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Inter-professional collaborative learning for the enhancement of employability skills.

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Abstract

Inter-professional learning is an important part of professionally accredited courses which enables students to work with other disciplines on project based work to achieve academic learning and essential team working employability skills. With the need for graduates to be more work ready and leave their higher education as a professional it is important that cross disciplinary understanding is achieved in the safe environment of the University and modules such as these enable these attributes to be honed. Professional roles within the built environment are evolving at an unprecedented rate and to be successful within this industry requires graduates to possess developed inter-professional abilities.

This paper presents a case study of a module that has been delivered for 10 years and changed annually from reflection on the learning and student comments to provide greater engagement with the students. The case study is reviewed to enable best practice to be highlighted and a framework for future delivery to be developed.

Literature dealing with collaborative learning in the built environment is reviewed as are methods of team working and theory based models for team building and interaction. This enabled a deeper understanding of how teams work and form.

The findings centre on the impact of the difference interventions that have been introduced, on student engagement on the module. In particular students peer assessment data is used to evaluate the potential impact of the interventions. The data shows that there is likely to be an association between the interventions and student engagement on the module. This in many ways provides ground for module delivery teams to be clear of the anticipated implications

Introduction

The construction industry is becoming so large and complex that it requires experts to deliver specific parts of a project. As construction projects are made up of many different areas or specialisms it is imperative that they all align in order to deliver each project successfully. In order for this to be achieved the individuals in control of their specialisms must be able to work with each other in an efficient and collaborative manner



providing effective and positive interactions. To this ends the paper looks to explore the practicalities of delivering effective collaborative learning in the built environment.

The professional bodies accrediting courses in Higher Education seek to ensure that students emerge from their time at University prepared to perform at industry standard. This is done through their agreements with universities and also as part of their assessments of professional competence which courses have to be mapped to. Many Universities look to meet the collaborative learning, or group task, requirement through a project that remains within the student's discipline thus failing to meet the demanding requirements placed on students once they engage with industry.

Where team working is taught in single discipline cohorts the effectiveness of the interaction with opposing viewpoints is lost and consequently the skills needed to deal with these are not developed. True interdisciplinary working helps to develop negotiating skills and understanding of others perspectives leading to a more effective team member or leader. The delivery of successful inter-professional collaborative learning is key in the progression of students into successful careers and the establishing of structured learning programmes to incorporate the ability for cross professional learning within such courses is vital for the growth of the course and its recognition in industry.

The paper builds on the knowledge accrued from the paper written by a group from Herriot Watt University which considered the impact teaching collaborative learning to built environment students had on their employability skills. Within the construction industry employability is an important factor in choosing the right student for the role, by introducing students to collaborative learning in their curriculum they are able to hone their skills in a safe environment.

The paper will consider how academic integrity can continue to be upheld when teaching the practicalities of collaborative learning based on inter-professional interaction and the ability to engage with others to produce a significant and successful project.

The aim of this paper is to present a case study of an interprofessional studies module which the authors deliver to undergraduate built environment students. Of particular interest is the evaluation of the effectiveness of the different interventions the module team have introduced over the years.

Literature Review

According to Tennant et al (2015) there is a disparity between the emerging 'career academic' and the increasing demands for inter- and cross- professional training from the workplace. The reason given for the disparity is that the 'career academic' is by their nature tending towards specialism and discipline specific whereas industry needs to embrace all disciplines equally and enable them to work together in a cohesive manner. King (2010) in their narrative supports this paradigm by suggesting that global issues are becoming increasingly complex outstripping any one discipline and that in order to address such matters industry is looking towards teams of persons versed in different disciplines working together rather than individuals who might have a good interdisciplinary knowledge.

Nurturing these inter-professional skills both academically and practically is an important role or higher education if it is to maintain its rightful place as a provider of high quality personnel for industry and society as a whole. King (2010) continues by discussing the nature of academic faculties and how they can be brought together to provide opportunities for inter-professional working. This too can be related to the bringing together of different disciplines within the built environment sector of higher education. By bringing these disciplines together it is possible to use the specific skill sets of each discipline to inform the others and instigate a chain reaction of learning.

