# 5/10 'Must try harder': applying technology to the management of assessment and feedback.

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**Keywords**

Assessment, business processes, educational principles, feedback, feed forward, formative, integration, life-cycle, online submission, online marking, pedagogy, summative.

## 1. ABSTRACT

This paper focuses on the information systems that are being used in support of assessment and feedback activities. It takes a generic 'life-cycle' view of the overall process and looks at how systems (particularly commercial off-the-shelf systems) relate to academic practice. Throughout the paper the term electronic management of assessment (EMA) is used to describe the way that technology can be used to support the management of the whole assessment and feedback lifecycle, including the electronic submission of assignments, marking, feedback and the return of marks and feedback to students. We look at common issues in the fit between systems and practice and measures that are being taken to address the issues and fill the gaps.

## 2. INTRODUCTION

This paper is the third in a series looking at the enhancement of assessment and feedback practice in UK universities. A paper to EUNIS 2013 (Ferrell & Sheppard 2013) presented a review of the overall landscape and noted that, although assessment and feedback lies at the heart of the learning experience and forms a significant part of both academic and administrative workload, it remains the single biggest source of student dissatisfaction with the UK higher education experience. The review looked at a body of work aimed at defining the educational principles and good pedagogic practice that institutions were looking to achieve. A subsequent paper to EUNIS 2014 (Ferrell and Stewart 2014) further analysed the issues in relation to pedagogy, process and people and looked at tools and approaches that were being successfully applied to tackle all of these issues.

This paper focuses on the information systems that are being used in support of assessment and feedback activities. It takes a generic 'life-cycle' view of the overall process and looks at how systems (particularly commercial off-the-shelf systems) relate to academic practice. Throughout the paper the term electronic management of assessment (EMA) is used to describe the way that technology can be used to support the management of the whole assessment and feedback lifecycle, including the electronic submission of assignments, marking, feedback and the return of marks and feedback to students. We look at common issues in the fit between systems and practice and measures that are being taken to address the issues and fill the gaps.

The paper draws upon the work of the UK wide Jisc Assessment and Feedback programme (2011-2014) and work currently being undertaken under the auspices of the Jisc Electronic Management of Assessment project.

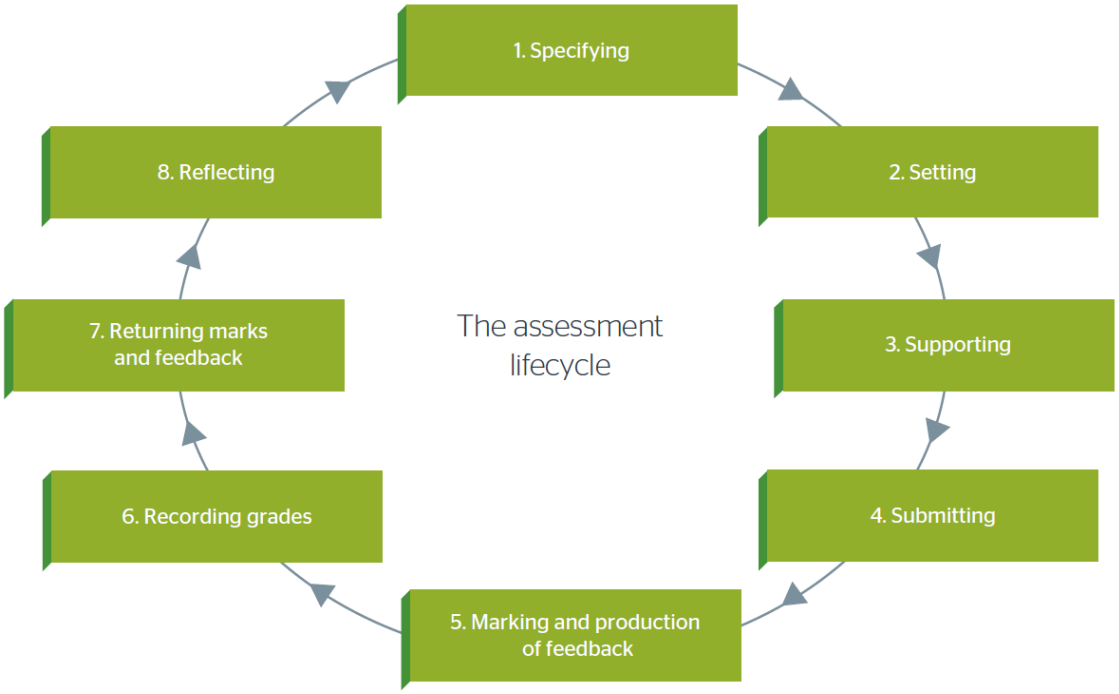
Recent research has highlighted the need for effective assessment and feedback practice to the underpinned by a shift from assessment ***of*** learning to assessment ***for*** learning as evidenced by a shift in the balance from summative to formative assessment and greater learner ownership of the processes related to their own learning such that they are better able to make evaluated judgements and gauge their own progress.

