Emergent Versus Planned Assessment and Tuition Strategies for Online Postgraduate Teaching of Technology and Innovation Management at the Open University, UK

Alison Bettley and Ivan Horrocks

Abstract This chapter examines the development of the assessment and tuition strategy (ATS) for the online postgraduate teaching of technology and innovation management (TIM) at the Open University, UK. Both curriculum content and the ATS have changed significantly in the 25 years since the introduction of this taught programme. Drivers of change have been many and various including factors both internal and external to the institution. Some ATS changes have been prescribed or specifically designed, for example, to address new institutional policy, but others have evolved more gradually, through learning from experience and exploration. The chapter outlines the curriculum, identifies the significant changes made to the ATS together with their rationale, and evaluates the effectiveness of both the current ATS, as a whole, and the approach to its development. Evaluation draws on a variety of internal review activities as well as the benchmarks of good practice in the literature. The chapter concludes that the ATS has considerable strengths and that the combination of prescriptive and emergent approaches to development of the ATS, enabled by online learning tools, serves the programme well.

Keywords Technology management • Innovation management • Assessment strategy • Tuition strategy • Postgraduate distance learning

1 Introduction

Postgraduate Technology and Innovation Management (PG TIM) curriculum is part of a long tradition of the provision of taught postgraduate qualifications (PG certificate, PG diploma, MSc) by distance learning across a range of disciplines in the Faculty of Science, Technology, Engineering, and Computing (STEM) at the UK's Open University (OU). Over the past decade and a half, STEM postgraduate programmes have led the transition of the delivery of OU courses from print-based

A. Bettley (✉) • I. Horrocks
School of Engineering and Innovation, The Open University, Milton Keynes, UK
e-mail: alison.bettley@open.ac.uk

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module materials supported by face-to-face tutorials and end of module assessment (EMA) delivered locally to a blended learning approach combining online module delivery with text-based teaching units and multimedia materials supported by online synchronous and asynchronous group and individual tuition. This chapter discusses the development of the assessment and tuition strategy for technology and innovation management (TIM) qualifications over more than two decades. The chapter's content follows the sequence:

- Outline of the institutional and curriculum context
- Digest of significant changes to the ATS, their rationale, and judgement of whether the change is predominantly prescriptive or emergent.
- Review of the ATS objectives
- Evaluative discussion of the ATS effectiveness
- Concluding remarks

2 PG TIM at the OU

The OU delivers a wide range of undergraduate (UG) and postgraduate (PG) curriculum through its supported modular distance learning model. Students are provided online with multimedia learning materials and receive support from a personal tutor who marks assignments and provides both individual and group tuition. Students can adopt a modular study intensity to fit with their work and personal circumstances; although modules run over a fixed period of time with fixed assessment deadlines, students can otherwise flex their study activity around their nonacademic commitments. Each module is produced by a core team of academics and support staff, responsible for module content and learning and assessment design. Tuition is provided by a team of associate lecturers (ALs) working under the guidance of the core module team and line managed by a staff tutor, who is responsible for AL recruitment, appraisal, and staff development. Tutor marking is monitored by an academic member of the module team to ensure consistency and provision of effective feedback. Student Support Teams of advisers provide administration services as well as being a point of contact for students requiring nonacademic or study support advice.

PG TIM curriculum was introduced in 1992, as the European Management of Technology Programme, delivering a specialist MBA in Technology Management. Curriculum development was part-funded under a European Commission initiative designed to address what the Commission believed to be significant shortcomings in technology management skills and expertise in EU countries when compared with elsewhere, in particular Japan and the USA (Industrial Research and Advisory Committee of the Commission of the European Communities (IRDAC), 1991). PG TIM curriculum also formed part of the University's Manufacturing Management and Technology programme (now discontinued). The curriculum has since developed continuously to ensure its relevance to an increasingly service-based econ-

omy; most recently core modules have been rewritten to give more emphasis to innovation management. Since 2004 an MSc, PG certificate, and PG diploma in Technology Management have been offered in addition to the MBA (see Figs. 1 and 2).

The range of electives, drawn from other PG curriculum in STEM and business faculties, provides the means for students to tailor qualifications to their interests. TIM modules (T847, T848, T849, T883, T889) are also options within other PG STEM qualifications (such as Engineering, Environmental Management, and Systems Thinking in Practice). Most modules are 30 credits (300 h of study) of 6-month duration and run twice a year so that students can gain a master's qualification in 3 years.

