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Remote online assessments within Food Science – does it breed student engagement?

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Abstract

ICT systems are commonly used within academic teaching and learning usually used as formative assessments and / or summative multiple choice examinations. Student engagement is a key driver of module development and ultimately secures student attainment within the course. The Student Employability Application Remote (SEAR) model has been developed to enhance the student experience within the food suite of programmes in Abertay. The model represents the use of remote online summative assessments which use innovative methods of assessment. The summative examination uses the application of knowledge provided by the student to write a report for a real life scenario, the student is encouraged to use a higher level of complexity to solve a problem. In addition to this problem solving, the student is tasked with a 'treasure hunt', where the student is asked within the two hour exam period to find three reliable sources of information for a selection of pathogenic bacteria. The student is then rewarded (if they use academic peer reviewed articles or governmental or accreditation body's websites) and penalised (if using news articles and encyclopaedia entries) as required. The model specifically links application of knowledge in remote online summative assessments with active learning and student engagement which drives the course development and employability of the learner.

Keywords: Food studies, remote online assessment, student engagement; student experience

Introduction

The use of ICT systems for student engagement, assessment and experience is a driving factor behind university and lecturing commitments. In the age of instant assess, students have been shown to enjoy the variety of online formative assessments, instant access to staff and resource material. Limniou and Smith (2014) determined the role of feedback on summative assessment and the use of ICT systems for this and concluded that the assessment allowed the students to perform a task, assess the outcome, receive individual feedback and reflect on it to improve their learning. Therefore the authors suggested that the group of students went from being a passive vessel of knowledge to mindful, reflective, active and independent learners (Limniou and Smith, 2014). With this idea students can reflect on what they do and how they do it on a regular basis.

Understanding the main barriers to online assessments has been previously categorised by Nix and Wyllie (2011), who explain that barriers to widespread use of summative eAssessments are wide, and assessed confidence as being a major barrier. The authors showed that confidence indicators in the use of formative assessment and feedback was a useful tool and was believed to be appropriate for its use (Nix and Wyllie 2011). Redecker and Johannessen (2013) further insisted that the old testing paradigm, which was a one way communicational experience, whereby the pedagogy affected the technology used, where pedagogy was used to advance teaching and learning ICT programmes for use in educational scenarios, the way that pedagogy has been used in the past. The authors provided evidence to suggest that the 'new testing paradigm' had technology leading innovation in teaching and learning; and that pedagogy was 'lagging' behind (Redecker and Johannessen 2013).

Student engagement is an important factor in the level of student performance, however, module design is deemed to be the most appropriate where the teaching encompasses all learning styles (Brown *et al.*, 2014). Web based learning systems are explored within the literature, where Katuk (2013) explored two different types of web based learning, fully-guided to partially-guided learning. The results suggested that student who underwent the fully-guided learning had a negative change in the engagement patterns, whereas students who underwent partially-guided learning exhibited a positive change in engagement patterns, although the author suggests more studies are required to validate this finding. The study found that the fully-guided learning activity instructions were not always engaging, where background knowledge was noted as an attribute to this (i.e. not flexibility for the learner). It was also discussed that to encourage engagement with the fully-guided learning experience activities should include a mechanism that requires or fosters engagement, or at the very least main its consistency. These types of activities are designed solely to encourage student led learning and encourages motivation (Katuk, 2013).

Similarly Vaughan (2014) described that to encourage student engagement within blended undergraduate courses, the design of modules to become active and collaborative learning experiences in which students have the responsibility of their own learning, which includes in some respects the validation of their own understanding through debate and peer review (Vaughan, 2014). Teaching fully online can become the norm within the academic community, Collins *et al* (2014) showed that to become an online course within the business ethics area, technology centralised the online course, where almost daily contact with students was given, including spreading the topic coverage over a week, which allowed more time for reflection, which benefited more introverted students. This type of course enabled these types of students to become involved in online interactions with peers and aided in the student learning retention (Collins *et al*. 2014).

