A module on Learning Technologies for teachers in Higher Education

Un modulo sulle Tecnologie per l'Apprendimento per insegnanti dell' istruzione universitaria

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ABSTRACT This paper describes a 10 European Credit Transfer and Accumulation System (ECTS) module in Learning Technologies which forms part of a Post Graduate Diploma in Academic Practice, part of a professional development framework for academic staff. The module, which is taught through seven themed workshops over one semester, is research-informed and practice-based. Assessment is on a pass/fail basis and includes three aspects supporting reflection, technical competency and the implementation of a technology-based project. Throughout the module, technology is used as a showcase for the module content itself. The intention is to integrate the use of technology to support the pedagogy, without over-using technology for its own sake. Through surveying past participants on the module there is evidence to suggest that good practice in the use of technology is being embedded in teaching and learning activities across the university.

KEYWORDS Professional Development; Educational Technology; Learning Technologies; Open Practices; European Credit Transfer and Accumulation System (ECTS).

SOMMARIO Questo articolo descrive un modulo da 10 crediti sulle tecnologie per l'apprendimento basato sul Sistema Europeo di Trasferimento e Accumulo dei Crediti (ECTS). Il modulo fa parte di un diploma post-laurea in Pratiche Accademiche inserito all'interno di un framework per lo sviluppo professionale rivolto al personale universitario. Il modulo, che si compone di sette workshop a tema da svolgersi nell'arco di un semestre, è basato sia sulla ricerca informata che su attività pratiche. La valutazione, che si basa sul criterio "passato/bocciato", include tre aspetti a supporto della riflessione, della competenza tecnica e dell'implementazione di un progetto basato sull'uso della tecnologia. In tutto il modulo, la tecnologia viene utilizzata come vetrina per il contenuto del modulo stesso. L'intenzione è quella di integrare l'uso della tecnologia non come fine a se stessa, ma che sia di supporto alla pedagogia. Dall'indagine effettuata sulla partecipazione passata al modulo, risultano evidenze che suggeriscono che le buone pratiche d'uso della tecnologia vengano integrate nelle attività di insegnamento e apprendimento universitarie.

PAROLE CHIAVE Sviluppo professionale; Tecnologie didattiche; Tecnologie per l'apprendimento; Pratiche educative aperte; Sistema Europeo di Trasferimento e Accumulo dei Crediti (ECTS).

1. INTRODUCTION

Encouraging and supporting academic staff to make use of technology in their teaching practice is a challenge, particularly in an institution that considers itself to be research-intensive. At our institution, support for using technology in teaching is provided in multiple ways, including just-in-time support, reacting to immediate need, through to formal professional development modules as part of a post graduate framework. We have found that the formal modules are more likely to have a long term outcome, with the real possibility of culture change.

This paper gives a brief overview of the barriers to adoption of technology in teaching and learning, focusing on staff development. It then describes a framework for professional development at a particular university in the west of Ireland and focuses on a case study of the module on Learning Technologies which forms part of the Post Graduate Diploma in Academic Practice. An evaluation of the longer-term effectiveness of the module is discussed briefly at the end.

2. BARRIERS TO ADOPTION OF TECHNOLOGY IN TEACHING AND LEARNING

Many authors have written about barriers to adopting technologies for teaching and learning. Brickner (1995) proposed first- and second-order barriers to change, based on teachers' use of computers in teaching of mathematics. First-order barriers are external to the individual and may involve, for example, lack of access to training or resources. Second-order barriers are intrinsic to the individual and include the teacher's beliefs about their own current teaching practices and abilities. Ertmer (1999) points out that even when first-order barriers are removed, teachers will not automatically use technology, and second-order barriers are likely to surface.

Reid (2014) gives a review of the literature and suggests five categories for barriers: technology, process, administration, environment and faculty. He concludes that culture and norms around using technology for teaching and learning are still being formed, and that acceptance of use is still developing.

Reid's (2014) second category of barriers to adoption speaks to the focus and effectiveness of professional development opportunities. There is often a gap between educational technology training, which focuses on the technology, and how a teacher can incorporate technology into teaching and learning activities. Reid's final category, faculty, consists of second-order barriers to change and includes factors internal to an instructor such as resistance to change, beliefs about their own teaching approach or technical ability, and perceptions about the effectiveness of educational technology.

