VIRTUAL WORLD — REAL STUDENT MOTIVATION?

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Abstract

This paper investigates a study into the adoption of a synoptic form of assessment across two units on undergraduate degree programmes. A study was conducted to examine ways in which these issues could be addressed so that students could identify a clearer relationship between the various units that they study, the relevance to their career objectives, and to enable a more diverse range of students to be accommodated within the assessment framework. The results of the pilot study will be discussed and some conclusions presented.

Introduction

Higher education programmes tend to be designed to offer life long learning skills across a range of disciplines in addition to equipping students with the specific knowledge and understanding appropriate to their chosen pathway, and these are seen as essential requirements for graduates (Watson & Taylor, 1998). Students may often report that they find it difficult to see how some of the units that they are studying not only relate to each other, but also how they fit into the overall pattern of their chosen degree, and to the corresponding career opportunities. Sometimes students are engaged in assessment activities that they see as not being relevant to real world situations.

Student diversity has also led to the need for academics to adopt more flexible, yet coherent, learning approaches (Palmer & Batola, 2006a). Thus addressing these issues with a holistic perspective may well contribute to improving student learning experience and motivation. A study was conducted to examine ways in which these issues could be addressed and also to allow students to identify a clearer relationship between their degree and career objectives.

This study combined both a synoptic and holistic approach to teaching, learning and assessment. The methodology involved linking units together by adopting a common or integrated framework scenario relating to a fictitious country, "Payland," complete with its own infrastructure, governmental and business organisations. Students are working for imaginary organisations that mirror those of the real world. For example they may be employed as consultants for a government department or a private company working on a particular project relating to the theme of the unit being studied.

It was hypothesised that the scenario would enable students to better relate their learning experiences, and the relevance of their learning, to the real world. Along with introducing the issues faced with the approach used, the study will examine the results from the academic viewpoint, and the impact of adopting this approach across a diverse range of students.

Background to the Case Study

Synoptic assessment often involves pulling together different elements of a subject under one form of assessment. This approach is advocated by the Qualifications and Curriculum Authority in the United Kingdom for post 16 education, particularly in relation to A levels (Patrick, 2005).

In the context of this study, our proposal is to take a scenario common to two or more units and assess them with similar types of assessment involving different themes depending on the focus of each unit.

Holistic learning is often defined as involving all the senses, mental and physical, of the learner (Oxford Brookes, 2007). Smith (1990) advocates learning with the whole mind, where curriculum should be designed to prepare students for career, citizenship and personal fulfillment. There is a need for people who can take charge, have the versatility to change and who care about the community. In the context of this study a holistic approach will involve looking at the problem as a whole and promoting the use of a variety of mental and personal abilities to approach the problem in order to provide solutions.

There are some important reasons why a synoptic approach has benefits. Firstly, in relation to the interface between undergraduate studies and the world of work.

Surveys have shown that most students see the importance of vocationally related programmes in developing their careers and job prospects (Newstead & Hoskins, 2003). Case studies are useful for vocational degrees where scenario based assignments allow the emphasis to be placed on the application of systems and techniques to specific real world scenarios rather than perhaps simply requiring students to recall facts that could have been copied from the Internet (Beatty, 2003). These programmes should also ensure that students have the problem solving abilities required by the world of work. Teaching and assessment should also encourage students to actively engage with the subject (Ramsden, 2003). Graduates possessing these attributes are more likely to be successful in their chosen occupation (Knight & Yorke, 2003). Dunn et al. (2004) emphasise the importance of oral presentations involving requirements and design in Engineering in developing skills in workplace communication. They also consider the ability to work collaboratively as being important.

Our increasingly diverse students also possess different skill sets. Concentrating on forms of assessment requiring a narrow skill set may disadvantage and de-motivate some students. Whereas allowing them to employ a wider range of skills may have benefits in facilitating improved learning and motivation, as well as developing skills required by the world of work.

The common integrated scenario at the heart of this case study is based upon a fictitious country called "Payland." In its current form Payland consists of a highly populated country with a mainland part and a number of islands of various sizes. It has a modern infrastructure that probably needs improving and modernising. Originally the scenario was developed for use on a single unit. However for the pilot study discussed in this paper we adopted this as a common scenario across two units covering students enrolled on a handful of technology related courses. The scenario is designed in such a way that any unit within a programme of study could take any part from it to use as a focus for teaching, learning and assessment.

A good scenario for this situation must be one that is not too specific to a particular unit, but contains sufficient level of detail that it can be used by any.