The student body is large and extremely diverse, drawn from the UK and Europe, and occasionally further afield. Taught modules attract up to approximately 300 students per annum. Students are typically mature professionals employed in a wide range of economic sectors, public and private, and small and large organisations, in technical and general management roles. They may be returning to study after a considerable gap and are often seeking to build on their practical experience rather than prior academic study. Students may therefore embark on their TIM studies without any previous experience of the discipline and in some instances without a UG degree. Study aims are almost always career development, through either PG qualifications or single modules.

The ATS has developed with the curriculum, as outlined in the next section.

3 Evolution of the Assessment and Tuition Strategy (ATS)

The TIM ATS has changed considerably since the curriculum's inception. Some changes have been prescriptively designed to align with new institutional assessment and tuition policies or to address developments in pedagogical technologies. Others have emerged through a more evolutionary and incremental path, from learning from trials of different approaches and from student or tutor experience. Patterns of successful practice have become established strategy, and learning from the experience in one area of the curriculum has informed further development of the wider ATS.

Table 1 lists the most significant changes made to the TIM ATS since the inception of the programme. Each is identified as 'prescriptive' or 'emergent' according to which approach was dominant. This 'classification' is based on well-established concepts from the literature on strategic management and strategy development. Prescriptive strategies are top-down and deliberate, based on explicit analysis of internal and external factors. Emergent strategies are by contrast more bottom-up, evolving as a result of multiple changes in response to environmental factors or based on learning from stakeholder feedback and experience (Mintzberg, Ahlstrand, & Lampel, 2008; Neugebauer, Figge, & Hahn, 2016; Rumelt, 2011). It is generally recognised that the more complex the context, the more weight should be given to

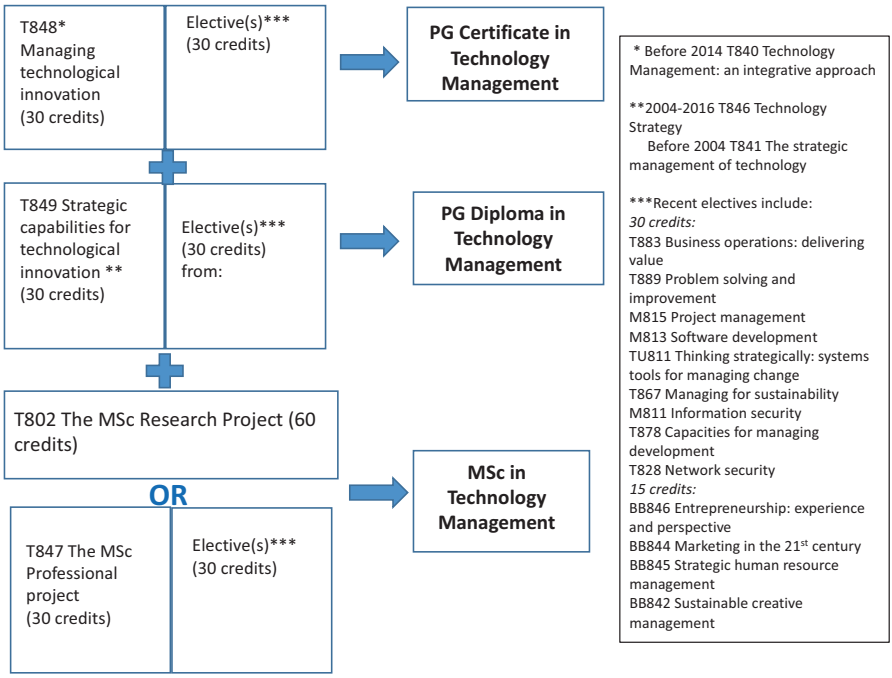

Fig. 1 Structure of MSc Technology Management and nested qualifications

emergence (Neugebauer et al., 2016; Paarlberg & Bielefeld, 2009). 'P/E' indicates significant contribution from both approaches, with typically emergence occurring at the module level and prescription at programme or institutional level.

The mix of prescription and emergence evident in Table 1 can be considered appropriate for the TIM curriculum environment, a combination of relatively stable aspects, such as external quality assurance benchmarks, with many more complex and dynamic aspects. Examples of the latter include the diversity of the student body with respect to education background, workplace contexts, geographical location, and study objectives and pathways, variation of these factors from one module presentation to another, diversity of tutor backgrounds, the personalised nature of tutor-student interaction, and the multiple purposes of assessment and tuition (Price, Carroll, O'Donovan, & Rust, 2011). The next section reviews the TIM ATS objectives.

