

MODELING ASSESSMENT PROCESSES ACROSS A UNIVERSITY AND INTRODUCING TECHNOLOGY-BASED INNOVATIONS

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Abstract

The STAF project at Keele University UK is promoting the institutionally wider use of technology in assessing student coursework and providing feedback to students. After reviewing current practices, the assessment process was modeled in thirteen stages. Three improved processes were designed that will enhance the student experience, reduce printing and storage costs, and save the time of faculty members and administrators. Two are wholly electronic while the third, “hybrid” process requires students to submit one electronic plus one paper copy. All electronic submissions take place though the institutional virtual learning environment.

Introduction

Higher education in the UK increasingly emphasizes the experience of students as paying customers (e.g., Browne, 2010). Key features of that experience are the assessment of student work for grading and certification, and feedback on that work, for supporting learning. Assessment is fundamental to pedagogically sound course design (Biggs & Tang, 2007) and feedback is essential for learning (Race, 2010), yet both are the subject of widespread student dissatisfaction. For example, in the *UK National Student Survey*, the questions concerning the student experience of assessment and feedback annually have the lowest scores nationally. The National Union of Students (NUS) has campaigned for improved feedback practices (NUS, 2010). In this context, many UK universities are reviewing their assessment practices, including the use of technologies.

Technology in Assessment and Feedback

A review was conducted of the literature and UK projects involving institution-wide change in assessment and feedback processes, and more specifically those incorporating technology into these processes. The project, Reengineering Assessment Practices (REAP) at the University of Strathclyde, supported an institutional approach to changing assessment and feedback, noting that “In order

to enhance assessment and feedback practice in higher education a single focus or approach will not suffice. A multi-strategy approach is required across the whole institution” (Nicol, 2007, n.p.). The REAP project focused on changing the methods of assessment, using technology to incorporate more formative assessment, and peer and self-assessment. The project, Transforming the Experience of Students Through Assessment (TESTA) (Gibbs, 2010) at three UK universities addresses the pedagogic issues of designing assessment at programme level rather than at (semester) module level, and introducing more formative assessment. Whilst this approach is not an institution-wide approach, it does seek to gain greater consistency across programmes in a range of institutions, and provides a toolkit for achieving this.

Our project Supporting Technology in Assessment and Feedback (STAF) at Keele University emphasizes redesigning the assessment and feedback process, viewed holistically, by designing a framework that allows technology to be easily incorporated into the processes across the institution. Despite being subject to the same institutional regulations, academic schools (i.e., subject departments) and programmes have adopted different processes historically, with different implications for student satisfaction and for the ease of adoption of new technologies.

The benefits of using technology in assessment and feedback are well documented in the literature. For example, the October 2010 issue of *Technology in Learning Journal* discusses the substantial evidence supporting the concept “that technology can support assessment in several ways.” These include “removing the burden of managing assessments freeing up staff to focus on setting effective assessment tasks and giving effective feedback” (Cook & Noss, 2010, p. 10). *Effective Assessment in a Digital Age* (Joint Information Systems Committee, JISC, 2010) provides detailed examples from a national programme of the potential benefits of technology in assessment and feedback.

The STAF project is funded by JISC and a review of many JISC-funded projects was conducted, evaluating their outputs for relevance to the project and institutional objectives and needs. We were able to incorporate the outputs of a number of JISC project outputs (see the project blog, Street, 2010).

Pedagogy

It is widely accepted that improving educational practices must not be driven by technology but by pedagogical priorities: “Effective application of technology requires a clear pedagogical rationale” (Nicol, 2008, p. 5). The current project is conducted in a context where the pedagogical rationale for improving the student experience of assessment and feedback had already been articulated in institutional strategy documents. Keele University has been addressing assessment and feedback improvement for some time, through its Learning and

Teaching Strategy (2006) and Assessment Strategy (2008), and their implementations in the fourteen academic schools. The project explicitly recognizes the following policies as having particular relevance:

- to ensure that assessment is efficient valid, fair, reliable, transparent, and appropriate to students with special needs;
- to provide diverse forms of assessment within all programmes based on clear and consistent assessment criteria;
- to provide students with feedback on assessment that is timely, promotes learning and facilitates improvement in their future performance;
- to ensure that assessment is sufficiently frequent to motivate continuous learning, but not so onerous as to overload either students or staff; and
- to ensure appropriate archiving and records management.

