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## Case Studies

### Work-based Projects: learning about project management

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#### Introduction

Many IT courses include project management skills, which are considered important by employers; for example, a survey by Computer Weekly at the end of 2008 found that 'project management is the most in-demand skill among IT workers, topping the list at 64% of companies' (Savas, 2008).

Second-year undergraduate informatics students at City take either a 30-credit case study-based Team Project (TP), or an alternative Work-based Project (WBP) if they are on the Professional Pathway (PP). The PP scheme allows students to combine their Bachelor's degree study with four days a week in employment.

The WBP module was developed to utilise the learning opportunities available to students from working on real client projects. The WBP involves identifying and negotiating a significant piece of project work in the workplace.

Both modules require the student to produce the same deliverables: specification, design, testing documentation and implementation of a final workable software application. Both sets of students are expected to use UML (Unified Modelling Language) to design their systems and the same marking scheme is used to assess their work. On completion of the project, the WBP student is required to conduct a professional demonstration in the workplace to an academic assessor and his/her employer. In contrast, the TP student is only required to carry out a demonstration for his/her academic assessor.

#### Evaluation

The aim of this study was to compare the WBP module with the TP module in terms of differences in learning opportunities, richness of context, engagement, student results and both employer and student feedback. The comparison of the two modules was based on the following criteria:

- similarities in the learning outcomes (LOs) in different contexts and their achievement;
- differences in student results;
- students' understanding of project management concepts.

The LOs for both modules were the same although some of the WBP LOs had been adjusted to reflect the additional expected learning opportunities that arise in the workplace. All students who completed either module over the last three years were asked if they felt they met the various LOs of their module. The majority of students felt they had achieved all the individual LOs for both the TP or WBP modules, the only major difference was a significant number of TP students stated that the LO relating to working in a team – and completing work to a deadline – was met by them individually but not by other members of their team. WBP project students did not feel the same way because they had to deliver an individual piece of work completed in the workplace, but the context implies a 'team' of some sorts, such as the project supervisor, colleagues or testing team. The TP consists of an explicit team of student peers, whereas the WBP consists of an implicit team of workplace colleagues.

On average, students studying the WBP scored 10% higher than TP students (TP 64%, WBP 74%). Over the last three years, only 21 students completed the WBP compared with 481 students who completed the TP.

Owing to the difference in sample sizes, a 95% confidence interval for the true mean was constructed for both datasets. For the TP dataset, the 95% confidence interval was [62.6, 65.6]. Thus, with 95% certainty, we can conclude that the true mean of this population will lie somewhere between 62.6 and 65.6. Similarly, for the WBP dataset, the 95% confidence interval was [71.5, 83.3]. Therefore, since there is no overlap between the two confidence intervals, we can conclude that there is significant difference between the two sets of results and that WBP students will generally outperform TP students.

Working on and managing a large scale project like the ones tackled in both modules should help students to develop a good understanding of project management concepts. We asked TP students, WBP students and IT professionals to rate a set of project management skills in terms of their importance. Each individual was presented with ten different skills associated with project management taken from the British Computer Society's Skills For the Information Age (SFIA) Plus framework. Three of these skills were analytical thinking, business analysis techniques and project risk management. When comparing the average responses of students, we found that WBP student responses more closely matched those of the IT professionals in seven out of the ten skills areas. This demonstrates the match-up between WBP students and IT professionals and their understanding of basic project management concepts. TP

students more closely matched IT professionals in only three areas. Interestingly, one such area was project risk management: TP student responses were almost identical to those of IT professionals in terms of its perceived importance (very high), but they appear to be reflecting the risk of working with other students on a scenario-based project where a lack of contribution from group members leads to project failure or low grades.

To conclude, WBP students outperformed their peers academically when completing the same work, with the same deliverables and assessed by the same academics. They also demonstrated a greater understanding than TP students of project management concepts (i.e. reflecting more closely the understanding of IT professionals) and more WBP students felt they met all of the learning outcomes of their module. This study has therefore demonstrated the benefits of work-based learning and the benefits of developing key industry-specific skills (such as project management) in the workplace, especially when compared with the artificial case study options more commonly used today.

## References

SAVAS, A. (2008) Project management tops skills in demand at large firms, *Computer Weekly*, 23 September 2008, available at: <[www.computerweekly.com/Articles/2008/09/23/232408/project-management-tops-skills-in-demand-at-large-firms.htm](http://www.computerweekly.com/Articles/2008/09/23/232408/project-management-tops-skills-in-demand-at-large-firms.htm)> (accessed Feb 2010).

## About the author

**Mohson Khan** is a work-based learning advisor in the School of Informatics at City University, London. He previously completed a first degree in business computing systems at City University and then worked as a web application developer for three years. He currently supports and assesses students out on industrial placement and coordinates City's innovative Professional Pathway scheme, which enables students to combine one day a week study with four days in industry. Having completed a postgraduate certificate in online tutoring, he has recently embarked on a masters degree in e-learning at the University of Edinburgh.