3.1 Objectives of the ATS

Assessment in higher education typically serves a multitude of purposes (Quality Assurance Agency for Higher Education, 2006; Rust, 2002; Scottish Qualifications Authority, 2009; Yorke, 1998). For PG TIM the following can be identified:

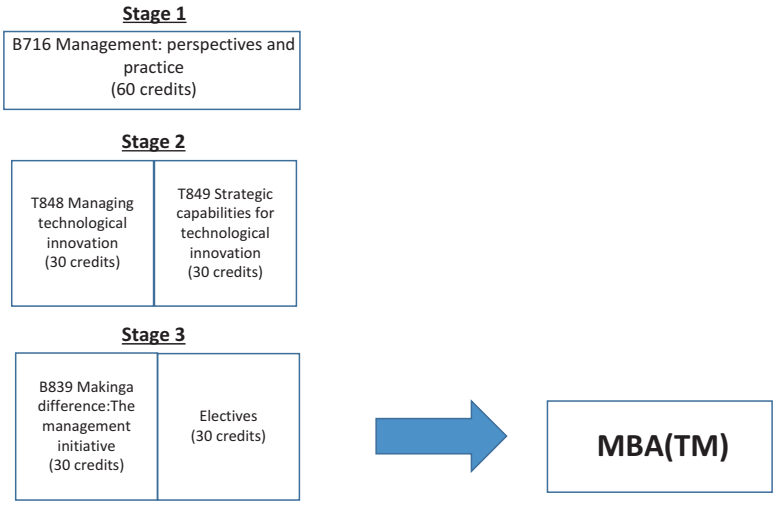

Fig. 2 Structure of MBA (TM) qualification

1. Summative assessment (assessment *of* learning) for the award of credit/qualifications, in relation to the module and qualification learning outcomes with respect to skills and knowledge
2. Formative assessment (assessment *for* learning) – a long-established main objective of assessment in the OU context and an essential element of overall learning design, embracing:

    - Learning from feedback
    - Learning 'by doing', using authentic tasks
    - Identification of strengths and weaknesses
    - Feedforward – advice and guidance to support students in their future learning and assignment work
    - Motivation to study through student engagement with authentic tasks
    - Pacing of study
    - A means by which tutors can identify where students might need help
    - Lifelong learning – learning that will benefit the student beyond the aims of modules and qualifications
    - Benefits to employers through practice-related assessment tasks and demonstrable individual professional development

3. Provision of evidence that the programme is successful and that module content and its teaching are effective (e.g. for quality assurance and enhancement with respect to internal and external standards)
4. A contribution to institutional research outputs through capstone project modules

Table 1 Significant changes to the TIM ATS

Change	Rationale/driver	Prescriptive/emergent (P/E)
Reduced number of TMAs from 4 to 3 (from 2004)	To avoid 'over-assessment' but maintain appropriate pacing of study and to achieve consistency across programmes	P/E
Removal of compulsory residential school (from 2004)	The MBA(TM) qualification was transferred to the OU Business School with integration into the general MBA programme (to comply with accrediting body requirements)	P
Replacement of unseen examination by project-style assignment (in core modules from 2014)	Students increasingly were not achieving their full potential in the examination as evidenced by better student performance in a module (T889) using a more integrative assessment strategy without an examination. Project-type assessment is more 'authentic', more engaging for students, and a better vehicle for testing 'application of learning' outcomes. It also facilitates linkage between assignments and development of academic literacy skills	P/E
More practice-related assessment tasks (in electives T883/T889 from 2005/2007, in core modules from 2014)	This allows students to customise learning to their context and provides more authentic, motivating, and engaging assessment tasks. This aligns with other changes (see later) to emphasise real-world relevance of learning and replaces some of the 'application of learning' activities characteristic of now defunct residential schools	E
Tutors teach on several modules and have larger tutor groups	Changes to institutionally determined contractual arrangements have resulted in tutors with a broader understanding of the curriculum but less flexibility because of insufficient capacity to take on additional duties	P/E
Reduced weighting of the first assignment to 20% in core taught modules from 2014	The three tutor-marked assignments (TMAs) are weighted 20/40/40%. The low-stakes first assignment recognises that some students have little prior experience of PG study and/or the TIM discipline	P
Introduction of 'professional' route to MSc, from 2012	This change aims to increase the number of students progressing to MSc and provides more authentic project work that aligns better with student study objectives than the alternative 60 credit research project	P/E