More particularly, the project articulated the institution's current, pressing needs in assessment as the following issues:

- the poor legibility of written feedback to students provided by some faculty members,
- improving the quality and usefulness of feedback to students on their work,
- increasing the awareness by students of the criteria on which their work is being assessed,
- preventing plagiarism,
- increasing the efficiency of processes in the light of a planned worsening of the staff/student ratio, and
- the sustainability agenda — reducing paper usage and printing across the institution.

Thus, although the project's main focus is on improving the efficiency of coursework assessment practices by reducing the use of faculty members' and administrators' time, and other institutional resources, this is taking place in a strongly pedagogically context where the student experience must be protected or enhanced.

The Technologies Involved

The technologies involved in the project are of two sorts:

- The institutional virtual learning environment is Blackboard 8. Together with its integration with TurnitinUK, this is known as the Keele Learning Environment (KLE).
- Rich media to enhance feedback to students, particularly audio files of spoken feedback, screencasts of video with audio commentary (e.g., Jing, Camtasia), and video recordings of tutor feedback.

Keele has a virtual learning environment (learning management system) supporting online assessments. Blackboard 8 provides assignment drop-boxes for student submissions and a mechanism for the return of grades and feedback (as text or other media). At Keele, Blackboard has a link to the TurnitinUK service so that an assignment drop-box can be created where student work can: 1.) generate an originality report that may indicate plagiarism or collusion; and/or 2.) can be marked online with the Grademark tool that supports annotation of the student work in various ways. Keele has an institutional policy requiring at least some use of Turnitin originality reports for every student each year (Bostock, 2011).

Despite this infrastructure and policy context, there are barriers to improvement in assessment practices, including staff workloads in modules with large cohorts, staff work habits, concerns about retaining personal contact with students, outdated equipment, and the variety of needs of different programmes and assessment types. New technologies including audio, video, screen casts, and voice recognition are not widely known. An example of the difficulties of encouraging change in this area has been a recent proposal by students to substitute any handwritten feedback with typed feedback, which has been discussed at length in university committees, faculties and senate.

The STAF project is providing the resources needed to make significant progress across the institution in adopting these technologies. We do not need to develop further technologies, rather, we need to understand and support the affordances of existing technologies, those currently available at Keele and others we can introduce, and how they can be integrated into the whole assessment process.

Project Goals

With the support of senior management we are supporting an institution-wide change in assessment practice but one that acknowledges the different needs of programmes and assessment types. The project outcomes include

- A suite of assessment processes supported by the university, for improving the experience of faculty members and students.
- Within these processes, the development of new assessment and feedback methods based on technologies not widely used, such as voice and handwriting recognition, and audio and video recording.
- Support for academic schools in adopting new processes and technology, through documentation, multimedia training resources, workshops and individual support.
- An evaluation of the faculty members' and students' experiences of the changes.

The facilities of the institutional KLE are strong constraints on the possible processes, for example by supporting well some aspects such as student electronic submission while supporting less well the efficient return of rich media files to individual students. The experiments with rich media technologies 'slot into' steps in the processes (described below).

Review and Analysis of Coursework Assessment

Following interviews with a group of administrators and faculty members in each of the 14 academic schools, an analysis of current practices was analyzed as a process of 13 steps that apply to paper or electronic media. This process does not apply to examinations in examination halls or class tests in lecture halls nor to online objective tests such as multiple choice questions. It will cover the bulk of coursework assignments in most courses: the submission of work (usually texts as Word documents), their reading, grading, feedback and archiving. The context and constraints for this analysis particular to the UK and to this institution include:

- Currently, paper copies are handed by students to a desk in the School Office, with a cover sheet, and an administrator issues a paper receipt.
- The need for second marking of a proportion of scripts, according to university regulations.
- The need for an external examiner to see a selection of scripts and feedback about them to students, and the second marker's report.