There is a challenge for aspiring professionals to use disciplinary knowledge to pick out salient features of an event or situation and then to infer what follows and how to act (Young and Muller, 2014 and Guile, 2014) says that. This can be developed through good inter-professional working practice delivered in successful projects set in the higher education environment. In order to enable students to use their knowledge projects need to be developed that rely on specific detailed knowledge to succeed but also need that knowledge to become aligned with that of others. There are occasions, according to Susskind and Susskind (2015) where conflict should be engineered in order to increase the learning of the students.

The professional bodies that govern the construction industry have close links to higher education and, in different ways, inform the curriculum that is taught at these institutions. They do this through the standard benchmarking, direct input into the curriculum and influence on the attributes expected of a professional graduate. The RICS (Royal Institution of Chartered Surveyors) allows universities more freedom in their curriculum but still expects graduates to leave with skills that align with its Assessment of Professional Competence (APC). The competencies that can be addressed through the inter-professional project in this aspect would be communication and negotiation (APC Competencies, 2014)

According to MacLaren et al (2016) there are several factors that need to be in place to enable collaborative practice which can be broken down into three main areas, those of Institutional Support Mechanisms, Working Culture Mechanisms and Environmental Mechanisms. Providing these are in place and sufficient guidance is offered to the students then successful collaborative projects can be delivered to enhance the student's subject area learning and inter-professional skills. From the observations made by MacLaren et al (2016) they suggest that collaborative projects are more likely to be run by staff who have a significant experience in industry enabling a practical understanding of the issues that might arise during the project work.

Research review and methodology

A case study used as there is a wealth of data available and the results of the discussion and recommendations from the paper can be implemented and reviewed in the module that the case study is based on to provide further study. The case study comes from a module delivered to the final year students with a mix of four cohorts, some of these cohorts have not worked with each other before, as such it has been considered appropriate for this module to become the case study.

Research method

Data collected from four years of the module was used. The four years were chosen as there have been interventions to the module in each of the three years and this has enabled external triggers to be aligned with the student response.



Interventions introduced in the module are designed to help improve students experience and engagement. In order to measure the effectiveness of the interventions, student peer assessment scores- a measure of students participation, was examined, with a primary aim of evaluating the potential associations between the interventions and the peer assessment scores. Generally peer assessment refers to a variety of approaches where students are involved in the assessment of the relative contribution of members in a group. Kennedy (2005). While there are a number of disadvantages that have been identified, such as existence free loaders (Parsons and Kassabova 2002), the inability of students to evaluate each other (Elliot & Higgins (2005); among others, it is generally agreed that students are in a better place to assess the contribution of other students (Baker, 2008; Visram & Joy, 2003).

Research results

Table 1 below presents a summary of the interventions introduced by the module team with year one used as a baseline year.

Year	Intervention	Triggers and explanation
1	<ul style="list-style-type: none"> • No Intervention [Baseline year] 	The project brief is based on a hypothetical construction site. Module team’s observation is that students find it less challenging as no real site-specific data can be attributed to the project
2	<ul style="list-style-type: none"> • The project brief is changed to be based on a real construction site 	It was considered that by using a real site students would be able to collect appropriate site-specific data. Such an approach would require a significant amount of student collaboration in determining the relevance of the data and design of a ‘real’ solution.
3	<ul style="list-style-type: none"> • Use of Belbin self-perception inventory at initial group formation stage • Requirement for a team building exercise 	The observation in year 2 was that there was a disparity between groups that bonded well and worked well in designing an integrated solution and those that did not. It was therefore felt that an intervention that helps students group to be effective were necessary. The two interventions were specifically designed for to deal with this.
4	<ul style="list-style-type: none"> • Mandatory and confidential peer assessment 	While the two interventions in year 3 had a desired effect on group performance and cohesion, it was observed that, in comparison to previous year, a significant number of student groups chose either not to do peer assessment or awarded each other higher scores that what the module team ought to have been awarded. It was therefore felt that, while in the past student groups could choose not to peer assess each other, peer assessment should be mandatory and confidential.