(continued)

Table 1 (continued)

Change	Rationale/driver	Prescriptive/emergent (P/E)
More progressive academic literacy skills development	A variety of steps have been taken over several years (from 2005) aiming to improve student performance and attainment especially in capstone project modules (see 1.5.2.2)	P/E
Larger proportion of study time allocated to assessment tasks (2007-)	High student attainment in one module (T889) with this characteristic led to the guiding principle for taught module design that at least one third of total study hours should be allocated to assessment-related activities	E
Closer alignment of tuition and assessment strategies	The strategy of more gradual development of academic literacy skills gives greater emphasis to feedback related to 'feedforward' skills development	P/E
Mix of 'cluster' and tutor-group online tutorials	The mix of tutorials open to all students and tutor-group-only events is aimed at efficient use of tuition hours, a richer tutorial experience for students, avoidance of duplication, and learning event choices for students	E
Single online discussion forum for each module with multiple threads including topical themes	Larger forums provide the critical mass necessary for effective peer-to-peer and tutor interaction. Discussion of topical themes has emerged as an effective enrichment of module content	E
Entirely online tuition with a predetermined schedule of online learning events from 2016	All online tuition is a faculty policy for PG, driven by falling attendance at face-to-face learning events, cost reduction, and expectation that online events suit better our geographically diverse and time-poor students	P
Introduction of wikis for collaborative working from 2012	New pedagogical tools provide additional opportunities for collaborative working, intrinsically difficult in distance learning. Experience in module T847 will be evaluated to inform future extension to other modules	P

(continued)

Table 1 (continued)

Change	Rationale/driver	Prescriptive/emergent (P/E)
Reduced proportion of study time as directed learning	Modules are now designed to allow students more time to pursue their own areas of interest within the subject, evidence of which is rewarded in assessment. This aims to enhance student motivation, study authenticity, and the development of lifelong learning skills. Module materials signpost optional supplementary and support material through activities labelled 'extend your learning', with links to a wide variety of online resources such as YouTube videos and other real examples of technological innovation, debates, expert views, additional academic publications, and so on	P/E

A single piece of assessment may address more than one objective, for example, OU TMAs are both summative and extensively formative.

Tuition objectives are closely related to assessment objectives and can be summarised as follows:

1. Determination of marks for summative assessment
2. Provision of formal formative feedback on assessment tasks to:
   - Develop subject knowledge and skills and academic literacy skills
   - Build student confidence and motivation to enhance student satisfaction and retention/progression
   - Explain course material as required
3. Monitoring student progress with follow-up of particular issues such as non-submission of assignments
4. Delivering online tutorials to develop subject and academic literacy knowledge and skills and to prepare students for assignment tasks
5. Facilitation of student learning more generally through the media of online forums, tutorials, and individual email contact

The next section evaluates how well the current ATS meets these objectives.

3.2 Evaluation of the ATS

This evaluation considers external 'benchmarks' of good practice from relevant literature and draws on a variety of internal curriculum and assessment review activities: an institution-wide assessment project (Evans, Jordan, & Wolfenden, 2016;

The Open University, 2014b), a faculty wide assessment review project (Bettley, Walshe, & Lucas-Smith, 2010; Kantirou & Fisher, 2010), a programme workshop 'assessment for learning' evaluation, periodic programme reviews, and periodic and annual module reviews.

3.2.1 Summative Assessment

Modules other than capstone projects follow the same overall assessment structure: three TMAs, weighted 20/40/40%, making up the continuous assessment element, plus the 'extended' mini-project EMA. Continuous assessment and the EMA are equally weighted to determine the overall module score, and a pass grade must be achieved on both. Introduction of the new assessment strategy without an examination has improved both student attainment and student satisfaction, for example, in one module, a first attempt pass rate of approximately 50% has increased to above 80%.