Wheeler (2012) takes Rodger's model of innovation diffusion and applies it to adoption of new technologies by teachers, identifying five adoption types. Techno-romantics tend to see technology as 'the answer'. Technophiles are those who embrace technology as a means to enhance or extend their practice. Techno-realists wait until a technology is no longer a gimmick and has shown itself to be a desirable tool. Techno-sceptics are the late majority, waiting for a solid body of evidence before adoption. Techno-luddites may be threatened by new tools and may take some form of negative action.

Finally, Ertmer (1999) suggests that, in order to achieve meaningful use of technology in teaching, teachers need opportunities to observe models of technology use, to reflect on their own evolving ideas with mentors and peers, and to collaborate on projects to integrate technology use as they try out their ideas.

3. A FRAMEWORK FOR PROFESSIONAL DEVELOPMENT

Academic practice in a research-focussed higher education institution is complex with multiple dimensions.

Academic staff, as they progress through their careers, need multiple opportunities for continued professional development, which cannot be addressed through initial induction training at the start of their career. To address this, a framework for professional development of academic practice has been developed at our institution, within which academic modules and qualifications are situated (Figure 1). Academic staff, who are engaged in teaching and supporting student learning, are invited to participate in whole programmes or to take stand-alone modules which can be accumulated over time to build a qualification.

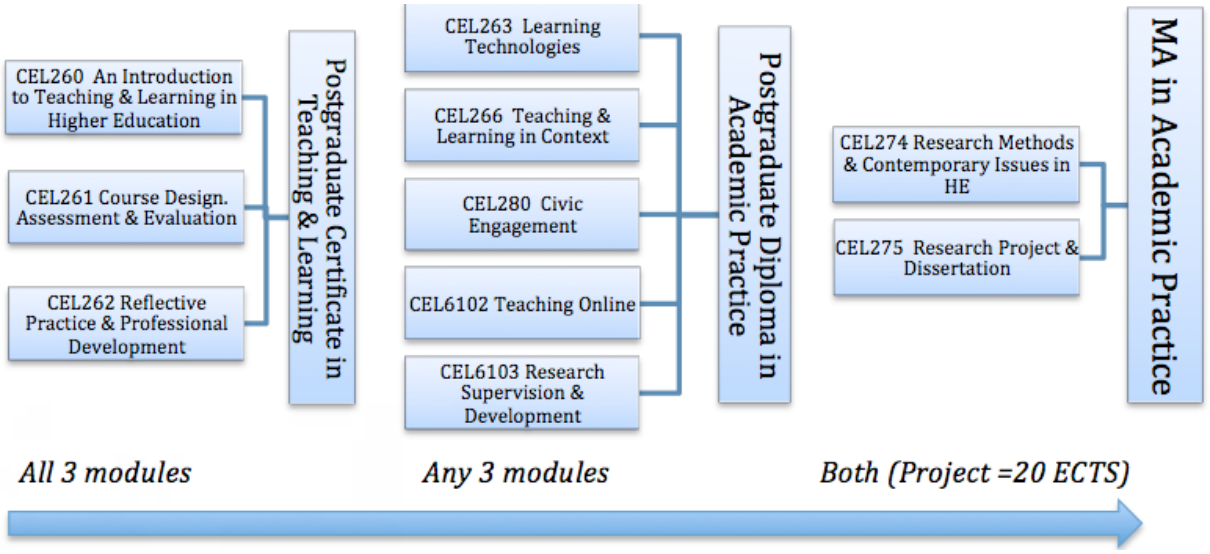

Figure 1. Framework for Professional Development[1].

The university offers a Post Graduate Certificate (PG Cert) in Teaching and Learning in Higher Education, equivalent to 30 ECTS and taken part-time over a single academic year. The programme is not currently a requirement at the university, and academic staff members apply voluntarily. The only requirement for entry is that the participant is currently teaching in higher education. Priority is given to full time members of academic staff.

Those staff who complete the PG Cert can choose to progress their scholarship by taking a Post Graduate Diploma (PG Dip) in Academic Practice, which is a further 30 ECTS programme. The PG Dip is designed to be flexible, research-informed, and practice-based. Successful completion of three optional modules (each equivalent to 10 ECTS) will result in the accredited award. The modules in the PG Dip can also be taken on a stand-alone basis by any member of staff at the university, subject to availability of places.

