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MCLEAN, Simon

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USE OF INDUSTRIAL SIMULATION TO FACILITATE WORK BASED SKILLS FOR BUILDING SURVEYING STUDENTS, AN INTRODUCTION TO THE RATIONALE FOR RESEARCH

Simon Mclean [10]

BSc (hons), MA PGCE MRICS, Senior Lecturer in Building Surveying, School of Built Environment, Sheffield Hallam University

ABSTRACT

Research to establish pedagogy for imparting work based skills to students studying higher education courses in building surveying is being undertaken by the author at Sheffield Hallam University. An overview of the work thus far is provided. The pathway undertaken by typical building surveying industry entrants is outlined, along with the need for work based skills to be gained before employment commences. Research is based upon requirements expressed by the four stakeholders to building surveying education, (learner, education provider, employer and professional body). The rationale for provision of work based skills alongside academic learning is established. Use of a modified action research based methodology is proposed and justified, by reference to existing literature and the required research outcomes. Use of an enquiry based learning model using industrial simulation is proposed and justified. Factors influencing successful delivery of industrial simulations and enquiry based learning are identified, and the measures requiring to be addressed within any activity brief in order to prevent learner disadvantage are established.

KEY WORDS: Action Research, Industrial Simulation, Vocational Stakeholders, Scaffolding

INTRODUCTION

Access to a professional surveying career in the UK in the main requires the entrant to gain an accredited degree. This allows entry on to the Royal Institution of Chartered Surveyors (RICS), Assessment of Professional Competence (APC) programme. Completion of this programme then leads to becoming a Chartered Surveyor (MRICS). In the UK the degree would typically be a BSc honours or MSc in a surveying discipline. Some, but not all, students studying the BSc/MSc courses might experience some element of industrial experience before graduation. Graduates ideally go straight to a surveying employer, and embark upon their APC whilst working for that employer. The lead in time between being a student and being required to become a fee earning surveyor can often be short. As with other vocational degree programmes there is a requirement for surveying degrees to meet academic standards in teaching, assessment and programme outcomes. There is however also an employability requirement to provide graduates and placement students with some vocational skills. This allows an employer to charge a fee for their work as they are able to apply the knowledge gained during their studies.

[10] S.N.McLean@shu.ac.uk

USE OF ACTION RESEARCH TECHNIQUES

"Action research is the name given to a particular way of researching your own learning. It is a practical way of looking at your practice in order to check whether it is as you feel it should be. If you believe your practice is as it should be you will be able to explain how and why you believe this is the case; you will be able to produce evidence to support your claims. If you feel your practice needs attention in some way you will be able to take action to improve it and then produce evidence to show in which way the practice has improved." (Caniff & Whitehead 2002)

Action Research utilises the action, which in this case is an industrial simulation, to yield improvements and provide data. Thus the action becomes the research tool, (Waters-Adam 2006). A cyclical model of action research is described by (Arhar & Kasten 2001), consisting of 4 separate activities, planning, action, monitoring and reflection. Unlike this quite simplistic model the author also incorporated external data from primary and secondary research in to the reflection and planning stages of this research. This approach is endorsed by Stringer who states the importance of the participation of all of the stakeholders, (Stringer 1996). In this research input from the professional body and employers could only be obtained through separate primary and secondary research. Mcniff notes an important issue with action research is that it can be subject to variables, (Mcniff 1988). The author endeavoured to keep as many constants as possible, however in research which uses data from learner feedback the unavoidable variable was that the learner cohort changed annually.
A further purpose of action research in education is elaborated upon by Nixon, who states that the research is a way of informing other teachers within the specialism of practice improvements, (Nixon 1981), thus encouraging change and improvement to overall practice, (Mills 2003). As an ex-surveying practitioner teaching specialist surveying modules, this was an important factor to the author, as previous research in to teaching specialist building surveying vocational skills is scarce, and a documented pedagogy could inform and improve practice to the benefit of both education and practice.