Technology plays a fundamental role in achieving these goals and increasingly colleges and universities are seeking to integrate institutional information systems to provide a single coherent point of access to assessment and assessment-related data. The aim is to minimise the administrative overhead involved in handling of paper and input of data and to allow students

personalised access to information about assignment types and deadlines, assessment records, feedback from previous assignments and their e-portfolios. The idea of a fully integrated suite of systems that support the most effective learning and teaching practice and minimise routine administrative tasks remains however a 'Holy Grail' for most institutions. Many institutions still have discrete systems which are not able to exchange data and many assessment related processes remain almost entirely manual or paper-based whether through staff choice, lack of available technology tools or a combination of the two.

## 3. A LIFE-CYCLE VIEW

In trying to review assessment and feedback practice overall it is easy to feel initially overwhelmed by the diversity of the landscape. Every institution develops its own policies, procedures and practices - usually the responsibility for this is highly devolved so there can be very different policies and practices between different departments or schools even within a single University. In trying to make sense of the overall picture, a tool that has proven very useful in providing a common starting point is the assessment and feedback life-cycle shown below.




Originally developed by Manchester Metropolitan University, the life-cycle is fundamentally an academic model and the way in which it shows a high level view of the academic processes offers a ready means of mapping business processes and potential supporting technologies against this. Use of the model has therefore been central to cross institutional research in terms of serving as a framework to gain a holistic picture of institution wide activity.

There are 8 main stages in the life-cycle: at a more detailed level the processes also include: assessment scheduling; submission of assignments; tracking of submissions; extension requests and approvals; academic integrity; academic misconduct processes; examinations; marks recording; moderation and external examining. The life-cycle is presented in a cyclical fashion to emphasise the iterative nature of many of these activities (even though many of the participants in Jisc research have highlighted the fact that some of their processes and information systems actually work in quite a linear manner).

The model is intended to be pedagogically neutral (more about asking the right questions and stimulating thought than having a basis in any particular pedagogic stance) and it can be applied to both formative and summative assessment and to any scale of learning e.g. from whole

courses/programmes of learning or to short pieces of learning such a short course that takes place over a single day. The model covers all assessment and feedback practice whether or not materials are in digital format and supported by information systems therefore it suits our purpose as a model for EMA as opposed to the narrower EAM (the term electronic assessment management is often used interchangeably with EMA - our thinking on this is that EAM implies the management of assessments that exist in digital format whereas EMA is a much broader term).

At the start of the research there was a general feeling that stages 2-4 are better understood and less problematic than some of the other components of the life-cycle, not least because many institutions are managing all of the related information within a single VLE system. Stages 5-8 were felt to be where we begin to open Pandora's box … This proved to be borne out by the findings of the research.

## 4. USE OF TECHNOLOGY THROUGHOUT THE LIFE-CYCLE

In April 2014, 70 HE providers responded to a questionnaire about their use of EMA. It seems that while most institutions are using technology to support some elements of the life-cycle, very few yet have joined up institutional approaches. Many institutions are at a stage where they have piloted new approaches in particular parts of the University and are starting to think about a more strategic approach applying technology consistently across the institution.

