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6 The development, implementation and initial evaluation of tailorable resource packs for multimedia based “assessments for learning”

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Abstract

In this project a suite of tailorable teaching and learning resources were created, implemented and evaluated. These resources focused on the assessment for learning model, adopting the constructivist approach to learning. Here, the student builds their knowledge, and deepens their understanding, as they complete their assessment. The resources were designed to aid academic adoption, and student implementation, of this model of assessment. The assessment outputs created using these resources were digital videos and network concept maps. The tailorable resources provided a structured and scaffolded environment for both the academic and student to explore this learning space. Both students and academic staff, as part of an explorative case study, evaluated the resources. In terms of the resources created for video-based assessment, students were happiest at times that correlated with the use of the resource pack and commented that the resources assisted them in creating their assessment for learning product. Finally, recommendations for practice are offered and suggestions are made on how to holistically integrate this approach on an Institute-wide scale.

Keywords: assessment for learning, digital learning, emotions of learning, student as producer

Introduction

Background context and rationale

Assessment is an inescapable aspect of many educational environments and is known to be one of the key drivers of learning (Hubbard 1997). Assessment can be viewed as a hurdle over which a student must prove they can jump to demonstrate their learning. Alternatively, assessment can be viewed as a rung of a ladder whereby students can use their assessment as a means of deepening their understanding; subsequently exhibiting their learning and climbing the ladder of subject mastery (Ryan 2013a). In the latter approach, assessments are for learning, not of learning. Coupling assessment for learning with real-life, authentic scenarios and specific peer and academic feedback and -feedforward greatly enhances the student learning experience (Shepard 2000; Nicol and Macfarlane-Dick 2006). Additional inclusion of technology into the assessment melting pot offers further possibilities such as adapting to the specific learner's style, pace and learning needs (Cope et al. 2011). Use of multimedia allows for the development of rich, portfolio-based assessments and reaches out to the digital natives and migrants that occupy the lecture halls of every educational institute (Prensky 2001). To effectively complete a multimedia-based assignment students must analyse and synthesise several multimodal sources of subject content. The student must then brainstorm, storyboard and create. This process is repeated several times and each time the student refines, not only their product, but also their understanding of the content. This ultimately leads to increased student engagement and deeper learning.

Project objectives

The aim of this Teaching Fellowship was to develop a suite of resources to encourage and enhance the use of multimedia in student-centred assessment for learning. The resource pack is downloadable as a tailorable solution that can be adapted by the academic to suit the relevant subject area. Additionally, information on the alternative uses for these resources can be found in the case studies and brief review of the literature that supplements the hands-on resources.

Pedagogical and personal benefits: students and academics

The use of the resource pack facilitates both students and academics in the creation, application and assessment of student-centred creative and engaging continual assignments. Integrating multimedia into the learning journey will help the student to develop tangible life-long skills and key employability traits such as collaboration, meaningful student interaction, enhanced communication proficiency, project management skills, peer co-operation and autonomy (Robin 2008). Furthermore, embedding multimedia in this way promotes assignment evolution towards an assessment for learning and thus process becomes a student-orientated, social constructivist activity where the student(s) take ownership of their project and become responsible for the product and, subsequently, their learning (Harel and Papert 1991).

The project was divided into two main sections; production of the resource packs and their evaluation. Two themes were chosen to form the basis of the multimedia-based assessments for learning – video and networked concept maps. Resources were created for each theme and were a mixture of interactive, online resources, downloadable files and worksheets. These included narrated screencasts detailing the use of appropriate technologies, editable Word documents, grading rubrics and suggested timelines for implementation. Tables 6.1 and 6.2 detail the resources created, split into resources for the academic and resources for the student.