STAKEHOLDER REQUIREMENTS AND MODULE OUTCOMES

In delivering surveying education the outcomes must satisfy a number of stakeholders. The first stakeholder was the university, who required that the degree in all its parts be delivered to a comparable academic standard to all its other degree programmes, is of a standard comparable with similar degrees offered by other institutions and fully meets the academic and quality regulations it lays down for degree provision. The second was the accrediting body the RICS who lay down regulations governing the content of the courses which they accredit for graduate entry on to the APC process. A third stakeholder was the surveying industry employers as without the realistic prospect of graduate employment vocational surveying courses would face decline. A final stakeholder was the fee paying learners. Module outcomes are generally pre-set, and any industrial simulation based assessment needed to pass both internal and external scrutiny so that it demonstrably met the academic requirements of module and level of study and were presented to students in a way which is consistent, fair and unambiguous, in line with quality regulations.

Advantages of the use of Industrial Simulation

Industrial simulation can be used as part of enquiry based learning strategy as an educational tool. Enquiry based learning, (EBL), is described by the Centre for Excellence in Enquiry Based Learning, as an environment where the process of enquiry is owned by the student. They go on to state that the process involves a scenario being set, supported by a facilitator, which allows students to identify their own issues and questions, (CEEBL 2009). Students would then utilise resources provided for them or sourced by themselves to research the topic. One feature of enquiry based learning is that it might, involve a small scale investigation involving field work and a case study adapted to meet the disciplinary contexts, (CEEBL 2009). Self directed learning as advocated by EBL is believed by many educationalists to be a superior form of vocational training in comparison to traditional teaching. The reasoning being a belief that that things a learner has discovered through experience are more likely to be retained, (Park et al 2003). In EBL the role of the teacher changes to facilitator, (Bradbeer 1996), Learning in the context of building surveying education should ideally include, academic outcomes, technical knowledge and practical vocational skills.

In terms of vocational skills training, industrial simulation exercises can contextualise prior learning in to an industrial context, (Khan & O'Rourke 2004), where it is of value to future employers. It reinforces past learning as the learner can test knowledge against a real life scenario. By using the knowledge to resolve problems the learner is afforded access to a whole new canvas for that knowledge, which gives it a greater value. It introduces the concept that learning is not purely restricted to the classroom or valid only within an educational establishment location. This form of learning would appear ideal when stated outcomes are the embodiment of key vocational skills. The use of a small scale simulated industrial exercise is cited by Khan & O'Rourke as ideal to focus learning directly in to a disciplinary context, (Khan & O'Rourke 2004). Conventional theory would it seems suggest that industrial simulation in the given context could deliver a dual outcome of general academic and specific vocational learning.

DEVELOPING A SUCESSFUL INDUSTRIAL SIMULATION EXERCISE

One danger of such exercises compared with traditional classroom teaching is that they can take students out of their established comfort zones, (CEEBL 2009). Whilst Nunnington views the challenge of this event as being the catalyst for enhanced learning, (Nunnington 2009), it can if handled poorly alienate students and detract from that learning. The student taken in to a challenge situation must therefore be supported. This support sometimes referred to in education text as scaffolding, is an essential factor. It must be visible and easily accessible, but also discreet, (Nunnington 2009). If not it might overshadow the industrial simulation element. Tosey, states the facilitator must, "intervene thoughtfully" (Tosey 2006). The author's experience following the running of many industrial simulations is that support on site should indeed be discreet, but still form a visible part of the simulation. This visibility allows the facilitator to exert some control, be on hand to render bespoke support, but not become the focal point which renders the simulation unrealistic. Support levels also need to be bespoke to the type of learner, and often to individual learners. One valuable scaffolding mechanism is peer group support by completing practical tasks in groups. This ensures that collective knowledge is brought to deal with any problem, and individual participants are not left isolated. Research in to scaffolding methodology forms a vital part of this research.
One issue is that Students traditionally expect to be taught and to have formal tutorial support, (Tosey 2006). The role of a facilitator is described by Tosey as being one who acts in collaboration with the learner in a cooperative enterprise within which leadership roles dependant upon time and purpose may change, (Tosey 2006). As direct leadership of all activities in EBL is sometimes not required, the use of an industrial simulation could be perceived by students as diminishing the role of the lecturer, (Askham 2009). Khan and O'Rourke speak of the need for the tutor to be seen to establish the parameters of the student's work and remain central to the whole activity, (Khan & O'Rourke 2004). One method of establishing the position of the tutor is by giving them a strong senior role within the simulation. This perception of the tutor as owning superior knowledge may be required to prevent a detachment between learner and teacher. These senior roles also allow the tutor/facilitator to nurture the participant students. (Tosey 2006). Establishing the balance between being both discreet and in control forms a vital part of this research.