Electronic submission of assignments appears to be considerably more widespread than other aspects of EMA: 32% of respondents had already mandated e-submission on an organisation-wide basis and only 3% of respondents told us their institution was not doing anything in this area.

There is widespread evidence of student demand for feedback in electronic format and 34% of respondents had e-feedback mandated in parts of their institution although only 20% had an organisation-wide mandate for e-feedback. The irony that this means some students are required to submit work electronically yet they receive handwritten feedback on paper, does not go unnoticed by learners.

Earlier research had indicated that students and administrative staff are generally more enthusiastic about EMA than academic staff so it is perhaps unsurprising that electronic marking of assignments is lagging behind other aspects of EMA. Some 32% of respondents did have local mandates for e-marking and 10% had made e-marking compulsory institution-wide. A similar number (11%) were however not actively investigating e-marking at all.

E-exams appears to be the most immature area in the UK: 26% of respondents told us they weren't currently looking at this area. 39% had undertaken small-scale pilots and 13% large-scale pilots. There is little mandatory use of e-exams and the practice seems best developed in health related subjects in HE. The picture is rather different in the further education sector where many awarding bodies stipulate the use of online exams. There is however widespread small-scale use of online assessment with a wide variety of tools in use. The current lack of activity in the area of e-exams appears to be one of the most significant differences between the UK and other parts of Europe especially the Netherlands and Nordic countries where e-exams are taking place on a large scale.

Despite the diversity of UK academic practice, there is a limited range of core technologies supporting EMA on an institution wide basis. The key systems are generally:

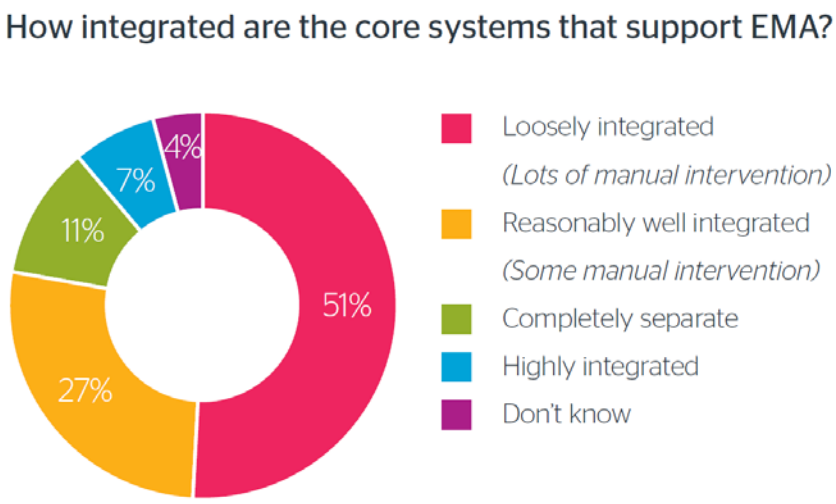
- student record system: as the home of definitive grading information.
- VLE: used for feedback and marking.
- dedicated assessment platforms: with the submission, originality checking, feedback and marking functionality in the Turnitin product suite being widely used.

Looking at the combination of these systems, two main options predominate: and between them SITS/Blackboard Turnitin and SITS/Moodle/Turnitin account for almost half of institutions (the SITS/Blackboard Turnitin combination accounting for around 25% of HEIs being the most common. The rest of the variation is largely accounted for by the different student records systems in use although there are a variety of other VLEs (including Sakai, Canvas and Desire2Learn) and one

institution identified that it was using the Ephorus originality checker (this company has subsequently been bought out by the owners of Turnitin).

Many institutions do however have more than one tool that can potentially carry out the same functions therefore individual departments and staff often have considerable choice in selecting the most appropriate tools to underpin their day-to-day assessment practice. Of the 2014 survey respondents only 16% said that their institutional use of EMA technologies was 'highly standardised'. The largest proportion (54%) had a standard core supplemented by local variation and 28% had considerable localised variation (2% did not know).