The second part of the project was the evaluation of the resource packs created. The modules chosen for the evaluative case studies were Introductory Biochemistry (TFCH2001; second year honours degree) for the video assessment resources and Advanced Topics in Nutra- and Pharma-ceuticals (TFEL4001, final year honours degree) for the network concept map resources. For the sake of brevity, only the student evaluation of the video assessment resources is detailed here. Evaluation followed best ethical practices and conformed to the Institute's Research Ethics Guidelines. Data were collected in several forms: anonymous multiple-choice questionnaires, independent academic facilitated discussion fora before and after the use of the resources, anonymous standard institute module review forms, and a personal researcher reflective diary. Qualitative data were coded into several key themes and sub-themes based on researcher interpretation influenced by Strauss and Corbin's (1990) Method of Constant Comparison. Quantitative data were analysed using relevant statistical functions within Excel. Furthermore, discussions with stake holders following dissemination both nationally and internationally, critical reflection with a "critical friend" and other academic staff members provided a broader, balanced and rounded evaluation of the resources.

<i>Academic resources</i>	
1	How to prepare students for a video assessment
2	How to align an assessment <i>for</i> learning to a traditional lecture course
3	How to provide feedback/feedforward for students during the assessment
4	How to grade a student-produced video resource
5	How to prepare and conduct pedagogical research based on the use of video
<i>Student resources</i>	
1	How to effectively brainstorm
2	How to storyboard collaboratively
3	How to plan a video shot
4	How to simply edit video content
5	How to privately upload video to a social media site
6	How to write reflectively after a leaning experience

Table 6.1: Resources developed, divided into academic- and student-appropriate categories, for video-based assessment for learning

<i>Academic resources</i>	
1	How to prepare students for a network-map-based assessment
2	How to prepare students for a network-map-based assessment
3	How to provide feedback/feedforward for students during the assessment
4	How to encourage peer interaction and feedback
5	How to grade a student-produced network map (final product and process)
<i>Student resources</i>	
1	How to effectively brainstorm as an individual within a group
2	How to network-map collaboratively and individually
3	How to use technology to enhance a network map
4	How to write reflectively after a learning experience

Table 6.2: Resources developed for networked concept maps implementing the assessment for learning approach. The resources are divided into academic- and student-appropriate categories

An explorative case study was conducted to investigate the perceived benefits of the use of video-based assessment in a second year introductory biochemistry module (TFCH2001) and the use of networked concept mapping in an advanced final year optional module (TFEL4001). As part of this explorative study the students perceived use of the resources, along with the academics' personal reflective writings during their use, informed whether the project outputs were successful in achieving their goals at a local level.

The use of video as an assessment for learning was, in general, appreciated by the students. However, the preconception that students are digital natives, or even digital migrants is questionable. It may appear from the outside looking in that students exist in a social-media-driven, technology-enhanced world and are well versed in the pervasive technologies. This study aimed to align the instant gratification, always-on technology-driven student with the slower paced world of scholarly activity and deep understanding (Welton 2011). In previous attempts to achieve this in similar modules, students struggled with the technological aspects of the assessment. Before commencing this assessment (the creation of a short video on a biochemical topic of choice) over three quarters of the students surveyed (n=100) commented that they were not "confident with technology". These students noted that they could use common software (e.g. MS Office) and social-mediabased technologies (e.g. Facebook and Twitter being the most cited); however, they struggled when asked to apply their technological knowledge to a new task (e.g. video editing software) and this resulted in fear and anxiety.

This led to a secondary research topic, the emotions of learning. In an aligned study (Ryan 2013b) it was noted that students' emotions oscillated from happy to unhappy depending on what aspect of the video-creating assessment they were carrying out. In general, students were least happy when they were carrying out the technological aspects of the project. The resources created as part of this Teaching Fellowship aimed to address these difficulties. This additional technical support was provided to the students, particularly in relation to the editing of digital video, as a "just in time" resource; i.e. access was provided when the students needed assistance (based on their project timeline). The resources took the form of screencasts of selected free-to-use software demonstrating the basic functions and methods permitting the students to asynchronously learn and use the editing software. Students could then explore the capabilities of each editing software tool at their own pace, but every student could be confident in carrying out basic editing. In comparison to the aligned study, the use of these resources dramatically reduced the negative emotions noted at technology heavy points of the project. Anonymous student evaluation, conducted through online survey, noted improved student happiness at the most technologically challenging time point of the project (weeks 6–9). This time frame coincided with the video-editing tasks and uploading the final product to the hosting website. In the aligned study these aspects were cited as the most challenging to the student technical skills and hence, the Teaching Fellowship Student resources focused on these tasks. In the student discussion fora students commented that they watched and re-watched the resources several times before and during the