Originally taught modules had four TMAs, but concerns about 'over-assessment' led to the reduction to three. It has been said that the real issue is not over-assessment as such, but the balance between summative and formative assessment (Price, Carroll, O'Donovan, & Rust, 2011). This is difficult to evaluate because in the OU model, summative and formative assessment are generally combined. Pacing of study is a significant function of the assessment structure, so retaining at least three TMAs is considered important. The lower stakes first assignment is designed to encourage submission and promote retention and allows time for students to adapt to a different level or subject of study. Modules achieve high retention rates – typically 85% of those starting successfully complete taught modules.

Relatively few (compared with other institutions) distinction grades are awarded for the MSc. This is a consequence of the relatively high hurdle of requiring a distinction grade in the capstone project modules. Although it is too early for definitive conclusions about grades, student performance in capstone modules shows improvement since the increased emphasis on academic literacy in earlier modules.

Monitoring of tutor marking indicates consistency of marking, and student appeals of marks are rare.

3.2.2 Formative Assessment

The focus on assessment for learning in our current ATS is consistent with the first of the OU's seven principles of assessment: 'The primary purpose of module assessment should be support of student learning and the development of self-regulated reflexive independent learners' (The Open University, 2014b). This aligns closely with recent pedagogical literature advocating much greater integration of assessment with overall learning design (Boud & Soler, 2016; Pereira, Flores, & Niklasson, 2016; Price, Carroll, O'Donovan, & Rust, 2011) and with placing emphasis on preparing students for life beyond formal study (Boud & Falchikov, 2006; Harlen,

2005; Maxwell, 2012; McDowell, Wakelin, Montgomery, & King, 2011). One instantiation of this thinking is Northumbria University's model of 'assessment for learning' consisting of six key elements (Bohemia, Harman, & McDowell, 2009): authenticity and complexity, sparing use of high stakes summative assessment, extensive opportunities for confidence-building activities before summative assessment, rich in formal feedback, rich in informal feedback, and develops students as independent learners who can direct and evaluate their own learning.

Relevance and Application of Learning

Authentic assessments 'are based on tasks that require students to demonstrate practices, behaviours, and skills that are required of professional practitioners' (James & Casidy, 2016, p. 3). TIM assessment meets several authenticity criteria (Ashford-Rowe, Herrington, & Brown, 2014) especially with respect to its challenge, the application of the taught skills and knowledge to the workplace, and the encouragement of critical reflection.

Progress towards more authentic assessment has been made through replacement of the traditional 3-h unseen examination with a practice-related mini-project EMA (from ca 2011); TMA tasks that prepare for the EMA, requiring students to apply theoretical models, concepts, and techniques to self-chosen real-life organisational situations, typically related to their employed role; and the introduction of the professional route to the MSc using a 30-credit consultancy style project. Students are advised in the T848 and T849 assessment guide: '… you will be asked at several points in the module – within module activities, as well as the TMAs and EMA – to apply what you have learnt to an organisation of your choice. This is a great opportunity to add value to your employer organisation, to your own professional role or to any other relationship you have with a public, private or voluntary organisation' (Horrocks, 2016, p. 12).

Authenticity is not only academically advantageous in facilitating the learning of theoretical concepts, but it also engages and motivates students and is likely to have a positive impact on retention and progression (James & Casidy, 2016) as the following TIM student comments testify:

> The overlap of the assignment[s] with a real work situation has been a strong motivation to engage with the assignment[s]. [T883, 2005]

> TMA02 was especially useful … it has helped me plan for the future growth of the company. [T883, 2013]

> This module left us to our own devices, and encouraged us to draw on our broader and deeper knowledge and abilities. It was a worthy "capstone" module. [T847, 2013]

> The module materials definitely increased my knowledge of the topic and are very relevant to my work. I will be able to apply a lot of the new knowledge now. [T848, 2015]

Employers also benefit from authentic 'problem-solving' tasks, both directly and indirectly from the professional development of their employees. The 'slow convergence' of academic learning and professional development is cited as a particularly beneficial characteristic of online distance postgraduate study compared with fast-track master's courses because it enhances the student's capability to apply their learning to the workplace (Brooks & Roberts, 2016) and allows for application of learning to be treated as 'a skill in its own right' (Brooks & Roberts, 2016, p. 1704). The significant proportion of students sponsored by employers (currently approximately 30% down from more than 70% before the 2007–2008 economic crash) bears witness to the perceived value. Inevitably the degree of authenticity that can be achieved is limited, compared with study aims that are specific to a profession such as teaching or nursing (Chan & Gurnam, 2010), by the diversity of TIM students' professional roles. Nevertheless, exploration of further opportunities through consultation with students and other key stakeholders such as employers would be worthwhile.