- Grades are provisional, even when released to students, until the annual examination board with the external examiner present.
- Once confirmed by the board, confirmed grades are stored in the central student records, from where they are released to students through a Web interface.
- Anonymity of marking student work is required in most cases except for first-year undergraduate work.
- Student work and feedback sheets are currently archived on paper for a number of years according to university policy, but physical space for this is almost exhausted.

Initially the assessment process was modeled graphically, but it is more simply represented as 13 activities that are largely sequential:

1. The teacher sets the task.
2. The teacher supports student's working on task.
3. Student submits work.
4. Student receives receipt.
5. Students' work is collated (with paper submissions this is done by administrators, checking against registers and sorting into order).
6. First marker reads work and produces feedback.
7. First marker produces provisional grade.
8. Feedback returned to student.
9. Provisional grade returned to student.
10. Second marking: Select student work for second marking, second marker marks work, checks feedback and agrees marks; second marker writes report.
11. Students' work is selected for the external examiner to read, with the feedback on it and possible second marker comments and mark on that work.

12. The exam board with the external examiner confirms the final grades, which can then be returned to the students.
13. An archive is made of student work and feedback on it, and plus possibly a copy of feedback is placed in the paper student file in the School Office.

This process involved a number of design decisions. For example, the separation of the return of feedback (8) from the return of a provisional grade (9) is important. Although currently the grade is normally returned with the feedback, there is a growing literature that shows the value of delayed return of grades so that students use the feedback first, possibly returning a reflection upon it (Parkin & Holden, 2010; Wiliam, 2009). The process must allow this as it is likely to be promoted in future.

The discussions with academic schools on their practices and reasons for them uncovered varying interpretations of regulations relating to assessment, so that recommendations for review of four regulations are being made.

Three New Assessment Processes

Three assessment processes were designed, recognising the diverse needs and preferences of different programmes and faculty members. The first and second are paperless, using either a Turnitin assignment drop box to use the Grademark tool or a KLE assignment drop box. Students will typically submit MS Word documents, but other formats are possible. The third process requires one paper copy and an electronic copy of the same work to be submitted. This allows examiners to read the paper copy, while retaining many of the advantages of an electronic submission.

Feedback to students in all cases is on a pro forma basis which includes fields such as how the work was assessed against the criteria, what were the strong and the weak features of the work, and how future work could be improved. Schools each have their own feedback pro formas. For the first two, wholly electronic processes the student inserts an electronic copy of the pro forma onto the start of the Word document, where it will be completed by the marker before the file is returned. Academic schools are provided with a file-store with structured folders for each year and module, for a permanent archive of student work and other documents related to an assessment.

The Grademark Assignment Process

1. The task is set in any way.
2. Support for students could include them submitting a draft electronically to receive feedback generated with the Grademark tool.

3. Each student submits a file to a Turnitin drop-box with Grademark enabled, accessed through a link in Blackboard 8, with the feedback pro forma included at the start of the document. An originality report will typically be generated from the same submission to conform with institutional policy and to deter plagiarism.
4. No receipt is needed as the student can check the work is received, and an e-mail receipt is sent automatically.
5. No collation is needed as student work is sorted automatically.
6. The first marker (examiner) selects each piece of work in turn, reads the work on the screen and annotates it with the Grademark software, adding feedback to the pro forma, and using a variety of other tools including rubrics and drag-and-drop comments from a palette.
7. The first marker produces provisional grades and places them in the KLE grade book from where they are later released to students. (If grades are added to the Grademark page they are inseparable from the feedback but are copied to the grade book automatically.) From the grade book the grades can be exported to the student record system once they are finalised in (12).
8. Feedback is returned via through the KLE link to the Grademark drop-box on the specified release date (no later than three weeks after the submission deadline).
9. Provisional grades are returned to students through the KLE grade book, unless it was embedded in the Grademark document returned in (8).
10. On the basis of the overall calculated module mark, some students' work is selected for second marking, to agree or change the mark, and to check feedback. The second marker's report is stored in the folder for this assessment on the school's network drive,
11. Students' work is selected for the external examiner to read, with its feedback, and the second marker's report. The external examiner accesses the selected students' work, and any others of interest, through the KLE link to Grademark.
12. The exam board with the external examiner confirm final grades. The grades are copied from the KLE grade book into central student records, where they are released to students through a secure Web interface.
13. An electronic archive of the Grademark files (student work + feedback) is made by a batch download into structured folders on a network drive.

