33
IST 4.2	Knowledge of the HSW Act				
	Student	21	47	68	32
	Employer	17	50	67	33

IST 4.3	Knowledge of MHSW Regs				
	Student	31	48	79	19
	Employer	33	33	66	33

IST 4.4	Importance of PD and PC under CDM Regs				
	Student	37	27	64	34
	Employer	0	0	0	0

IST 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	0	8	8	30	54
	Employer	x	x	x	x	x

IST 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	6	37	27	26	3
	Employer	x	x	x	x	x

ICE (sample size: 383 students, 81 employers)

ICE 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	53	47		
	Employer	21	63		16
ICE 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	30	56	86	14
	Employer	40	49	89	11

ICE 2.1	Ability to safely work in construction				
	Student	21	53	74	26
	Employer	36	44	80	20
ICE 3.0	Confidence to estimate risks and prioritise them				
	Student	29	57	86	14
	Employer	53	41	94	6
ICE 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	56	34	90	9
	Employer	52	43	95	5
ICE 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	28	55	83	17
	Employer	49	42	91	9
ICE 3.3	Confidence to identify hazards				
	Student	19	58	77	23
	Employer	27	62	89	11

ICE 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	7	37	44	57
	Employer	22	57	79	21
ICE 3.5	Communicate risk to others on a project				
	Student	13	45	58	41
	Employer	35	53	88	12
ICE 3.6	Decisions that influence risk				
	Student	13	41	54	46
	Employer	32	51	83	17
ICE 3.7	Elimination of risk				
	Student	5	35	40	59
	Employer	17	63	80	20

ICE 3.8	Estimation of risk				
	Student	8	33	41	60
	Employer	16	58	74	26
ICE 3.9	Harm, hazard and risk				
	Student	2	20	22	78
	Employer	11	46	57	43
ICE 3.10	Principals of risk prevention				
	Student	6	31	37	62
	Employer	x	x	x	x
ICE 3.11	Risk level in construction				
	Student	3	24	27	73
	Employer	12	51	63	37

ICE 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	17	41	58	43
	Employer	20	47	67	33
ICE 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs				
	Student	30	39	69	31
	Employer	33	56	89	11
ICE 4.2	Knowledge of the HSW Act				
	Student	15	52	64	33
	Employer	19	57	76	25
ICE 4.3	Knowledge of MHSW Regs				
	Student	28	55	83	16
	Employer	33	53	86	14
ICE 4.4	Importance of PD and PC under CDM Regs				
	Student	32	37	69	31
	Employer	x	x	x	x

ICE 5.0	Importance of learning about health and safety at University Scores – on a scale of 1(irrelevant) to 5(crucial)					
		1	2	3	4	5
	Student	1	3	10	35	50
	Employer	x	x	x	x	X

ICE 6.0	How much emphasis was placed on health and safety during your degree? Scores – on a scale of 1(none) to 5(a lot)					
		1	2	3	4	5
	Student	5	27	33	26	8
	Employer	x	x	x	x	X

RIBA (sample size: 21 students, 6 employers)

RIBA 1.0	Suitably prepared	Agree	Disagree		Don't know
	Student	19	76		
	Employer	17	83		
RIBA 2.0	Ability to estimate hazards	(a) Not confident	(b) Not very confident	(a) + (b)	Very confident
	Student	57	38	95	5
	Employer	50	37	87	17
RIBA 2.1	Ability to safely work in construction				
	Student	33	62	95	5
	Employer	33	17	50	50
RIBA 3.0	Confidence to estimate risks and prioritise them				
	Student	33	62	95	5
	Employer	33	67	100	0
RIBA 3.1	Confidence to explain industry initiatives re: health and safety risks				
	Student	57	38	95	5
	Employer	67	33	100	0
RIBA 3.2	Confidence to explain significant risks relating to a piece of work				
	Student	33	62	95	5
	Employer	33	33	66	33

RIBA 3.3	Confidence to identify hazards				
	Student	29	67	96	5
	Employer	33	67	100	0

RIBA 3.4	Causes of ill health and injury	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar
	Student	29	24	53	43
	Employer	50	17	67	33
RIBA 3.5	Communicate risk to others on a project				
	Student	24	38	62	38
	Employer	50	33	83	17