Integrated Skills Development and Lifelong Learning

The curriculum integrates the development of academic literacy skills from the first module of study through to the capstone project module as follows:

- The first TMA of both our compulsory taught modules focuses on information literacy skills to underpin development of good academic practice throughout the rest of the module and beyond.
- Development in conjunction with the library of a programme-specific comprehensive information literacy skills website to support students throughout their PG studies, signposted from module materials and by tutors in assignment feedback as appropriate.
- Each of the second and third TMAs contains a secondary question designed to help students prepare for the EMA and to provide opportunity for tutor feedback on this preparatory work.
- The EMA is designed to encourage student reflection on their earlier assignment work and its integration into a coherent whole.
- EMAs in taught modules act as preparation for capstone projects.
- ATS is consistent across all TIM modules, to maximise the learning that can be carried forward.
- The module materials include activities designated as preparation for assignment tasks.
- The TMAs in the capstone project dissertation serve as drafts of the final submission.

In the early years of the programme, most of the teaching and assessment of research and related academic skills had taken place within capstone modules. The current more integrated approach achieves the aim of improving both the numbers

of students progressing through to master's degrees and student performance in project modules.

Focus on the authenticity of assessment and skills development enables students to become genuinely independent learners capable of pursuing interests, professional or personal, independently of formal academic study (Hallett, 2013; Lea, 2004; Saltmarsh & Saltmarsh, 2008). The term 'sustainable assessment' has been coined (Boud, 2000; Boud & Falchikov, 2006) to indicate assessment tasks that, for example (Boud & Soler, 2016), help learners address the challenges they face in practice/professional settings, produce benefits to the learner that persist beyond fulfilment of the current study aims, and enable the learner to appreciate, articulate, and apply the criteria for good work in the field. The student comments above demonstrate significant alignment with these criteria.

Working collaboratively is an important aspect of authentic assessment and is seen as a weakness of traditional distance education, but new (Web 2.0) technologies provide the means to reverse this. User experience of these new tools is variable for many reasons, some associated with unfamiliar technology and others with the more generic concerns such as unfair division of labour and perceptions of reduced study flexibility (den Exter, Rowe, Boyd, & Lloyd, 2012; O'Neill, Scott, & Conboy, 2011; Pilkington & Sanders, 2014). As noted previously, wiki use is currently being actively explored for TIM curriculum.

Feedback

High quality and timely feedback is crucial for any learning design (Shute, 2008) and is an essential and established element of the OU distance learning model. Tutors are required to comment on student work in detail and to produce separate summary comments highlighting strengths and weaknesses. Monitors appraise their feedback against criteria such as clarity, tone, accuracy in correcting errors or omissions, and relevance to future assignments (feedforward), consistent with established good practice (Li & De Luca, 2014; O'Donovan, Rust, & Price, 2016; Rae & Cochrane, 2008; Shute, 2008; Walker, 2009). Electronic submission, marking, and returning of assignments that facilitate timely feedback – within 10 days – are the university target. There is still nevertheless a tendency for tutors to focus on feedback on the assessment task and for students to see each assignment, and module, in isolation. It is known that modular structures generally tend to limit the extent of feedforward between modules (Jessop, El Hakim, & Gibbs, 2014; Rust, 2000). The various linkages between TIM assignments and modules (see above) help counteract these tendencies.

In spite of much evidence of good practice, a significant unknown is how well students engage with feedback and act upon it. This is an issue across the sector (Li & De Luca, 2014; Price, Handley, & Millar, 2011; Rae & Cochrane, 2008; Walker, 2009). The characteristics of effective feedback may be known, but 'best practice' in ensuring student engagement with it has not yet been established. Research sug-

gests the need for greater 'assessment literacy' among both students and tutors, underpinned by appropriate institutional policies and processes (O'Donovan et al., 2016; Price, Carroll, O'Donovan, & Rust, 2011; Walker, 2009).

It is tempting to suggest that use of social media by students can replace serendipitous face-to-face informal feedback typical of the conventional institution. However, in practice, it is necessary to design into the distance learning experience a range of informal feedback opportunities. The principal informal peer-to-peer and student-tutor interactions take place in online tutorial and forum activities and via individual tutor-student telephone and email communications. Also, a long-established practice is the inclusion throughout module learning materials of 'self-assessment questions' (SAQs) designed to build students' confidence in their understanding of course concepts.