Background to the Students

The implementation of widening participation policies in higher education has meant that we are experiencing a more diverse student population. We have identified some of the issues faced with these more diverse student cohorts (Palmer & Batola, 2006a). We recognise that the educational, sociological and cultural backgrounds of our students are significant to the context of this discussion; however, other factors may also be significant.

Our experience has shown that some students can perform very well in practical laboratory based assessment, and their attendance at lectures is very good, yet they may perform less successfully in written examinations.

There may be a mismatch between the educational level of the work actually undertaken and that expected. It was noticed that some students seem able to be more reflective than others in their writing, with good analysis and discussion, whilst others tend to produce more low level documentation that may indicate surface understanding of the subject. However these differences may be due to previous scholarly experiences.

For some students their family culture or previous school experience might not encourage independent thinking and analysis. They may have been educated to understand that to do well means to expect to follow instructions without reflecting. These students may have a different understanding of the requirements

of academic work and may perhaps have further to go in their journey to acquire them.

There may also be cultural issues that give rise to diversity in learning style. Students from some cultural and ethnic backgrounds may not be well prepared to deal with the British Higher Education system in its current form. Perhaps teaching and learning methods that are better adapted to their background would be beneficial.

Students with lower socio-economic backgrounds are generally under-represented in higher education (Hayton & Paczuska, 2002), although the situation has improved.

Thus more students can face pressure from their family seeking to ensure that they achieve well in terms of career objectives. In some cases this has a strong motivating effect, although the additional pressure can also cause problems. If their studies are geared towards, and relevant to, these objectives then the students may be better motivated and able to achieve them due to the vocationally focused approach.

Gender differences can account for differences in learning style. There are fewer female students on engineering oriented courses, some have found the gender imbalance difficult and no doubt they can feel isolated. Nevertheless most female students appear to achieve well in comparison to many of their male peers.

Physically and sensory impaired students may have the same issues as any other student, with maybe additional complications. They may find it a physical challenge to participate in some forms of teaching, learning and assessment. Some students may have health issues that alter their studying ability. Course materials made available online and new technology can help.

We have observed that students with learning difficulties, such as dyslexia, can achieve well when given the right level of support.

It is likely that we may encounter students with other learning difficulties such as Autism or Aspergers Syndrome. These students would benefit from an approach that allowed for the use of situations familiar to them.

Some students are facing personal or family problems, sometimes due to emotional, mental or health issues, including sexual orientation and identity.

Many of our students are studying away from home for the first time and may find it difficult to adjust socially and mentally to this new environment, whilst at the same time facing the challenge of study over a sustained period. Perhaps a stable environment to which they can relate may lessen the confusion and conflicting threads in the complicated life of the student.

Overseas students may also face some of the above issues. With many overseas students not having English as their first language it is important to use clear English in the design of teaching and assessment material. They would also benefit from more visually based explanations.

Students often have to work part time to fund their tuition fees and cost of living expenses, and sometimes their work patterns cannot be changed to accommodate traditional academic life. On the other hand, some courses recruit part time students who are primarily engaged in a full time job. All of the teaching has to be allocated to one day to minimise workplace disruption.

Attempts to accommodate work time and academic attendance patterns, by proposing alternatives to conventional timetabled structures may be beneficial to working students.

Students may be faced with several issues and challenges among those identified. The issues may be complex and difficult to identify, nevertheless it would be beneficial if our teaching, learning and assessment strategy were able to cope with this and even feed off some of those issues.

We have a widely diverse range of students and any one assessment approach may give rise to issues, for example the reliance on a single examination. Perhaps a more flexible approach and one that allows students to relate their studies to the real world, which is where they see their future, and is a generally common goal amongst most, if not all, of them would be suitable. Such an approach to teaching, learning and assessment that has the flexibility to cater for a wide range of student abilities and issues; one in which at least some of these abilities can be applied with success is required. It was hypothesised that if students could see a real purpose for various concepts across the whole programme then learning ability and self motivation would be improved. The varying needs of students have to be accommodated whilst considering that they need to meet the requirements of assessment on a degree programme.

Practical Implementation of the Case Study

The scenario was originally used on a Communications Systems unit in the final year of undergraduate degree programmes involving students from electronic

engineering and computer networking courses. Currently it has also been adopted by a final year Network Management unit shared by computing and computer networking students.

Communications Systems Unit

This was the first unit to use a Payland scenario-based assignment, given at the beginning of the academic year, as a focus for learning and assessment. It is a third and final year undergraduate unit that looks at communications systems, with a particular emphasis on wireless based systems. The students on this unit are studying electronic engineering and computer networking degrees, and they need to understand electronic communications technology and specifications.

Students were given a list of twenty socially heterogeneous groups. Each group represented a sector of interest within Payland. For example groups of MPs, Public Health representatives, business representatives, or applied research scientists, etc. Each student had to select its target group and a particular sector of technology within the bounds of the Payland scenario.

