Electronic management of assessment: business processes, system requirements and institutional capability

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1. ABSTRACT

This paper reports the final outcomes of a programme of work looking at the electronic management of assessment (EMA) that was carried out in collaboration with UK universities, national agencies, system suppliers and the EUNIS membership.

Collaboration via the EUNIS e-Learning Task Force has allowed cross-fertilisation of ideas and sharing of resources at the European level. We report on some of the outcomes of this work and suggest how individual universities can use the resources to build capacity in their own institution.

2. INTRODUCTION

This paper is the fourth in a series looking at enhancement of assessment and feedback practice in UK universities and the lessons to be learned for the wider EUNIS community. The first paper (Ferrell & Sheppard 2013) presented a landscape review which showed that, although assessment and feedback lies at the heart of the learning experience, it remains the single biggest source of student dissatisfaction with the UK higher education experience. Subsequent papers (Ferrell & Stewart 2014 and Ferrell & Gray 2015) analysed the problems from both institutional and systems perspectives and looked at tools and approaches that were being successfully applied to tackle all of these issues.

This paper reports the final outcomes of this programme of work carried out in collaboration with UK universities, national agencies, system suppliers and the EUNIS membership. We have amassed a significant amount of knowledge and guidance about good practice. The goal now is to help universities make effective use of the available guidance in their own context.

Throughout this paper we use the term electronic management of assessment (EMA). This describes the way technology can support the management of the entire life cycle of assessment and feedback activity, including the electronic submission of assignments, marking, feedback and the return of marks and feedback to students.

3. FINDING COMMON GROUND

At first sight it seemed as if we were tackling issues too diverse and complex to make any sense of them in a single university let alone deliver solutions that were applicable UK wide and ultimately useful to all EUNIS members.

The first big step forward came when, building upon the work of EUNIS Elite Award winners 2014 Manchester Metropolitan University (Stubbs 2014), we were able to define an academic model showing a high level view of the academic processes involved in assessment and feedback. The assessment and feedback lifecycle shown below was found to have widespread applicability across UK higher and further education and work with the EUNIS e-Learning Task Force revealed that it was similarly useful in the wider European context.
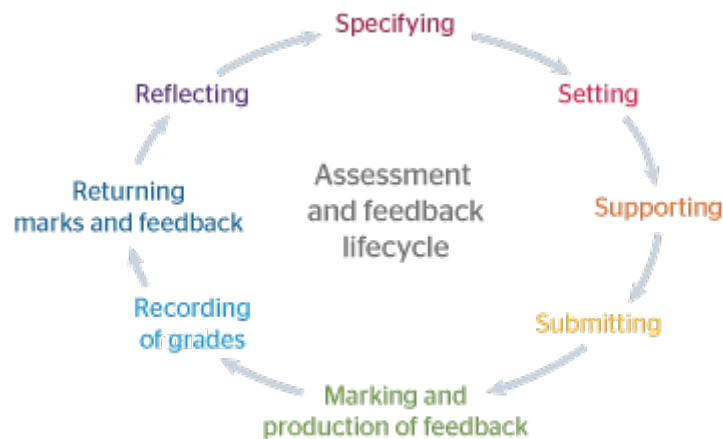
Figure 1. The assessment and feedback lifecycle
(adapted from an original by Manchester Metropolitan University) CC BY-NC-SA

The lifecycle model offers a ready means of mapping business processes and potential supporting technologies against the key academic stages. Use of this approach allowed us to have conversations about common issues with business processes and systems within a shared frame of reference that transcends institutional differences.

Through surveys. workshops and working groups we identified and prioritised the key issues (for more on this see Ferrell & Gray 2015) and implemented series of solution finding projects. The main outcomes of this work are:

- An online guide Transforming assessment and feedback with technology

- An online guide Electronic management of assessment (EMA) in higher education: processes and systems

- A generic set of system requirements (developed in collaboration with EUNIS member UCISA) and responses to those requirements from many suppliers

- A self-assessment tool to support capacity building with regard to the electronic management of assessment (to be launched for EUNIS 2016)

Through our collaboration with the EUNIS e-Learning Task Force, we discovered that a national project in Norway to review the process of managing digital exams in universities was taking an approach very similar to our own. They used the Archi modelling tool, originally developed by Jisc, to develop a series of process maps defining the steps universities need to take to move from current practice to a desired future state that cuts out unnecessary manual actions. As with our lifecycle model and generic process maps they concentrate on essential tasks for all universities and identification of the role responsible for each task rather than the sequencing of workflows that varies between institutions.