3.2.3 Quality Assurance and Enhancement

Assessment and tuition issues are explicitly addressed in the university's teaching quality management regime which includes periodic and annual review of modules and qualifications. Trends in student performance and satisfaction are routinely explored. 'Real-time' measures of assessment and tuition are available via the tutor monitoring process and the module team's oversight and participation in student and tutor online forums. These inputs inform immediate, short- and long-term changes to module materials, assessment tasks, and so on, enabling continuous enhancement.

3.2.4 Research Outputs

Two research-related outputs are relevant. First, developing student research capabilities is an important master's learning outcome and supportive of lifelong learning objectives. Second, dissertations produced for capstone projects are themselves actual or potential research outputs. Some are retained as library resources. There are instances of students' capstone project work being developed into journal papers (see, e.g. Crotty & Horrocks (2017)) although this is unusual. Barriers include the considerable additional work for both staff and student, student perception of employer confidentiality issues, and the small proportion of students seeking academic achievement beyond their qualification.

3.2.5 Tuition

The OU tutor role is significantly different from most other HEIs because of its particular distance teaching model. Simpson (2012) defines the tutor role as comprising a 'spectrum of activities':

- Defining the course territory
- Explaining the course
- Assessment and feedback – formal and informal, formative and summative
- Developing skills and motivation
- Chasing student progress and record-keeping
- Exploring and enriching the course

TIM tutors spend the majority of their efforts on marking and providing feedback on assessment, including feedforward, and on preparing and supporting students to tackle assignments. They also run online tutorials, answer student queries both individually (by email or telephone) and in online forums and moderate forums, and follow up students who fail to submit assignments. There is comparatively little need for tutors to explain, explore, or enrich the course because of the extent to which this is built into module materials through, for example, extensive use of examples and cases. Nevertheless, tutors do contribute to these objectives through online tutorials and forum discussion. Library staff also contribute to tuition, especially associated with academic skills development, providing not just generic and module-related resources but also helpdesk and related enquirer services.

The monitoring process, carried out by an academic member of the module team, confirms that marking is consistent across tutor groups and that formal feedback communicates effectively to students the strengths and weaknesses of the work submitted. It is rare for tutors to be deemed lenient or severe in their marking. Monitors' feedback to tutors is typically associated with reinforcing strengths in constructive criticism, encouraging more feedforward, and ensuring the key feedback messages are not buried in a wealth of detail. Specific staff development is offered to tutors as appropriate.

The individual tutor-student dialogue in the OU context is very much focused around feedback on assessment, not least because student participation in tutorials and online forums is optional and therefore not a guaranteed vehicle for dialogue. Tutors are appointed on the basis of both their academic and practitioner experience because this dual capability enables assessment feedback to be relevant to the student's application of their learning. Mature part-time and perhaps especially distance learners typically adopt a very strategic approach to their studies, with many students aiming for the best outcome given the time available, rather than necessarily the best outcome they are capable of achieving without time constraints. Feedback can be effective in driving learning and keeping students engaged and on track (Li & De Luca, 2014; Price et al., 2011). Each AL typically tutors on more than one module, so marking periods often coincide, and meeting rapid feedback targets is challenging, a situation exacerbated by the increase in tutor group size from 15 to 20 from 2010. Motivation of students is undoubtedly a key tutor role (Simpson, 2012). This is achieved through prompt feedback, one-to-one communication by phone/email, and the monitoring of student progress or engagement with the course, so that timely and appropriate interventions can be made. Many of the more mechanical aspects of record-keeping

and progress-chasing are covered by Student Support Teams (SSTs), but tutors play a significant role in understanding the student's situation, advising students as to best use of limited time, offering interventions to address issues and acting as intermediary between the student and university systems where appropriate. The successful integration of SST and tutor interventions to ensure no overlaps or gaps is a work in progress.