For the first part of this two-part assessment students had to produce an executive summary, along with a series of technical information sheets and slides that could be used for a presentation to their targeted audience. For the second part they had to prepare a case study focusing on their particular technological sector and submit a comparative analysis report supported with a series of presentation slides.

The actual work to be assessed had to be prepared and presented on an individual basis. This method allowed the opportunity for peer learning. The assessment required the students to discuss how each of the technologies, for example satellite communications, cellular systems, wireless LANs, 3G and 4G could be of benefit to their chosen group. Therefore all students had the opportunity to learn about the different applications of each technology relating to particular circumstances.

Network Management Unit

Network Management is also a final year undergraduate unit that looks at the technical aspects of the planning and management of computer networks. A typical computer network manager must be capable of understanding all of the issues relating to gathering requirements for a new network, designing and implementing the network. They must also be aware of the management, monitoring and optimisation issues relating to existing networks, and must have an understanding of the technologies used in computer networks, along with the ability to understand important specifications.

This unit adopted the Payland scenario following minor modifications at the request of the unit leader to make it more generic. A short series of lectures introduced some of the basic concepts of network management. The students were issued with the assessment criteria for the unit in the first week. The assessment consists of a seminar paper and a seminar presentation based upon this. The students were expected to form themselves into small groups which may represent for example a company tendering for a contract, a group of consultants in an advisory role, or the technical department of a government body. Each group would then be expected to meet with the unit tutor acting in the role of a customer representative. Based upon an initial meeting at which the tutor would give an overview of the overall customer requirements the students were to prepare questions for subsequent meetings to establish detailed requirements for their own individual role. In its current version the unit is assessed on an individual basis so it was important for all members of the group to establish the requirements of their own individual task within the group. The group role was merely to add realism to the scenario, since the network specialists were more likely to be part of a team in the real world.

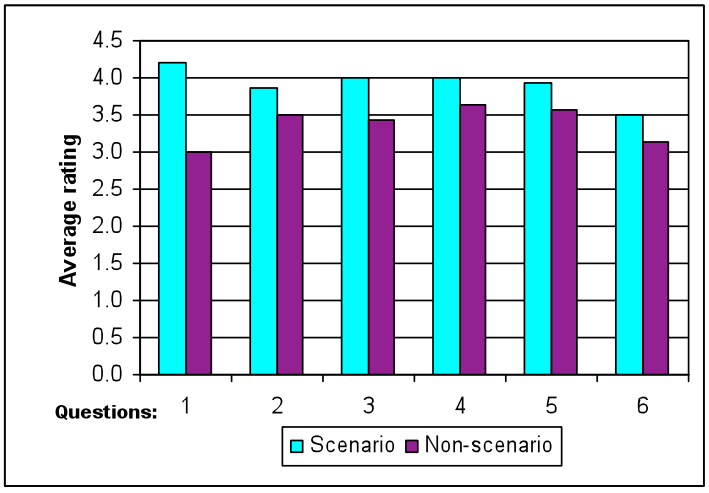
One typical scenario involved a group of three students working as part of a private company advising the taxation department of the government of Payland. The students were able to ascertain how many tax offices there were within Payland and the size of each. One student was given the task of modelling the network infrastructure and data flows, using network modelling software. Another student was tasked to investigate the security of the network, identifying any major threats and developing solutions. Some tasks involved mainly theoretical research, whilst other tasks involved a substantial amount of practical work. For example the third student was tasked to look at the use of wireless LANs within the taxation department. They could analyse in theory and by practical demonstration how simple security can be compromised and then demonstrate a secure alternative appropriate to the scenario. This approach allowed the students flexibility to choose a topic related to their own area of interest within the context of the learning outcomes of the Network Management unit.

As part of the assessment process students were expected to maintain records of their meetings with the tutor as evidence of the requirements gathering process, along with other supporting documentation such as preparation notes. The students would then document their research and solutions appropriate to the scenario in the form of a paper. Finally they were expected to present their finding to the group in the form of a seminar. In this way students would benefit from peer learning so that they could learn about the wider aspects of network management and not just their focused area of research.

Results

A questionnaire was issued to students on both units within the pilot scheme. Students were asked to rate their response, from 0 to 5, for six criteria. First of all did they think that the scenario based approach: 1.) relates their degree to the real world; 2.) assists with understanding of technology; 3.) is suitable for independent learning; 4.) enabled them to appreciate a wide range of technologies; 5.) benefits study; and 6.) motivates them. Then they were asked to rate their answers to the same questions relating to non-scenario based approaches, such as examinations, laboratory logbook, topic-based assignments, etc.