As a result of this work Norway now has a model IT architecture for digital assessment that is platform independent and based on recognised international standards:

- The Norwegian report on ICT architecture for digital assessment (Melve & Smilden 2015) complements the Jisc resources

The EUNIS e-Learning Task Force connection also brought us into contact with complementary work being carried out in the Netherlands by SURF:

- The Dutch Digital Testing project site has many useful resources

4. UNDERSTANDING THE BUSINESS PROCESS

Using a similar approach to the Norwegian project, we reviewed the business processes associated with assessment and feedback - particularly those around submission, marking and feedback which our research showed were the most problematic areas of the lifecycle. We produced a set of visualisations to describe the main academic practices and the key variables that influence decisions thus reducing the 'noise' around differences and focusing on what is pedagogically significant. Figure 2 shows our model of the core tasks carried out by all UK universities.

We invited universities to compare our model against their own practice and ask the following questions:

- Are you doing additional tasks - if so, why?
- Are the tasks being done by the right people eg do you have academic staff undertaking administrative duties that do not require academic judgement?
- Do you have systems that could carry out some of the tasks you are doing manually?
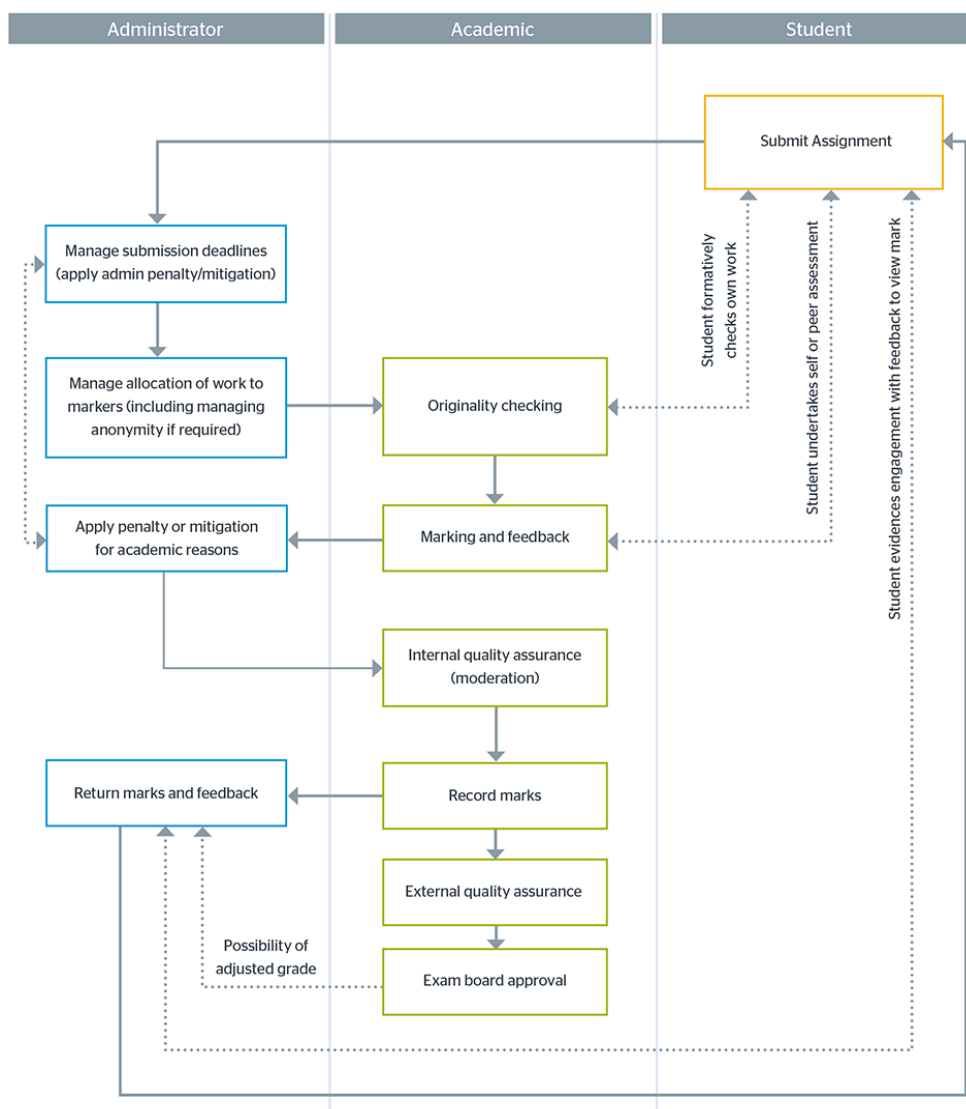- Do you have multiple ways of performing the same task - if so, why?