Table 2 shows the percentage of groups where all students attained a peer assessment mark of 24 out of 24 and at least 23 out of 24. The data shows that there is a potential linked between the interventions and student engagement as



measured by peer assessment scores. With the introduction of a more challenging task in year two, the number of groups with at least 23 PA scores for each group dropped from 83% to 73%. Having introduced the use of Belbin self-perception inventory and the requirement for a team building exercise, the PA score in year 3 is seen increasing from 73% to 85%. The biggest change in PA scores is however observed in year 4, where the large drop in the number of students groups with at least 23/24 PA scores for all students in the group, from 85% to 36% is observed and can be attributed to requirement for compulsory and confidential peer assessment is made.

Peer mark	Year 1	Year 2	Year 3	Year 4
Percentage of student groups with maximum PA 24/24 scores for each student	67%	64%	62%	36%
Percentage of student groups with PA of at least 23/24 score for each student	83%	73%	85%	36%
Average PA score for each student	23.26	23.86	23.24	22.45
Standard Deviation	1.24	4.33	2.07	2.48
Intervention(s)		<ul style="list-style-type: none"> • Changed brief to a real site 	<ul style="list-style-type: none"> • Use of Belbin group formation • Team bonding exercise 	<ul style="list-style-type: none"> • Mandatory peer assessment

In addition table 2 shows the average peer assessment mark for each year group along with the standard deviation of the marks for that year. It can be seen from the data that the standard deviation is higher for the last three years than in year one.

Discussion

The results show that following the first intervention of an actual site been used with all the additional material that was available to public access the challenge to produce a coherent proposal by the students increased and as such with little extra support from the module staff students with lesser abilities struggled. The change in brief to a real site provided the more adept students with a wealth of information and the lesser able students fell by as the teams did not gel in the early part of the project. The drop in number of teams with all students achieving at least 23 out of 24 PA score could be a reflection of the complexity of the task which now needed more collaborative effort by the students, in comparison to the previous year where the project was considered as less challenging.

Having identified the drop in peer marks the use of the Belbin Self Perception Inventory was brought in as an intervention to enable the students to understand better both their personal team traits and those of the other members. To compliment this intervention a team building exercise was made mandatory with a report back the following week. These two interventions have helped the teams to bond well. At this point it is likely that as the teams felt they were working well together they chose not to complete the peer assessments or chose to award each other the maximum PA scores. However observations made by the module team indicated that there were members of the teams who were not as effective as the peer assessments indicated. Upon completion of the module some students reported back that they felt under pressure to not complete the peer assessment forms by other group members where they would have liked to give lower PA scores to members that they considered to be underperforming.

It was also noted by the module team that students enjoyed the experience of working as a group once they identified each other's traits and had completed the team building exercise successfully. This effective team working could also have impacted on the peer assessment leading to perceived false high scores either being given or assumed due to the agreed non completion of the peer assessments.

The discussion with students led the module team to change the peer assessment to be compulsory and confidential. As can be seen in table 2, this intervention seems to have led to a reduction in number of groups that awarded all group members at least 23 out of 24 PA score. The increase in the reported variation in student contribution and engagement is one that can be considered as reflecting the input of the students as was observed by the module team. It is likely that the effect of the mandatory peer assessment led to the students taking time to objectively consider each student's performance in the project and it can be clearly seen that the average score of the groups dropped significantly.

Conclusion

From the discussion and data presented it can be seen that an effective team perceives their members to work well together and they build support mechanisms within the team where no one wants to openly criticise another member. When the individual team members are required to make objective considerations of each other's performance individuals become more critical of how team members performed. This leads to lower marks but also to individuals becoming more aware of how team members are performing rather than how they feel they are performing.

Given that the results of the peer assessment have dropped when it has been made compulsory mechanisms should be put in place to support the teams more during the project so that they understand their roles within the team. This support should look at interventions to ensure that all team members are effective and therefore gain the most from the experience.

The team project is intended to help the students gain the skills they require to transfer into the workplace, further research should be undertaken to identify the mechanisms that can be put in place to enhance the student's learning of team working from the module. These mechanisms can be related to all group work sectors to enhance the student experience of the project and help raise the employability skills of each student.



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