It is argued that multiple forms of assessment and active learning pedagogies can engage students that offset the lower cognitive skills of surface approaches. Indeed, passive lecture-based courses with exclusive examination-based assessment have been shown to have negative or detrimental effect to learning. To combat some of these issues, active learning should replace passive lecturing, and study process questionnaires can be used as effective tools that should be used alongside other innovative teaching styles, it is thought that these types of questionnaire assess the impact of innovative teaching on the engagement and learning of the student (Bevan *et al*. 2014).

From the previous literature it is clear that to encourage student learning and engagement within the module / course, particular aspects need to be discussed, the level at which the learning is given, including flexibility to the learner, the environment that the student is provided with (both external environments and virtual environments) and any the application of knowledge or use of real life scenarios to deliver greater student engagement (Katuk, 2013; Collins *et al*. 2014 and Bevan *et al*. 2014).

FC0703A Food Hygiene and Safety

FC0703A Food Hygiene and Safety is the module for which the Student Engagement Application Remote (SEAR) model (Figure 1) has been developed for. This module follows the Royal Environmental Health Institute Scotland (REHS) Intermediate Food hygiene syllabus and lays the foundations of food microbiology, food poisoning agents including pathogenic bacteria, food spoilage (yeasts and moulds), preservation techniques, cross contamination and pest control. This module also introduces the student to Hazard Analysis Critical Control Point (HACCP) which is an industry standard used to risk assess the production of food products to ensure that the company / producer is producing safe food products. This module is a prerequisite and fundamental for the whole course and as well as the industry itself.

Proposed Model

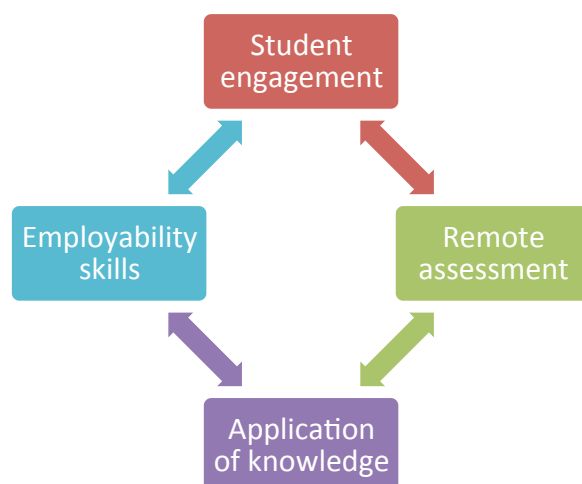


Figure 1: SEAR Model

Figure 1 shows the Student Employability Application Remote (SEAR) model designed to ensure that online assessment meets the general teaching and learning strategy as defined in Abertay's Teaching and Learning Strategy (2015). Remote on line assessments are hypothesised to increase the student engagement within the module (by incorporating new teaching and learning styles) and these types of exams can be made to assess the students application of knowledge (in a real world scenario). Both student engagement within the module and the application of knowledge, in a real world scenario, would increase the employability of the student through information gathering (providing the students understand what type of sources could / should be used). The career of the student is deemed to be industrially related and therefore the application of knowledge, rather than the regurgitation of knowledge are preferred. Linking into this is that knowledge of researching; including the decision making skills of the student (i.e. what is a preferred source and what is not), is part of the teaching and learning involved within the undergraduate courses.

The students in order to fully become employable should have the knowledge and skills to undertake the chosen career. Although the food and drink sector is a vast sector that incorporates many different and versatile job opportunities, the role of academics in full filling the obligation of student learning is to provide them with the correct skills to become employable.

Employability

Employability is a key graduate attribute; the courses at Abertay are tailored to enable the student to undertake critical thinking, experience industrial problems and assess strategy's to provide the student with key knowledge to progress in their chosen career. Students during their undergraduate (post graduate) studies should be exposed to a range of different assessments, including summative and formative assessments.

Assessments are key stages within the academic calendar that are devised as a way of assuring that the material given to the students is correctly understood and that they can relay that information back to the tutor. Grades are awarded and this is the fashion in which students achieve their degree and includes their classification. The pedagogy of assessments currently devised in many cases solely looks at the student being able to provide information back to the tutor in a question set, from multiply choice to essay styles (Collins *et al.* 2014)

Application of knowledge

In order to understand if a higher level of learning assessments can be devised to understand the students' capability of application of knowledge, and with this application breeds employability. The industrial nature of many of Abertay's degrees shows that students gain a certain type of experience at Abertay, this experience being linked with industry, and therefore will allow a straightforward assimilation into the working environment. Application of knowledge is a vital key graduate attribute that will allow employability within the work environment (Bevan *et al.* 2014).