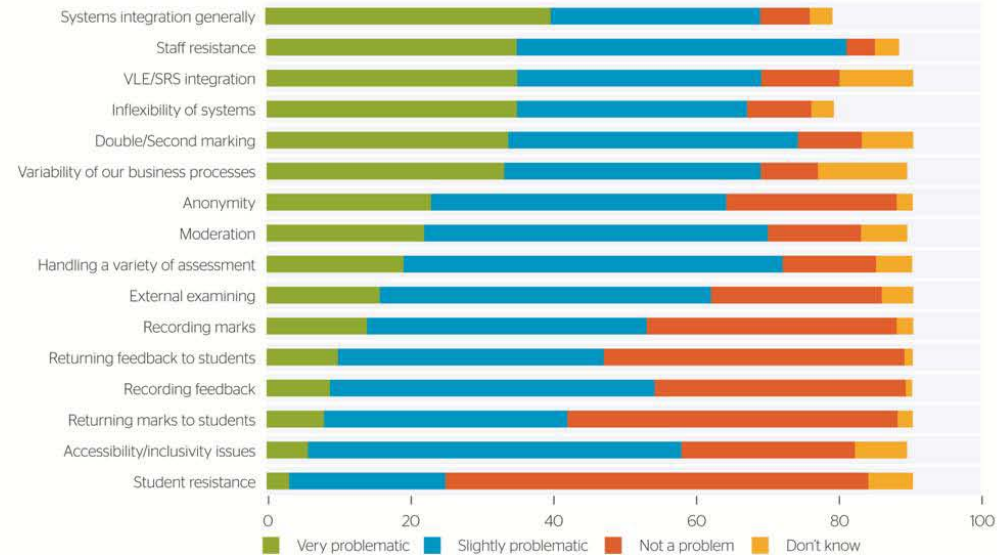
Despite the relatively limited nature of the core product set, the key integration points between these technologies remain problematic and a source of considerable manual intervention. We asked about levels of integration between the core systems i.e. the extent to which data is held in a one system and passed to other systems that need it rather than manually input to each system: there were more respondents (11%) who said their systems were 'completely separate' than who said their systems were 'highly integrated (7%). Interestingly only three universities said their systems were highly integrated (one of these was making relatively limited use of EMA) and the others in this category were all providers of HE in FE.




Aside from the sheer amount of administrative effort required to transfer data between systems, a number of other issues were identified such as problems caused by different systems storing marks in different ways and the risk of error due to rounding in multiple systems and the difficulty of supporting anonymous marking in that anonymity may be possible in one system but lost as soon as data is transferred to another.

## 5. PAIN POINTS IN THE LIFE-CYCLE

We asked about the key pain points in relation to EMA. Below is a summary of responses to the prompts provided. The chart shows the broad profile of 90 responses (not all respondents commented on all of the prompts). Grouping together the various points around systems integration and inflexibility of systems, it is clear that this is the biggest problem area for the majority of institutions. Issues relating to pedagogy and institutional culture and process do however feature very strongly: with over 80% of respondents indicating that staff resistance is problematic to some extent. Business process issues were also identified as a major source of pain: interestingly the response about business processes also had the largest number of 'don't knows' probably reflecting the general level of opacity around this topic.