relevant tasks. They noted the benefit of being able to pause, rewind and re-watch the more technically challenging aspects and the scaffolded and timely release of each resource allowed them to concentrate on one aspect at a time. Despite the positive reflections from the students on the use of the resources, some noted that those with more experience in computerbased technologies found it easier to adapt to the new technologies experienced in this project. Overall the students did note the benefit of being exposed to new and alternative technologies that may not be directly linked to their perceived future careers. In general, students reflected that this exposure helped to remove their personal fear of using new technologies and made them more willing to try something they are not familiar with.

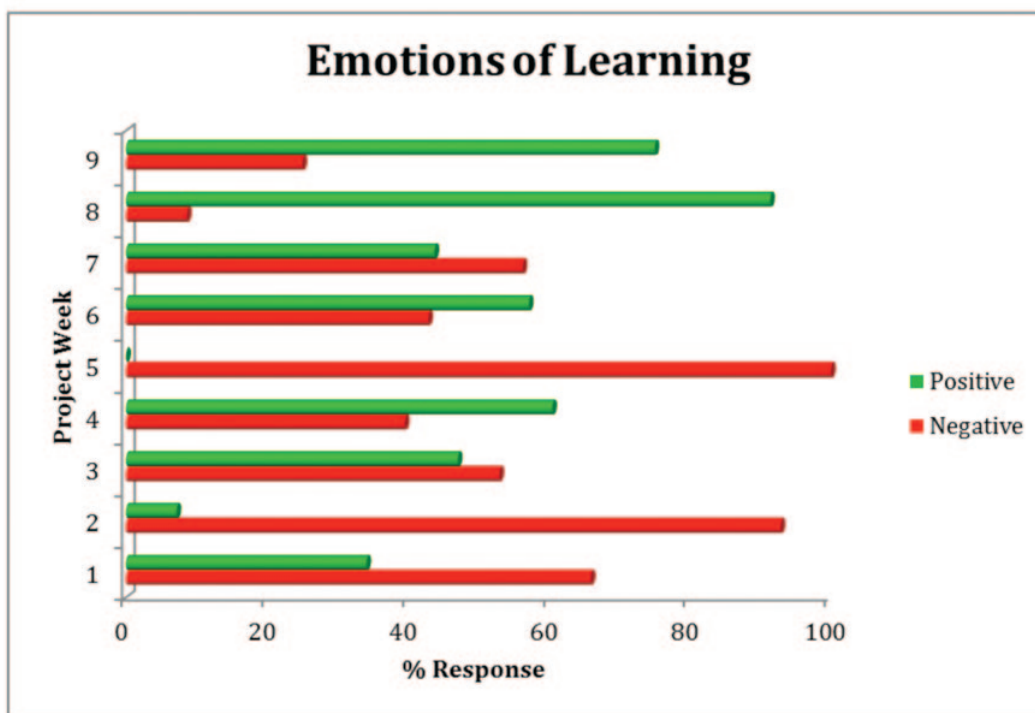


Figure 6.1: TFBC2001 evaluation of the emotions of learning

Note: Students were surveyed anonymously via SurveyMonkey, based on Walker’s (2013) Emotional States Assessment Technique. Participation was voluntary and Week 5 is noted as an anomaly as only one student responded. On average 11 students responded per week. Video editing began in Project Week 6 and progressed until Project Week 9.