Figure 2 Submission, marking and feedback process ©Jisc and Bonner McHardy CC BY-NC-ND

5. DEFINING SYSTEM REQUIREMENTS

As well as supporting process improvement, the generic overview allowed us to work with universities and UCISA to define a set of system requirements that are representative of UK wide needs.

The generic overview was broken down into a more detailed view of the submission process and the marking and feedback process showing the system requirements for each task. The system requirements are also available as a template that can be used as the basis for universities to adapt in an Invitation to Tender (ITT).

A range of system suppliers completed the template comparing their product features against the requirements and these have been published on the Jisc EMA blog to aid universities and colleges better understand the ways in which particular systems can support their needs and to see how particular combinations of systems might work together. Interestingly the EUNIS connection prompted interest from suppliers across Europe some of whom are not currently operating in the UK market.

6. INDICATORS OF EMA MATURITY

As a result of this body of work, we were able to identify a series of key factors that universities need to think about in relation to their assessment practice and these became the indicators of institutional EMA maturity.

6.1. STRATEGY/POLICY AND QUALITY ASSURANCE

A key indicator of maturity is the extent to which institutions have moved towards ensuring that electronic management of assessment is enshrined in their formal strategy, policies and procedures. Responsibility for assessment and feedback policy and procedure is often devolved to local level within institutions so it can take some time for good practice involving new use of technology to become normalised. During the early stages of adoption there will be many pilot projects but for these practices to become embedded such that they are the normal way of doing things requires a more directive approach. As institutions become more confident in the benefits of EMA they tend to offer fewer possibilities of 'opting out' of the digital approach.

The persistence of organisational myths surrounding policy and quality assurance processes is actually a significant barrier to change. The tendency to do things the way they have always been done can often be perpetuated by a belief that this is somehow enshrined in policy. Academics are often surprised to find that many characteristics of existing processes are matters of historic choice rather than regulatory issues. They are often surprised at how few regulations there actually are or how easy it is to make changes to perceived barriers in the regulatory frameworks. Variation in how staff apply assessment policy across an institution is thus often down to such myths about what actually constitutes the policy in the first place.

6.2. CURRICULUM DATA

Good quality data about the academic curriculum and how it is assessed is essential. Simply having easy access to information about what learning outcomes are being assessed, how they will be assessed and when feedback and marks are due, can greatly improve student satisfaction. Assessment remains an area where much information is still paper-based. Having information in digital format can facilitate the transfer of data between systems and cut out manual entry. The corollary of this is that the more technology is used, the more errors and inconsistencies in data become visible.

Many institutions operate ineffective assessment regimes because they simply do not have sufficient information about what is being assessed. Basic analytics on assessment practice can help avoid a range of issues such as assessment 'bunching' impacting staff and student workload, over-assessment or assessing certain learning outcomes many times whilst ignoring others. Good information management is a very significant indicator of institutional capability.