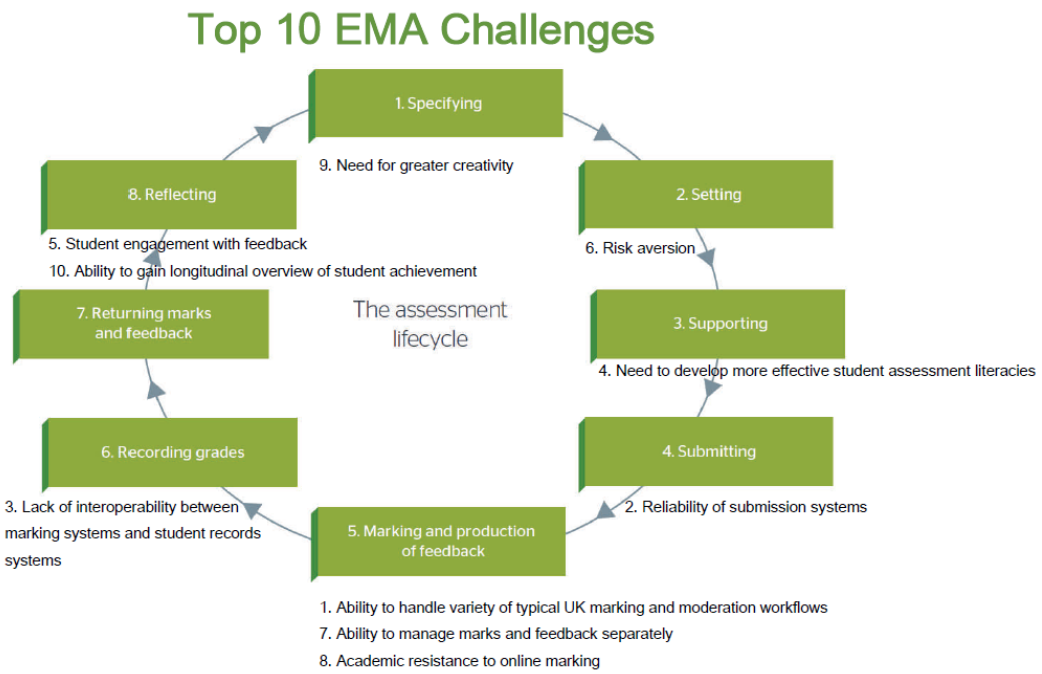



The interplay between the factors involved i.e. people processes and systems, is complex: it is evident that the existing commercial and open source systems do not effectively support all of the existing processes but there are equally some cases where process improvement could clearly be achieved. Similarly, we heard some quite harsh comments about institutional culture but it is clear that experiences with immature or unreliable technologies can turn neutral (or even slightly positive) early adopters into resisters.

Top-down approaches are very often at odds with the culture, certainly in higher education, and many institutions are taking the approach of strongly encouraging all aspects of EMA without the element of compulsion until the practice is strongly embedded.

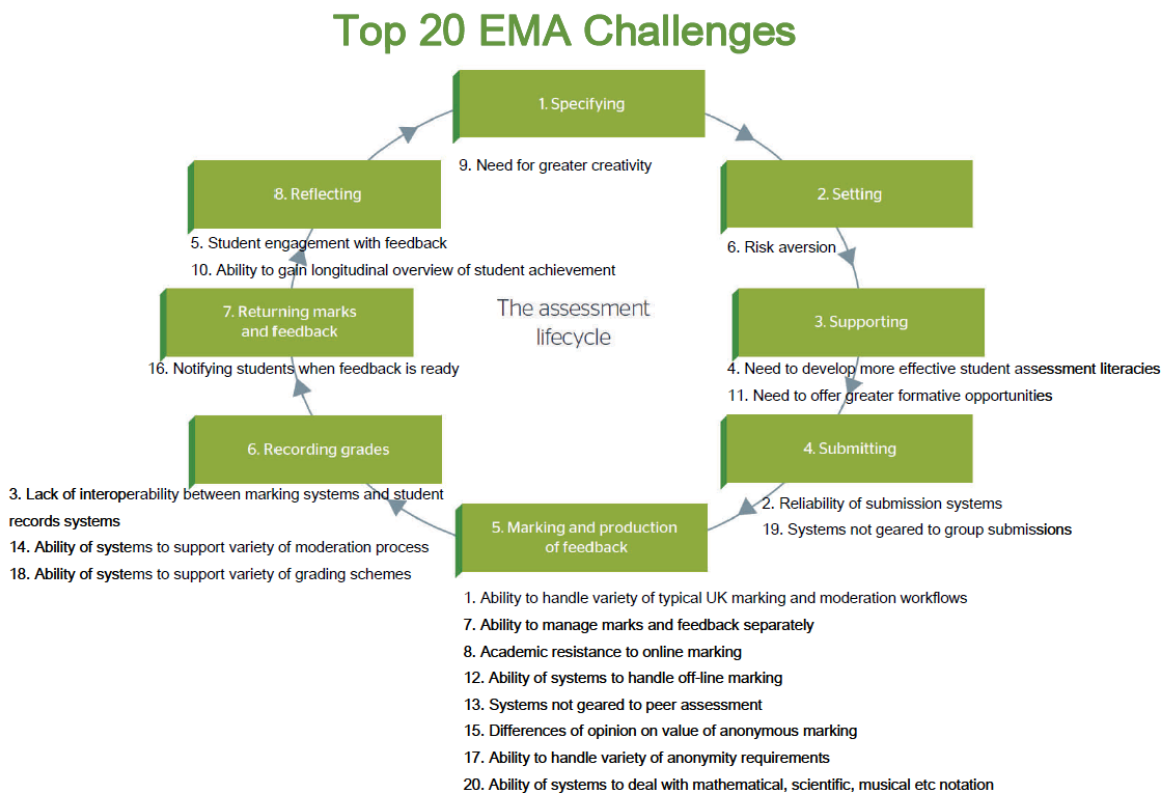
We analysed the detailed responses to these prompts in order to identify 20 specific challenges commonly faced by institutions. We then undertook further work with a range of different stakeholder groups (mainly learning technologists, academic managers and staff developers) to identify which of the challenges were the most significant and had the greatest impact on stakeholders. We then mapped these challenges against the life-cycle.