Recommendations to DIT

This project aligned to many of the Institutional policies as highlighted in the DIT Teaching, Learning and Assessment Strategy 2011–2014 and, as such, there are several Institute-wide recommendations detailed under the Strategy headings.

- **Curriculum**
Curriculum development was central to this project and the outputs can directly assist both academics and students in following formative and summative assessment strategies both for learning, and of learning. These outputs can be used to offer an alternative approach to assessment, which centralises the student and promotes deep learning.
- **Teaching excellence**
All aspects of the project (resource development, implementation and evaluation) were based on best pedagogical practice grounded in research and peer reviewed literature. This will enhance the best teaching and learning practice and may form a springboard for future collaboration and development within the Institute.
- **Development of key skills and competencies**
Central to this project was the development of key “soft skills” by students during the use of the project resources. These key skills, such as project management, communication, negotiation, are highly sought after by employers. By using the scaffolded student resources (or the model of scaffolding student learning through assessments for learning), students can become autonomous learners capable of working both alone and within a group dynamic.
- **Diversity of learning opportunities**
Multimedia-based assessment for learning potentially offers a wider range of learning experiences and encourages participation from a diverse learner background. This will also allow students to diversify how they learn and encourage the student to take responsibility for their own learning.

- External and internal engagement
The digital videos produced by students were showcased to Leaving Cert Biology students from a local secondary school (Larkin College) through a Students Learning With Communities initiative. These digital videos were used as reusable learning objects to enhance the scientific understanding of the secondary school students, to increase their awareness of the sciences in general and to view DIT as a potential avenue to further their education. Creating a real-life, authentic assessment for learning that had a real-life target market gave gravitas to the project for the students. They felt very proud of their products and volunteered to showcase their work to the Leaving Cert students. This fostered an ad-hoc community of practice, “students of biology”, as the DIT students were studying fundamental biochemistry that aligned to, and built on, many aspects of the Leaving Cert Biology course.
- Feedback and feedforward
A key aim of this project was to improve the culture of feedback and feedforward. Due to the nature of the learning approach, assessment for learning, the project developed the student’s ability to critically evaluate their own, and their peer’s, work. The ability to be consciously self-critical and evaluative is a skill that is crucial for lifelong learning. Multiple feedback mechanisms were integrated into the assessment to allow student evaluation of, and improvement in, learning. The resource pack contains scaffolding activities to assist both the academic and student in the feedback and feedforward process that are adaptable to any discipline.
- Evaluation and review
The second part of this project was the evaluation of the resource packs. These project outputs were evaluated and reviewed not only from the student perspective, but also from an academic viewpoint. A cyclical approach to iterative improvements has been adopted and recommendations from the student and staff evaluation will be implemented in subsequent resource development and enhancement. Continual development and optimisation of teaching and learning resources is required to maintain relevance and also to appeal to the varying learners year on year.

Proposed Future Work

The project currently focuses on multimedia-based assessment for learning in two individual modules; however, it is self-sustaining and cost neutral as it can be rolled out across all years and practically all modules without further resource requirements. It will be particularly effective if there is a critical mass of staff engaging and it is here that the future work will be directed. The outputs of this project have been disseminated at both national (Computers in Education Society of Ireland Conference, Galway-Mayo Institute of Technology, Ireland) and international (Higher Education Academy, Science Technology Engineering and Maths Conference, University of Edinburgh, Scotland) level. Furthermore, informal and formal discussion with local academics has raised interest in the use of the resources and also this model of assessment. Collaboration will be fostered with colleagues interested in applying this model to their modules. Assistance will be provided, where necessary, to assist in the adaption of the tailorable resource pack to suit the implementation requirements of other academics/modules. This type of collaboration will allow the project to be further developed. Continuing collaboration within DIT is important to ensure the enhancement of teaching, the economical delivery of the curricula whilst maintaining a diverse, and tailorable, assessment strategy across the Institute.

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