The final piece of the framework, for those who have completed the PG Dip, is a Master of Arts (MA) in Academic Practice. This involves an extensive practice-based project, and completion of a minor dissertation.

4. THE LEARNING TECHNOLOGIES MODULE

The module on Learning Technologies (CEL263) forms part of the PG Dip programme. It has been offered

[1] Image from http://www.nuigalway.ie/centre-excellence-learning-teaching/professionaldevelopment/celtqualification-framework/

each year for ten years, and is reviewed and revised annually to ensure that it is kept up-to-date and current. It is taught over a single semester, through seven workshops that take place every second week. Each workshop is scheduled for three hours and has a different theme. The workshops for Semester 1 in 2017 can be seen in Table 1.

Workshop	Topic
Workshop 1	Introduction & Social Networks
Workshop 2	The Learning Environment
Workshop 3	Social Media
Workshop 4	Open Practices
Workshop 5	Audio Recording and Podcast Production
Workshop 6	Video Production and Applications
Workshop 7	Mobile Learning

Table 1. Workshop topics and schedule for Semester 1, 2017.

The module is taken by up to fifteen academic staff members in any year, with roughly two thirds of the participants taking it as part of the PG Dip, and the remainder as a stand-alone professional development module. There is a single module co-ordinator and tutor, with support from a small team of learning technologists and contributions from invited guest speakers.

The module aims to provide a theoretical and practical exposure to a range of technologies used in teaching and learning in higher education, and to explore how these technologies can be used to enhance the learning experience. It is facilitated using various approaches including guest lecturers, online resources, demonstrations, practical sessions, discussion, research and reflection. In particular, students of this module are encouraged to apply their learning to teaching and learning in their own subject area. While topics included in the module are revised from year to year, two fundamental principles are used to guide its delivery. The module is research-informed and practice-based.

4.1. *Research-informed*

The module content is informed by research in the area of educational technology, such as Selwyn (2017), Laurillard (2012) and Koehler and Mishra (2009). In particular, the workshops are structured to facilitate discussion around the "how" and "why" of technology, and not just about the technology itself.

Participants are encouraged to engage with literature from general and discipline-specific articles on the use of technology for teaching and assessment in higher education[2]. This leads to frequent debates during workshops concerning the impact and effectiveness of particular approaches in the classroom.

In workshop 2, on the Learning Environment, the Digital Visitors and Residents framework (White & Le Cornu, 2012) is used to help participants examine their own personal use of digital technologies and make informed and deliberate plans to develop this.

Throughout the module, the mantra is "Learning first, technology second" and the focus is always on leading with pedagogy.

[2] An open reading list for the module is available at https://nuigalway.rl.talis.com/lists/4C7E6D8E-33F0-F3CE-9AC6-314A4103193D.html

4.2. *Practice-based*

While the module is founded in the scholarship of teaching and learning, it is also intended as a practical component of professional development, and therefore there is an emphasis on supporting participants to apply their learning to teaching and learning in their own discipline. The learning outcomes for the module are practice-based. Upon completion of this module, students will be able to competently:

- select and use appropriate technologies for learning and teaching in their subject area;
- plan and implement technology based activities for learning and teaching in their subject area;
- create (plan, develop and publish), using appropriate technologies, resources for learning and teaching in their subject area.

To support this, each workshop includes practical, hands-on activities that encourage a sense of play and discovery, while exploring how a technology can or might be used within the disciplinary context. Students of the module have an opportunity, after each workshop, to reflect on the practical activities and what influence it might have on their own teaching practice.

Guest speakers are routinely invited to give a short presentation, followed by discussion, on how they are using a technology to enhance their teaching and the learning of their students. Such guest speakers are often drawn from alumni of the module, past-participants who have subsequently carried out a technology project or intervention in their teaching. The impact of these peer-led sessions cannot be underestimated, as participants get an insight into how the readings and the theory can have a very real impression on the practice of a peer educator.

4.3. *Leading by example*

One of the challenges in delivering a staff development on learning technologies is how technology can best be used for teaching the module, as a showcase for the module content itself. The intention is to integrate the use of technology within the module itself to support the pedagogy, without over-using technology for its own sake.

From the beginning, the institution's virtual learning environment (Blackboard) is used extensively, and initial communication about the module is via the email and notification functionality, inviting students to explore the virtual course in advance of the first workshop.