6.3. PROCESSES AND WORKING PRACTICES

Many institutions struggle to get the most out of their information systems due to the variety and complexity of their business processes. Large universities rarely have a single, institution-wide, business process for a given function. Different faculties, schools, departments and programmes each have their own way of doing things and this variation can prevent them from achieving the efficiencies and benefits possible through EMA technology.

Any organisation with many different ways of carrying out the same activity is likely to need a series of time-consuming and cumbersome workarounds to adapt their information systems to these bespoke approaches. We found that standardisation of business processes is necessary before universities can move beyond large scale pilots to institution-wide implementation of EMA.

6.4. TECHNOLOGY

The capability of existing commercial systems to meet institutional requirements is often voiced as a concern. However, we found that data and business processes are equally, if not more, relevant issues. Participants in our research frequently commented on the extent to which new technologies are 'bolted on' to old processes without people really taking the time to stand back and consider what the process is really intended to achieve. All of the issues noted above make it difficult to get the most out of existing technologies.

Universities that operate in a very decentralised way often allow individual parts of the business to choose their own software tools which means they end up with multiple tools that can all do the same job. In IT terms it makes sense to streamline this complexity and give preference to tools that integrate well together to reduce duplication/data entry.

6.5. CULTURE

Institutional culture is a complex area. Factors that can make it difficult to improve assessment practice include: the decentralisation of decision making and, hence, the diversity of practice already noted and the culture of universities that reward research excellence to a far greater extent than excellent teaching. Risk aversion is also a significant issue as neither staff not students want to take risks with something as important as assessment.

6.6. STUDENT EXPERIENCE

There is a wide spectrum of approaches to student engagement in assessment practice and the extent to which the culture promotes assessment literacy and student understanding of the processes involved in making academic judgement. An example of such a difference is whether a university uses text matching tools (such as the Turnitin or Urkund products) as plagiarism detection support for academics or as a formative tool for students to support the development of academic writing skills.

Some universities still take a view that good students will inevitably succeed and a few will need remedial support. Others realise that assessment literacy is a skill to be developed (by both students and staff) and have their students actively involved in changing academic practice. There is also variation in the extent to which assessment is used to develop employability skills by using assessment types (such as group work and peer review) that reflect the world of work more closely that more traditional methods such as essays and closed book exams.

7. MEASURING EMA MATURITY

In response to demand from UK universities we developed a self-assessment tool that EUNIS members are welcome to use or adapt for their own purposes. We recognise five levels of EMA maturity:

Researching	You are at an early stage of EMA. You do not seem to have a comprehensive view of organisational activity overall; policy, process and systems seem fragmented. Ensure you have senior management support to undertake further investigation. Start by defining the principles that underpin assessment and feedback in your organisation and find the areas of good practice you can build on.
Exploring	You are probably aware of pockets of good practice but have not really begun to try to scale this up. You will need to be clear about expected benefits in order to effect the cultural change needed.
Embedding	You are at a tipping point where fairly widespread experimentation is close to becoming mainstream practice. A key issue will be ensuring that business processes are sufficiently consistent to support a more holistic approach.
Enhancing	You are probably already supporting the core of the assessment and feedback life cycle with technology. You are looking to fill gaps and find more elegant solutions to existing workarounds.
Pioneering	You are looking to go beyond automation, standardisation and efficiency gains to ensuring that EMA has a truly transformative impact on learning and teaching in your organisation. Your organisation is probably a provider of many of the resources in our accompanying guide but we can still provide some inspiration and support.

Completion of the self-assessment questions generates a report rating the respondent at one of the five levels against each of the key indicator headings: strategy/policy and quality assurance; curriculum data; processes and working practices; technology; culture; student experience.

The report gives a set of suggested actions intended to help build on strengths and address limitations. It also provides links to resources that might help you carry out the suggested actions.

8. LESSONS LEARNED FROM SELF-ASSESSMENT PILOT

We piloted this approach at the end of 2015 with twelve universities (including three EUNIS members) which provided valuable lessons.

Overall the participants reported that the outcomes matched their own understanding of their strengths and weaknesses and that the suggested actions fitted with their experience of how to make progress in each of these areas.

