ABSTRACT

The paper evaluates the impacts of using adaptive contemporary workplace methods for the enhancement of student motivation and learning, along with future employability. The interim effects of incorporating an ‘Agile’ project management approach within an established Activity-Based Learning strategy are considered for second year undergraduate students in Software Engineering and Computer Games Development environments. A range of observations and measurements are analysed to determine likely cause and effect relationships, supported by the university’s virtual learning environment, as a key communications component. The findings suggest that student motivation may be significantly enhanced through online access to interactive multi-media materials in support of an incremental facilitated learning strategy. In addition, local employer interest in graduate recruitment has been increased.

Keywords: Activity-Based Learning, Adaptive Contemporary Workplace Methods, Agility, Employability, Motivation

INTRODUCTION

When designing new education programmes academics need to ensure the academic cohesiveness of the content of a programme and to also incorporate subject specific skills and competencies the graduates need to acquire transferable generic graduate skills such as managing, a group project successfully, developing critical abilities for published work and for presentations, engaging in research activity, understanding the importance of the presentation of the findings, materials and results (written and oral), working collaboratively in a team and managing their own time and working to deadlines. Industrial placements, internships, projects based in industry have long been reported by many studies and reports such as (Archer & Davison, 2008; CPA, 2008) as successful mechanisms for student retention and employability.

Systematic initiatives at Middlesex University concentrated on active engagement by an industrial panel leading up to and during
the validation event for both undergraduate and Masters programmes (Georgiadou et al., 2008; Mitchell et al., 2008). For over 20 years all Computing and Engineering programmes at Middlesex include group work as an instrument of developing those vital generic transferable skills. Recent studies carried out in Finland, Greece and the UK reported in Georgiadou et al. (2006), Valtanen et al. (2009), and Valtanen et al. (2011) provide theoretical developments illustrated by case studies across institutions and cultures.

An industry collaboration initiative was developed (at Southampton Solent University) over a four year period with a number of local companies who engage in software engineering. Visits to each organisation were undertaken by one of the authors of this paper on a regular basis to observe working practices in a variety of contextual settings, and to translate these into case study scenarios for use within course delivery strategies.

Where organisations expressed a willingness to actively engage in the provision of case-study materials, filmed interviews were conducted and edited around key questions to support the learning and teaching strategy (an example is described in the next section). Specific links were created within the virtual learning environment to enable students to access relevant learning objects as support material at appropriate levels and stages within individual units.

**Background**

**Principal Case Study**

At the outset of 2010, a global healthcare company introduced an Agile information systems development strategy (SCRUM) in place of the existing traditional ‘waterfall’ method, and within a culture of ‘continuous improvement’. The ‘SCRUM-Master’ was interviewed on film at the end of 2010 and asked to summarise the effects of the experiment. An initial short pilot development programme was run on the SCRUM system initially to demonstrate the process to a skeptical team of two hundred analysts and developers.

A series of larger (Normal) scale projects were subsequently run throughout the year.

The tradition ‘Waterfall’ process involved a cascade of project phases leading to delivery of the requirements specification after six months typically:

- No stakeholder involvement was required beyond the initial briefing.
- Stakeholder requirements had normally changed by the delivery date, and there followed a series of modifications for a further unspecified period as a regular occurrence. (Described as ‘Ragged ends’)
- De-bugging the final system(s) took place in line with modification period(s) as new tests were implemented to ensure software quality standards.
- A six-month anticipated delivery schedule could easily exceed that timescale and budget by fifty per cent or more.
- By the end of November 2010 several projects had been completed using the SCRUM agile method, and the evidence suggested that:
  - Each project had been developed incrementally, with stakeholder involvement every two weeks to view the latest increment, and agree the next iteration specification.
  - More time had been spent talking to stakeholders, and discussing the development implications of new requirements than was previously the case. Talking time now represented approximately twenty per cent of the project, in contrast to previous methods, whereby a similar proportion would have been taken up by planning and administration.
  - System analysts and software developers were now empowered to take decisions for themselves as teams facilitated by a ‘SCRUM-Master, in place of the ‘Arranging and telling’ methods associated with past authoritarian project management strategies.
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