Top 10 challenges mapped against life-cycle.




Mapping the top 10 challenges bore out the initial suspicion that most of the problems arise during the period from submission onwards. The grouping of issues around areas 5 and 6 (the marking and production of feedback and the recording of grades) becomes even clearer when the top 20 challenges are considered.

Top 20 challenges mapped against life-cycle.



Marking and production of feedback appears to be the most problematic component of the life-cycle as it is the area where variety of pedagogic practice results in a situation where the fit between institutional processes and the functionality of commercially available systems is least well matched. We heard a very clear message from universities that existing systems do not adequately meet institutional requirements in these areas. A basic issue is that marks and feedback are different things and need to be handled differently whereas technology platforms tend to conflate the two. It was also observed that systems seem too often to be predicated on an assumption that 1 student = 1 assignment = 1 mark. This model may usually be adequate for formative assessment but does not meet UK requirements for summative assessment processes. Systems would ideally offer a range of different workflows based on different roles e.g. first marker, second marker, moderator, external examiner etc. University participants in the research did however express some sympathy for the system suppliers' position in the sense that there appears to be such diversity of practice that is inconceivable that any system could meet all of the different requirements

## 6. WORKING TOWARDS SOLUTIONS

Following the articulation and prioritisation of the challenge areas, Jisc has been working with both institutions and suppliers to identify feasible solutions to the most common problems. The community initially identified 30 solution ideas that group under five main headings.

**Solution Group 1. – Common Workflows**

Challenge/s addressed: Ability to handle variety of typical UK marking and moderation workflows/ Ability to manage marks and feedback separately.

A range of ideas were proposed around identifying, validating, specifying and gaining consensus around a common set of marking and moderation workflows. The idea was that if we are able to narrow down the diversity of approaches into a set of common models it could help to both inform systems suppliers to influence how systems develop to support those workflows; and also to inform new systems development. The ideas ranged from simply documenting these workflows in broad terms through turning them into more detailed specifications, to the idea of actually building 'plug and play' modules

**Solution Group 2. Holistic Feedback Hub**

Challenge/s addressed: Student engagement with feedback/ Ability to gain longitudinal overview of student achievement.