Industrial simulation relies upon the learner owning adequate prior knowledge and having access to researched information pre-event, (Khan & O'Rourke 2004). The activity designer must ensure that the students actually own the required basic skills and can easily gain access to any additionally required information. This is a vital part of the imposed scaffold. Industrial simulation is about using skills, and the author has found it may be necessary to run demonstration activities, to achieve or at least test basic skill levels, or run classroom activities to embody critical information before exposing the students to the main event. This helps prevent detrimental levels of individual challenge. Facilitation of adequate skill levels, access to knowledge, information and data forms a vital part of this research
Whilst students will always be aware that the simulation is not real, and this is indeed another part of the support scaffolding in that potential failure does not carry industrial consequences, there is a need

for as much realism as possible. It is a small leap for a final year degree student to adopt the role of a newly graduated surveyor, but a huge leap to adopt the role of an experienced chartered surveyor. Likewise the tasks need to be totally commensurate with the role. For a case study to be viable the tasks need to be achievable, if they are not it would send out the wrong signals to the participant students, about the industry they propose to enter.

In summary a successful industrial simulation exercise needs to be well scaffolded, need the tutor to adopt a role as facilitator which does not diminish their effectiveness, requires realism to engage the students, needs to be bespoke to the level of the learner and needs to be fully supported by prior learning, prior skills training, current easily accessible supporting material and a physical tutor presence.

Specialist Work Based Skills for Building Surveying

Initial research in to skills required of a building surveyor, utilises the work of building surveying practice authors, previous academic research in to employer requirements for employability skills, RICS competency guidelines, as well as direct feedback from practice leaders. Hence ideal vocational skills for a graduate building surveyor were established. Consequential to this, the skills training brief became divided in to three parts. These are professional conduct whilst surveying, practical and technical surveying skills and professional report writing skills. The main underpinning skill is that of being able to focus recording and reporting towards the needs of an identified client, and being able to identify the impact of applicable statutory obligations to those client needs, (Glover 2009). Further data in respect of desired skills will be sought from practice leaders through further primary research.

CONCLUSION

The author intends to produce a pedagogy for delivery of a complete vocational building surveying education, to meet the requirements of four identified stakeholders. Analysis of learning approaches indicated that the most suitable teaching approach for imparting work based skills was EBL, through supported activities based upon an industrial simulation. The research methodology employed is that described as Action Research. Data obtained from evaluation of previous simulations drives improvements to future practice. This primary data is supplemented by data from literature and general feedback from other stakeholders. Using this approach the author has incorporated changes to the pedagogy employed in areas such as simulation design, scaffolding provision, provision of supporting material, establishment of the tutor's role within the simulation and organisation of the simulation event. Using an action research approach requires the practitioner to answer two questions. Is my practice as it should be, and can it be improved? (Mcniff & Whitehead 2002). Following a number of action research cycles the author must conclude that feedback from participants and from outcomes achieved suggest that practice has indeed improved, and is much closer to how it should be.

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