Each workshop has its own area within the VLE course, with links to readings, videos and other resources (Figure 2). Each workshop presentation is recorded, using the Kaltura recording facility, and made available in the VLE within 24 hours. Assessment is conducted mostly within the VLE, and feedback is provided using Turnitin Feedback Studio. The embedded attendance tool, Qwickly, is used at each workshop and participants can track their own attendance records.

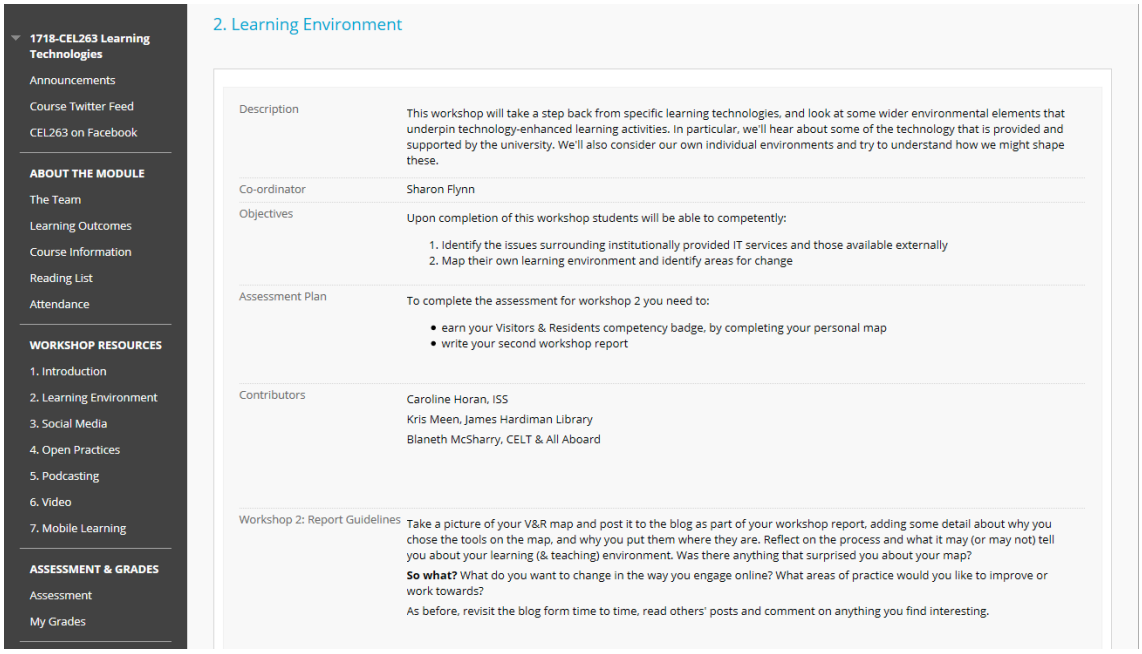

Figure 2. Extract from Blackboard course with information for workshop 2: Learning Environment.

The module content includes aspects of being an *Open Practioner* (Cronin, 2017). For this reason, several open tools are included and discussed in the teaching of the module. In workshop 1, students are introduced to Twitter and a course hashtag (#cel263) is used throughout the semester to communicate and share resources. A weekly journal is automatically created, based on the Twitter contributions of the current and past participants on the module[3]. By request from participants, a closed Facebook group was created, but this is much less used and does not encourage a democratic participation in the same way that Twitter does. In the workshop on Social Media, a Wikipedia familiarisation session is included, and participants are supported to create a Wikipedia account and upload a photograph of the building where they work to Wikimedia Commons[4].

Where possible, resources and materials published under a Creative Commons licence are provided for students. These include the lessons developed as part of the All Aboard – Digital Skills in Higher Education project[5], which are used throughout the module as appropriate, as well as BYOD4L (Bring Your Own Devices for Learning), an open learning event for students and teachers[6], which is used as part of the Mobile Learning workshop.

5. ASSESSMENT OF THE MODULE

The CEL263 Learning Technologies module is a 10 ECTS module and is assessed on a Pass/Fail basis. To pass the module, students must satisfactorily complete workshop reports, a final project report and

[3]The current #cel263 weekly journal is available at https://paper.li/sharonlflynn/cel263#/

[4]A description of the Wikipedia activity can be found at https://learntechgalway.blogspot.ie/2015/11/nui-galway-on-wikimedia-commons.html

[5]All Aboard, http://www.allaboardhe.ie/, was funded by the National Forum for the Enhancement of Teaching and Learning in Higher Education.