RIBA 3.6	Decisions that influence risk				
	Student	19	52	71	29
	Employer	33	50	83	17
RIBA 3.7	Elimination of risk				
	Student	19	48	67	33
	Employer	17	50	68	33
RIBA 3.8	Estimation of risk				
	Student	33	43	76	24
	Employer	33	33	66	33
RIBA 3.9	Harm, hazard and risk				
	Student	5	57	62	38
	Employer	0	50	50	50
RIBA 3.10	Principals of risk prevention				
	Student	19	48	67	33
	Employer	0	0	0	0
RIBA 3.11	Risk level in construction				
	Student	19	38	57	43
	Employer	33	17	50	50

RIBA 4.0	Knowledge of CDM Regs	(a) Not aware	(b) Not very familiar	(a) + (b)	Very familiar	
	Student	29	43	72	29	
	Employer	0	50	50	50	
RIBA 4.1	Knowledge of duty holder roles and responsibilities under CDM Regs					
	Student	43	38	81	19	
	Employer	50	17	67	33	
RIBA 4.2	Knowledge of the HSW Act					
	Student	38	52	90	10	
	Employer	17	33	50	50	
RIBA 4.3	Knowledge of MHSW Regs					
	Student	48	48	96	5	
	Employer	50	17	67	33	
RIBA 4.4	Importance of PD and PC under CDM Regs					
	Student	33	43	76	24	
	Employer	0	0	0	0	
RIBA 5.0	Importance of learning about health and safety at University	Scores – on a scale of 1 (irrelevant) to 5 (crucial)				
	Scale	1	2	3	4	5
	Student	5	14	10	48	23
	Employer	x	x	x	x	x
RIBA 6.0	How much emphasis was placed on health and safety during your degree?	Scores – on a scale of 1 (none) to 5 (a lot)				
	Scale	1	2	3	4	5
	Student	29	33	24	14	0
	Employer	x	x	x	x	x

APPENDIX TWO

JOINT BOARD OF MODERATORS DEGREE GUIDELINES – ANNEX D (HEALTH AND SAFETY)

(Version 1 Revision 2 – 21 April 2011)

Context

The decisions individuals make in the execution of civil engineering projects have an impact on the health and safety of others. The impact will be on those who are directly or indirectly involved with the project throughout its life from design to demolition. Legislation puts duties onto all people involved in realising projects, and students must both understand the seriousness of these duties and develop a mind-set that enables them to fully discharge their responsibilities. However, in addition to statutory obligations, good safety risk management brings wider business benefit.

Aims

A thread of health and safety risk management running through the programme will enable students to become tuned to the need to manage health and safety risks and have a basic grasp of the practical application of risk management more generally.

Knowledge and understanding

The thread of health and safety risk management running through the programme should enable a student to:

- Understand the concepts of hazard and risk.
- Identify hazards
- Estimate the significance of risks by attributing severity and likelihood and be able to sort these risks in priority order.
- Understand how risks can be mitigated and the importance of communicating residual risks to others.
- Understand that all decisions, whether in design or construction, potentially have an impact on how safe a project is to build, operate, maintain and demolish.
- Be aware of key legislation relating to health and safety including:
    - The Health and Safety at Work etc. Act 1974
    - The Workplace (Health, Safety and Welfare) Regulations 1992
    - The Management of Health & Safety at Work Regulations 1999
    - The Construction (Design & Management) Regulations 2007
- Understand the meaning of competency of individuals and organisations
- Understand how changes on a project require a reassessment of risks.

Intellectual Abilities:

Students should be able to:

- Demonstrate the process of identifying hazards, estimating and prioritizing risks.
- Mitigating risk and managing residual risks and reviewing the risks in the light of the progress of the project - in the context of a design project or laboratory experiment.
- Use a famous failure case study to explain how things go wrong and the issues raised in this annex.
- Explain current industry initiatives in respect of health and safety risk.
- Explain what the unusual risks are on a piece of work and be able to distinguish these from ordinary or minor risks.

Practical skills:

The student should be able to:

- Undertake the elimination of hazards and reduction of risks (commonly called a 'risk assessment' from scratch for an aspect of project work (laboratory or field work) which documents the risks which are specific to the work.
- Conduct themselves appropriately when undertaking field or laboratory work

General transferable skills:

- Ability to think outside the box and challenge assumptions
- Teamwork
- Communicate skills.

References / Further Reading

Health and Safety in Construction – Improving civil engineering undergraduate teaching by Rianaz Jainudeen and Thomas Keating-Fedders, University College London, 23 March 2017.

RR925 - Healthy Design, Creative Safety - Approaches to health and safety teaching and learning in undergraduate schools of architecture