Figure 1: Students perception of scenario-based assessment versus non-scenario based



The results in Figure 1 indicate that in every aspect most students thought that the scenario based approach was better than a non-scenario based approach, in particular that it related their degree more to the real world than more traditional approaches (question 1). However some comments indicated that some students thought that practical laboratory work was also beneficial. This indicates that it would be useful to ask the students to compare the scenario based approach with laboratory work and also examinations and assignments separately in a further study. Some aspect of the importance of laboratory work in relation to vocational aims has been previously addressed in Palmer and Batola (2006b)

Students were also asked whether they preferred a single part assessment to a multi-part assessment such as the approach adopted by both units in the study. The overwhelming majority preferred multi-part assessment. This perhaps indicated that they did not like to put all of their eggs in one basket, preferring the holistic approach.

A further question asked whether the students were currently working or have worked. Almost all indicated that they have work experience. It does indicate that students have an awareness of work related issues and it may also indicate potential issues of conflicting pressures as we have identified.

At the time of writing the final unit performance results are not yet available for the two units in question. Initial indications seem to show that they are likely to be little different from last year, when the synoptic assessment approach was not used on the Network Management unit. However we were not necessarily looking for a quantitative improvement in results, but rather hoping that this approach would qualitatively improve the students' perception of the units and their relevance to career objectives. The student feedback seems to indicate that we have had some success in this respect, in particular this important objective. We felt that we could ask students to elaborate on some of their answers in future work.

Conclusions and Recommendations

When the Network Management unit was first run a few years ago students were required to undertake research and experimentation on a number of tasks through the year. However the course team, supported by feedback from external examiners, had determined that this tended to allow only a surface approach in the study of each topic, due to time and workload constraints on each student, although a wide range of issues could be covered. In subsequent years an in depth approach was adopted where students concentrated on one or two topics in detail. However feedback from students studying this unit indicated that, whilst they appreciated studying a topic of interest in depth, they struggled to appreciate the wider picture and the relevance or application of their topic to the real world.

The new approach has allowed greater linkage between topics within a common scenario so that students can better perceive the context of their studies and where they fit into the overall picture of the world. Students can learn from each other and better see the relevance of their studies to business and industry. Equipping students with these skills is seen as a major benefit to adopting this approach.

Further studies are required to evaluate and to implement how other units could benefit from adopting the integrated scenario, even if it is just used as the basis of a demonstration of application to the real world. Perhaps if our students live within Payland for all three years of their study they may be able to relate better to the subjects they are studying and may find it easier to grasp concepts by application. After all, students today are familiar with the concept of reality television. Teaching technological concepts can be challenging unless students are encouraged to apply them to a familiar model and further associated to their learning to improve their engagement.

Today the wide availability of resources on the Internet increases the risk of widespread plagiarism (Lathrop & Foss, 2000). If a unique scenario is employed for assessment it becomes ineffective for students to cut and paste existing generic material to answer assessment. The process and the product should form part of the assessment objectives. For instance, if the evidence of a requirements gathering phase also forms part of the assessment then the unreferenced reuse of this material is even more difficult. This encourages students to understand the technology better since they must do so in order to be able to apply it to the unique scenario.

One or two students commented that they felt that the scenario could be based upon a real example, however the danger with this situation is that students may be able to access and apply existing solutions without understanding how they were developed, and the issues just identified may also come into play.

Some approaches to assessment postulate that students should purely be assessed on the basis of the outcomes of research. The rationale may be to reduce student workload. Sometimes this involves a short report as the only deliverable. However unless the assessment criteria are designed carefully and explained clearly to students this may not allow students to employ all of their holistic skills to full potential. It can also make the task of judging the value of student work more difficult. On the other hand the approach adopted in which other factors in the process play a part allows a finer grained approach that makes it easier for staff to arrive at a fairer assessment of student work. Students have indicated that they prefer the latter approach and it probably makes the task of assessment less onerous for both students and staff in achieving the same learning outcomes.

This approach does seem to have met its objectives in improving the student perception of the relationship between undergraduate studies and the real world. Our diverse range of students seems to like this method, at least when compared to the more traditional alternatives. However, the continuous improvement of the scenario needs to be considered.

For various reasons there may be staff resistance to adopting a common scenario. At this stage it should not be something that will be imposed upon the teaching teams. Teaching staff should be free to opt in to use the scenario and take as little or as much as they like from it, even if they just use it as an occasional point of reference, perhaps to demonstrate where part of a unit can relate to a real world situation. Assessment need not necessarily be based on the scenario, even if it used for teaching and learning purposes.

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