[6]BYOD4L, https://byod4learning.wordpress.com/

presentation, and demonstrate a number of key competencies. There are three aspects to the assessment: supporting reflection, technical competency and the implementation of a technology-based project within their own practice.

5.1. *Reflection*

Throughout the module, participants are expected to reflect on the content of each workshop, the associated readings and any practical activity in the context of their own practice. A shared course blog is set up within the Blackboard course, to which all students can post, read and comment on each other's reflections. Following each workshop, the module leader posts a prompt, a guided question or task. Participants then respond to the prompt with a workshop report, referring to literature as appropriate. They are encouraged to re-visit the blog from time to time, before the next workshop, to read and react to others' posts.
An example prompt, for the Mobile Learning workshop, is:

- Tell the group about your favourite app for teaching/learning and how you use or might use it in the future.
- Consider the 5C's of the BYOD4L open course, and tell us how your chosen app might support one of these.
- Identify and explain where your use/proposed use is in the SAMR[7] framework.

A sample response, to the prompt on using Podcasting in teaching, can be seen in Figure 3. Names of the participants have been obscured to protect their identity. Notice the volume of posts throughout the duration of the module.

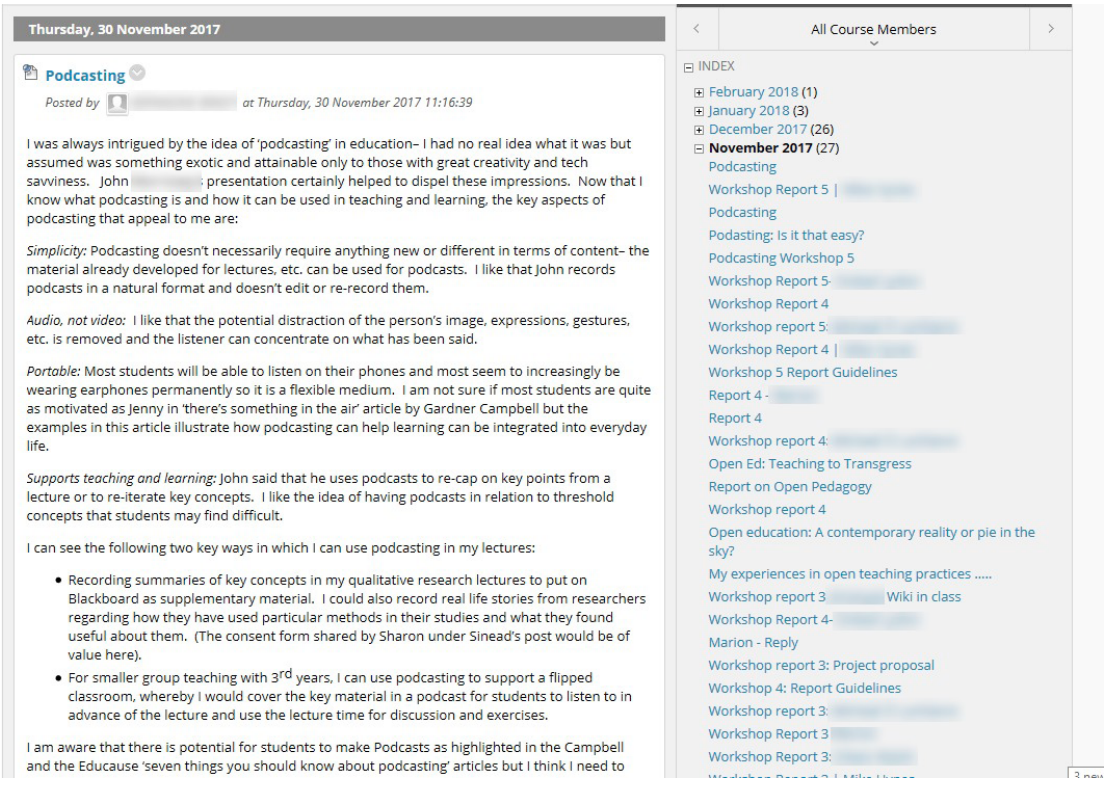

Figure 3. Extract from the Workshop Reports blog on Blackboard.