8.1. LEVEL OF GRANULARITY

During the pilot however it became clear that our focus on the whole institution was too broad. Universities with very decentralised structures, and those at the early stages of EMA maturity, tend to exhibit very different profiles in different parts of the institution. These institutions need their action plan and supporting resources at a level of granularity individual to each of their component business units.

We thus redesigned the self-assessment to work at different levels. Respondents are now asked to define what happens in their 'organisation' in many of the questions. Organisation in this case refers to the coherent entity on behalf of which they are responding so it may be a programme team, a department or the whole institution. We also ask about consistency across your 'component areas'

and practices at 'local level'. At institutional level component areas/ local level will generally be schools or faculties, at department level they may be programmes of study and at programme/ course level they may be individual modules.

8.2. MOVING BETWEEN LEVELS

Our five level scale reflects the increasing use of EMA bringing further benefits for students and institutions. Our pilot showed that it should however be viewed with a number of caveats.

The scale is not a simple linear one. The first two levels are quite similar in terms of the user experience. You may correspond to the researcher level because your institutional practice is disjointed and people do not have a clear idea what others are doing. However, the overall user experience may not be significantly different to that of institutions at the explorer level.

Institutions have also reported that the amount of effort needed to move between levels is not equally distributed. The most significant amount of effort is needed to get from the early stages to the embedding and enhancing levels. Once there, further progress is proportionately easier to achieve.

Progress through the levels is associated with evidence of greater benefits but that is not to say that every institution will necessarily be aiming to reach the highest level. In some cases institutions may provide an excellent student assessment experience in spite of constraints on how much they can invest in supporting information systems.

8.3. DATA VALIDITY

In many cases it may not be possible for an individual to answer all the questions. Indeed, we suggest that the self-assessment should be done as a group exercise because the dialogue that ensues is the first stage in the change process.

There will always be some concerns about the validity of data from a self-reporting exercise such as this. Different people may have a different interpretation of some of the questions and responses and it is only through dialogue that such differences can be explored and enhance the institutional knowledge base. Most of those involved in the collaborative development of this tool found the dialogue instigated by the self-assessment process to be the most valuable aspect of the activity. We therefore suggest the tool is best suited to supporting continuous improvement rather than any kind of benchmarking.

Whether your approach to developing EMA capability is top-down or bottom-up and whether you are a policy maker or a practitioner, you will probably find that you want to compare results from different parts of your institution. This will help you target staff development, select areas to pilot new approaches and identify good practice that can be built upon.

9. SUMMARY

Assessment lies at the heart of the learning experience and universities right across Europe are trying to get to grips with moving traditional practice into the digital age. The drivers for this are both the need for efficiency and the need to meet the expectations of students who have grown up in that era and who need university to prepare them for a digital future.

Collaboration between members of the EUNIS e-Learning Task Force has shown that, even with a topic as complex as this, we can find common ground and benefit from sharing experience.

Find out more from:

Jisc guide: [Transforming assessment and feedback with technology](#)

Jisc EMA blog: http://ema.jiscinvolve.org/wp/

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11.   AUTHORS' BIOGRAPHIES

Gill has teaching and research experience and has held senior management positions in a number of university administrative functions as well as directing a UK support service enhancing the use of ICT in further and higher education. She acts as a consultant to universities and national agencies in both the UK and Europe and has been an invited speaker at many national and international events. Current interests include: data and information management, technology enhanced learning, assessment and feedback and learning space design. She was a EUNIS Board member from 2010-2015 and is currently leader of the EUNIS e-Learning Task Force.

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Lisa is a Senior Co-Design Manager within the Student Experience team at Jisc, providing leadership on the use of technology-enhanced learning and teaching in Higher and Further Education. For 10 years she has led a range of innovation and change programmes on the themes of technology-enhanced assessment and curriculum transformation. Lisa has spoken widely on the many ways that technology can enhance assessment and feedback and on the use of e-portfolios to support learning, and has orchestrated a range of highly regarded activities in these areas including the development of advice and guidance materials and a series of national workshops.

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