When assessing students' ability to understand complex themes within the modular approaches of current Abertay systems, to assess the student on their knowledge is of a certain level implies that knowledge is only information. Therefore in order to turn information into 'knowledge' the student should apply the information into a real world scenario or understand the concept of using information as knowledge.

Student engagement

Student engagement within the module is of the utmost importance; engagement increases attainment of students, increases the students' awareness of the modular material and fosters lasting relationships with tutors. Student engagement directly feeds the overall experience of the student during their tenure at university. The highly competitive nature of the academic world, with more universities than ever before and each university offering the student certain experiences, greater choice breeds' competition, student experience needs to be understood. For Abertay to become a university of choice for studying, the student experience is an important factor, alongside world class facilities and members of staff, and industrially linked academic experiences. The student experience is that of how the student interacts, understands and enjoys the learning experience within the university in which they are studying. The current method of analysing this is through the National

Student Survey (NSS), where students are asked a series of questions ranging from academic to services (NSS, 2015).

Remote assessment

Formative assessments are currently used frequently throughout the academic discipline using various programmes and specifications, Blackboard being the main way of increasing student engagement within Abertay. Summative assessments using ICT systems are used less frequently, and tend to be in the area of multiply choice type questions that are used at a lower level to test the students' ability to soak up information. Multiply choice questions (in the belief of the researcher) are a great way of assessing the students learning through formative feedback and reflective activities, but are a poor choice for summative assessment. Multiply choice type examinations do not test the student understanding of a topic area; instead test the student's ability to repeat instructions or information given (Nix and Wyllie 2011; Redecker and Johannessen, 2013).

Remote examinations have been previously discussed (introduction section) and showed to be a useful way of assessing the students ability to reach academic rigor. Online remote examinations mean that students do not necessarily need to be within the university to undertake an examination. This negates the need for large specialist rooms with ICT systems that are potentially only used at particular times within the academic year.

The interactions of the model

Remote summative assessments are not entirely a satisfactory way of assessing student learning on its own. Coupled with application of knowledge, where students are encouraged to use the internet to gain answers for their questions (giving the sources and explaining why a particular source was deemed to be reliable) can form part of an assessment criteria that enables students to use the power of the internet to help them answer a real world scenario.

For example the question sets a scenario: they are a technical assistant within a food company, they have failed a hygiene audit. Certain things are not correct (i.e. the layout of the facility, the food product was not controlled correctly). The student is also told that the product they make was contaminated with a type of bacteria. The question asked them to write a report that explains what methods need to be put into place to prevent such a problem, including finding information about the bacteria (using three source of reliable information). The exam question involves a 'treasure hunt' type question, which will award students who use appropriate types of reliable sources (i.e. academic peer reviewed articles, governmental information sites and awarding bodies sites), they will be penalised using unreliable sources (i.e. news articles, none peer reviewed encyclopaedia entries etc.).

The interaction of this type of questions involves a different type of learning for the student, which encompasses teaching styles they would not entirely be familiar with. This encourages the engagement of the student within the module, as they are proposed an unfamiliar task with requires understanding of the knowledge area, which stretches the students and encourages them to fully understand the intricate detail of the modular work.

Because this exam type question is applying the knowledge in a real world scenario, this ensures that the students understand the industrial qualities of the material and therefore increases their employability within the sector. Working on real world scenarios enables the student to greater appreciate the interactions within the industry and gives them experience of working on industrially linked problems.

Conclusion

Using the SEAR model, the use of remote online summative assessments can be fully incorporated into food hygiene and safety modules to foster key attributes for the students' career. Employability is a large part of the attractiveness of the food programmes of study in Abertay and therefore requires innovative methods of assessments that are in-line with the Abertay Teaching and Learning strategy, but more importantly increase or sustain student engagement through active learning.

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