[7]The Substitution Augmentation Modification Redefinition model (Hamilton, 2016).

The workshop reports serve a number of purposes. First, they encourage reflection on the topic of the week, beyond what is covered and discussed during the 3-hour workshop. Second, they support the development of a sense of community. By sharing the reflections with each other, participants begin to have a better understanding of the contexts that others work within. They provide support for each other, give constructive feedback and advice, and challenge each other to examine their own preconceptions about using technology in teaching. In addition, the workshop reports provide invaluable insight for the course leader to understand the needs and interests of the individual participants, which can be follow up during the workshops or by individual correspondence.

5.2. *Competencies*

In a module on learning technologies, it is important that each participant is given the opportunity for hands-on practice with the technologies under discussion. In some cases, a participant may already be familiar or have significant experience in using the technology, and in that case, he/she can give invaluable peer support. Often, however, the participant has little or no experience, and will be pushed outside their comfort zone.

Students are required to demonstrate seven key competencies, one for each workshop, and awarded a digital badge for each one. Some additional badges may be awarded (Figure 4). Normally, the badge will be earned for completing a hands-on task within the workshop. In some cases, there may be some additional activity required after the end of the 3-hour session.

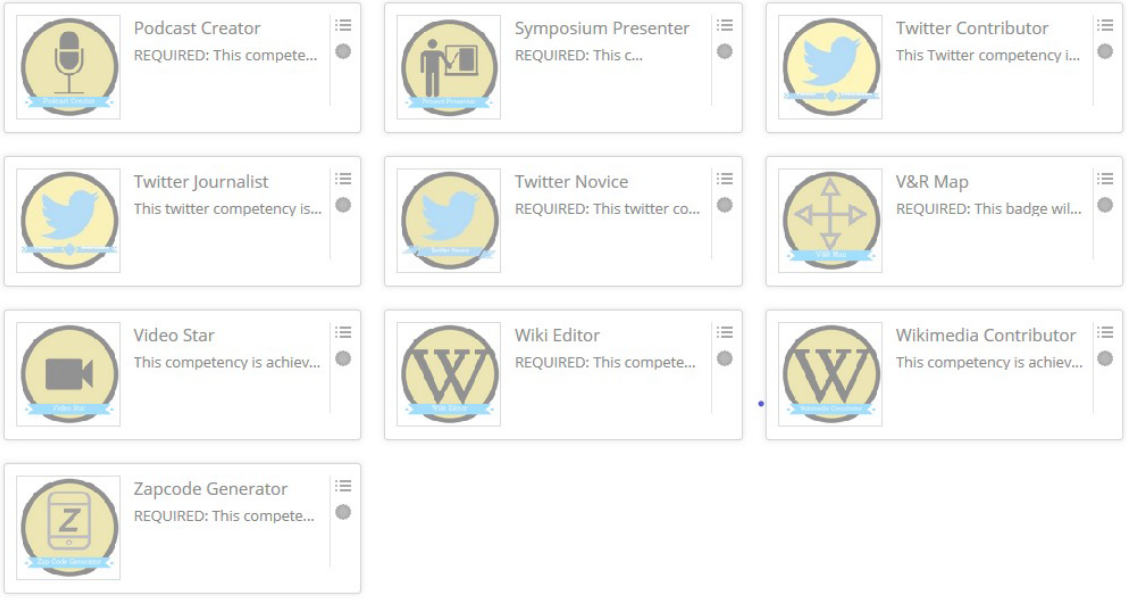

Figure 4. Digital badges, using Blackboard's Achievements tool, awarded for demonstrating key competencies in the module.

Some examples of badges awarded are:

- Twitter Novice, awarded when the participant has created a Twitter profile, followed 10 people of interest, and contributed to the #cel263 Twitter discussion.
- Wiki Editor, awarded when the participant has successfully contributed to a class wiki on

Blackboard (with minimum criteria).

- Podcast Producer, awarded when the participant has recorded and edited a short audio podcast, and has shared it in the Blackboard course.

In particular, the gamification element of collecting digital badges has had a significant effect on the participants' willingness to engage with the practical activities.

5.3. *Implementation in context*

The final assessment component is the individual project. Each student is asked to identify and complete a project, based on the material covered in the module, to incorporate Learning Technologies in their own teaching. Free scope is given in identifying a technology or technologies based on an identified pedagogical goal.