The advent of relatively robust technologies for synchronous online meetings from the mid-2000s provided new opportunities for the tuition of our geographically widely distributed student body. Originally tutorials were entirely face to face and included a compulsory 5-day residential school. More recently we have used a blend of face-to-face events – such as tutorials, 'day schools', and weekend 'revision' schools, held in geographically central locations – and online events, with the precise mix flexed to suit the particular cohort. Now tuition is entirely online, with all tutorial events published well in advance of module start, the latter a feature of the new university tuition policy (The Open University, 2014a). Tutorials are a mix of those open to all students on the module – including 'masterclasses' dealing with key topics, seminar style – and those specific to a tutor group. This has evolved because there was often insufficient 'critical mass' to generate effective discussion in individual tutor groups and that provision of a wider choice of tutorial events facilitates higher levels of participation. An important additional benefit is that it gives students access to a wider peer group, from different backgrounds or sectors but who may be working with similar technology or innovation management issues. It also facilitates formation of informal study groups who organise themselves to meet online or, when geography permits, face-to-face. Recordings of online tutorials are available to extend at least some of the value of the events to non-participants. There are many studies in the literature demonstrating that learning outcomes are met equally effectively whatever the tuition regime, online or face to face (Cavanaugh & Jacquemin, 2015; Jennings & Ottewill, 1996; McCutcheon, Lohan, Traynor, & Martin, 2015; Richardson, 2009). However, the loss of all face-to-face tuition is seen by many staff and students as a retrograde step. Ways to build in opportunities for face-to-face interaction such as the reinstatement of optional residential schools are under discussion.

Online discussion forums meet a variety of needs. Both tutors and students actively participate to raise and answer queries, to share information about forthcoming tutorials, and to stimulate academic debate through raising topical issues or recent academic publications as points of discussion. This last has emerged as a popular thread providing unplanned but effective learning opportunities.

Tutors identify where students would benefit from further help, mainly through their marking of assignments and informal communications with students such as dealing with student-raised queries. Interventions available include signposting to additional resources and/or arranging 'special sessions' such as one-to-one telephone or online tutorials to provide specific help.

Student satisfaction with tuition is generally high, as evidenced by the end of module surveys – 90% ('satisfied' or 'very satisfied') is not unusual.

4 Conclusions and Implications

To date, the combination of planned and emergent development of the ATS has worked well. Many effective features of the ATS are very much prescribed by institutional policies and processes, but equally there are many successful aspects that have been emergent. The ATS is effectively an 'umbrella strategy' where 'the broad outlines are deliberate … while the details are allowed to emerge en route' (Mintzberg et al., 1998). Effective strategists mix emergent and prescriptive strategies 'to reflect the conditions at hand…to predict as well as…to react to unexpected events' (Mintzberg et al., 1998, p. 12) or, as Cunha et al. put it, to provide a 'combination of freedom and direction' (Cunha, Palma, & da Costa, 2006, p. 951). The term 'planned emergence' has been coined (Grant, 2003) to capture the need for synthesis between mechanistic (top-down) and more organic or bottom-up strategy processes in complex or turbulent environments, in order to provide flexibility and facilitate innovation (Dibrell, Craig, & Neubaum, 2014).

One of the greatest strengths of the TIM programme is the centrality of the assessment strategy to the overall learning design. This is well-aligned with university assessment policy and with established pedagogy, but probably owes at least as much in practice to emergence of our approach via learning from experience.

The high quality of assessment feedback is also a consequence of university policies and processes, reinforced by excellent tutors, in turn underpinned by the module team's engagement with recruitment and selection, timely and thorough monitoring of tutor work, and proactivity in supporting tutors, including through staff development activities and face-to-face module briefings. Continued tuition excellence depends on our continued ability to attract and retain excellent tutors and to provide appropriate staff development. The role of staff tutors who manage groups of tutors is crucial, and we depend considerably on prescriptive institutional policy in this respect.

But designing or prescribing approaches achieves only so much. There is much of value to be learned from the tutor and student experience, sensed via informal and formal feedback, and trials of new approaches. Exploration of how students engage with feedback, of ways to enhance assignment authenticity, and of additional opportunities for informal feedback are examples of how improved assessment and tuition strategy could be shaped. An overarching strategy of 'planned emergence' will ensure awareness that improvement opportunities are maintained and that there is sufficient flexibility to respond to them.

Online learning tools provide the means to implement 'planned emergence'. They allow student needs and preferences to be identified in real time, for example, by the monitoring of student use of online learning resources and facilities. They also support cost-effective provision of an appropriately flexible response such as provision of a range of optional online study resources from which students choose to suit their needs, or the configuration of tutorials and other tutor support according to the nature of the student cohort, or even flexibility of module start dates and assessment deadlines. There is thereby the potential for genuine 'personalization' of learning – to customise the learning experience for each and every student.

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