There was consensus around the need for a more programme level/holistic view of feedback, for both tutors and students, to enable a more longitudinal view of student development as well as potentially facilitating greater engagement with feedback. One proposed solution was to develop a 'holistic feedback hub', where students and staff can access a programme level view of student feedback. Another idea was for students to be empowered and enabled to take more ownership of pulling together a programme level view of their feedback by gathering this in their personal spaces (such as an e-portfolio).

**Solution Group 3. Reliable Submission**

Challenge/s addressed: Reliability of submission systems.

The ideas in this space focused around making the technical process of submission as simple as possible and clarifying policies and procedures to avoid stress and confusion when things inevitably do go wrong. It was suggested there is a need to analyse all of the possible points of failure and decouple the physical act of submission from the workflows within other EMA systems so that submissions can be acknowledged and held until other functions are in a position to proceed. Policies, procedures, guidance and examples need to encompass the workarounds to deal with points of failure.

**Solution Group 4. Interoperability**

Challenge/s addressed: Lack of interoperability between marking systems and student records systems/ Ability of systems to support variety of grading schemes.

The ideas relating to this topic covered both data management and technical interoperability. It was suggested there was a need to identify the minimum data storage requirement for each type of system and to consider whether each institution is carrying out functions in the most appropriate system and storing the data in the most appropriate place. There is a need to exchange good practice and existing solutions for common integrations and it was suggested we could go so far as to build some integrations where there are gaps.

**Solution Group 5. Good Practice Toolkit**

Challenge/s addressed: Need to develop more effective student assessment literacies/ Risk aversion/ Academic resistance to online marking/ Need for greater creativity.

A number of solution ideas were proposed relating to the development of guidance and examples to promote an 'assessment for learning' rather than 'of learning' approach. The suggestion is for some form of toolkit which should address the question 'what does good assessment design look like?' and enhance both staff and student assessment literacies.

## 7. NEXT STEPS

In April 2015 work began on a number of the solution areas outlined above:

- Solution area 1 - common workflows is proceeding as a project. The aim of this project is to review the workflows associated with the assessment and feedback lifecycle (particularly those around marking and feedback) and produce a set of visualisations that describe the main academic practices and the key variables that influence decisions. By reducing the 'noise' around differences and focusing on what is pedagogically significant the project hopes to provide institutions with a means to review and improve processes and help system suppliers better support common UK practices. It is hoped that institutions that have already undertaken process review in this space may find opportunities to replace frustrating 'workarounds' with better solutions. The work will be discussed with the EUNIS e-Learning Task Force at its next meeting (June 2015) to identify the extent to which UK academic practices relating to marking and feedback are shared in other parts of Europe.
- Solution area 5 - good practice toolkit is proceeding as a project. The aim of this project is to deliver an interactive online toolkit, based around the assessment and feedback lifecycle, that will provide examples of effective practice at each stage of the lifecycle. The toolkit will be written in an action-oriented way, to enable response and action by the institutions involved and will include resources such as: tools; case studies; shorter vignettes of good practice; policies and processes; information on technologies and integrations. A potential collaboration with SURF in the Netherlands is under discussion and the work will also be discussed with the EUNIS e-Learning Task Force at its next meeting (June 2015) to extend the scope of good practice to be included in the toolkit across the whole of the EUNIS community and to offer opportunities to pilot the resources.
- Further work on the feasibility and scope of solution areas 2 and 4 - feedback hub and interoperability is to be undertaken. In particular, a study will explore the potential development of a Jisc-funded tool that would deliver an aggregated view of feedback and marks, with both tutor and student views. By examining some of the pedagogic, technical and process factors involved in implementing a feedback hub, it will inform the business case and recommend the way forward that would offer most value.
- Solution area 3 - reliable submissions is being tackled by changes to the Turnitin system and further work is on hold pending a review of the outcomes.

The outcomes of the discussions with the EUNIS e-Learning Task Force about extending some of this work Europe-wide will form part of the presentation of this paper at the EUNIS 2015 Congress.

## 8. REFERENCES

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Find out more:

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

Jisc EMA briefing: http://www.jisc.ac.uk/guides/electronic-assessment-management

## 9. 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.

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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.