The participant could choose to use technology to develop teaching/learning resources; to incorporate the use of technology as part of a course/module; or to evaluate current use of a technology in teaching. The intention is that this will result in a meaningful and directly applicable piece of work.

The module uses a structured approach to the project component. During workshop 3 the project is introduced and students are invited to submit a short 1-page proposal within 3 weeks. Feedback is given on the proposal, relating to the scope of the project, the technologies used, suggestions of appropriate readings and evaluation techniques. The student then has an extended period of time to implement the project, with the support of the institution's Learning Technologies team. A project symposium is held early in the second semester, when students present their findings and can get constructive feedback from their peers and the team, and a short project report is submitted. Following advice from an external examiner, each report must include at least five references to relevant research/journal articles, conference papers or other academic work.

The aim for this project is to move each participant beyond their comfort zone and to try something new in a supported environment.

6. EVALUATION

The module is reviewed annually to take into account advances and changes in technology culture. For example, in 2013 and 2014, one whole workshop was devoted to Massive Open Online Courses (MOOCs) but this has been replaced with a more pragmatic consideration of Open Practices in education and what it means to be an open practitioner (Cronin, 2017).

Student feedback is extremely important and feedback is sought annually through the class representatives' scheme. For the most part, feedback is positive and participants find the module useful in their own practice. Due to the insights available throughout the module as part of the workshop reports, there is rarely anything surprising in the module feedback.

6.1. *Assessing the impact*

In 2015 an assessment was made of the impact of the Learning Technologies module on the use of technology in teaching and learning in the institution, based on an earlier survey of graduates of the module (Flynn, 2015). The respondents were mostly technorealists, using Wheeler's (2012) classification by techno-culture. A small number of respondents were technophobes, those who rarely adopt a new technology, or technophiles. There are also some techno-sceptics, those who do not lack confidence but who question the use of technology at all.

The findings were that most of the respondents continued to use technology in their teaching, and there was

indication of a maturity in use, the ability and confidence to recognise when something is not working, but not to be discouraged. A significant number of the participants had become technology champions within their discipline or school, indicating that discussions around technology use are actually happening within the disciplines.

Around half of the respondents indicated that they had presented their work with technology in education, as a seminar or at a conference. A small number had applied for funding for their work, through national calls for teaching enhancements.

When asked how the module had helped with the integration of technologies into teaching practice, there was a range of responses. From a technorealist:

«*To be honest, I don't think I would have experimented with the various learning technologies if I hadn't first been shown them. I feel much more informed now about what is available, and do think that the integration of learning technologies has had a positive impact both on the teaching and hopefully on the learning experience for students*».

For one of the technophobes, the module transformed practice:

«*The module helped me decide on what would be appropriate to the learning needs of the student cohort I look after. In relation to presenting at a conference about learning technology, it is not something I would have ever considered myself doing because to be honest I was a technophobe. Doing the module really helped me get over this. I am not so scared of technology now*».

While the techno-sceptics are a challenge in the classroom, they also help to ground the group. One techno-sceptic commented:

«*The module allowed a discussion of where trends were going and there was some space for grumpy types to make observations about why should bother using the various tech and how and to what purpose. However, we were then cast into the pit of actually having to do something…and that was fun and more or less got one to understand the basics of 'how to'*».

Our conclusion was that the module, with its mix of research-informed and practice-based workshops and assessment, supports different types in different ways. While respecting the techno-background of each individual, the supportive and community approach encourages each participant to try something new and progress teaching practice.

7. CONCLUSION

The module on Learning Technologies as described in the case study has been developed and offered at the university for ten years and there is some evidence to suggest that it is having a longer term impact on teaching practice. It addresses both first- and second-order barriers to the adoption of educational technologies.

First-order barriers are addressed by focusing on pedagogy, while still ensuring a practical, hands-on dimension for participants. At the same time, second-order barriers are being overcome, as evidenced by the feedback and development of the various techno-cultures participating in the module.

The strategies for achieving meaningful integration of technology in teaching (Ertmer, 1999) are met through leading by example, providing opportunities for reflection and discussion with peers and mentors, and through the implementation of a significant project to incorporate learning technology in context.

Future research should include an attempt to further track the activities of graduates of the module at intervals, to map their development in the use of technologies to support teaching, to give a longer-term evaluation of impact. It would also be of interest to replicate the module in other institutions and compare outcomes.

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