The KLE Assessment Process

The second process will not be described in detail as it is similar to the first in many respects. Instead of a Turnitin drop-box it uses a KLE (Blackboard 8) assignment drop-box for submissions of Word documents. These are marked, while either online or offline, completing the feedback pro forma in each one and annotating each with feedback, using various features of Word. The amended file is returned to the student via the KLE assignment. The student work and the returned files remain in the KLE and can be downloaded in bulk for electronic archiving.

What this process lacks is the generation of originality reports in Turnitin, and access to the Grademark tool. However, a positive feature of this process is that rich media feedback (audio, screen cast, video) is possible; this is returned through the KLE assignment, or embedded in the Word document that is returned.

The Hybrid Process

This version involves submission of one paper copy, for reading by markers and external examiners, plus a digital copy to a Turnitin assignment drop-box that creates an originality report but not a Grademark tool (various options are possible). This process will suit some faculty members who wish to read paper rather than electronic text, and will be suitable for longer work such as dissertations.

1. The task is set in any way.
2. Support for students could include drafts submitted and returned either on paper or through a KLE assignment drop-box or a Turnitin drop-box with an originality report.
3. Students submit one paper copy by the deadline plus the same document to a Turnitin originality drop-box (similar to that in the first process), within 24 hours.
4. Receipts are automatically sent through the Turnitin assignment.
5. Collation of the paper copies is necessary by administrators.
6. First marking is done by reading the paper copy. Feedback is on a Word document of a feedback pro forma. Handwriting on a paper pro forma is not an option.
7. The first marker produces a provisional grade, which is entered into the KLE grade book.
8. Feedback is returned electronically through a dummy KLE assignment (to which no submissions are made) within 3 weeks of the submission

deadline. The paper copy is not returned, so that it is available for the second marker and external examiner.

9. Provisional grades are returned from the KLE grade book, at an agreed date, possibly later that feedback being returned.
10. Paper copies are selected for second marking, agreeing or changing a mark. Checking feedback will be done by referring to the electronic feedback sheets accessed through the KLE. The same work is available electronically if preferred. The second marker's report is stored in the folder for this assessment on the network drive.
11. Paper copies are selected for the external examiner to read, and posted to him/her, with feedback pro formas printed from electronic copies. If preferred, the students' work and feedback is also available electronically through the KLE.
12. Final grades are returned to students after confirmation by the external examiner and the exam board. The grades are copied from the KLE grade book into central student records (via a spreadsheet), where they are released to students through a secure Web interface.
13. An archive of the student files in the KLE is made with a batch download into a folder on the network drive. Feedback could also be archived from the KLE, if desired.

These three processes will provide consistent, technology-based coursework assessment. The technologies involved are constantly developing new features that will enable improvements in the processes in future, for example by better supporting second marking.

Encouraging Innovations

Alongside the development of the standardized processes above, innovations in using technology by individual faculty members, especially for enhancing feedback to students, have been supported individually. This can be used in any of the three processes as step 8. Twenty projects have been supported and evaluated across the institution. Examples include

- audio feedback in chemistry courses, recorded on a digital recorder and edited before return to individual students through the KLE;

- screencasting using Jing to provide feedback to students in life sciences that shows their work on-screen with an audio commentary;
- using a Tablet PC with Grademark in life sciences;
- using large, vertical computer screens with Grademark in nursing;
- providing video feedback to students in digital music; and
- piloting electronic archiving in law.

Projects have been evaluated with questionnaires and focus groups, and interviews with the faculty members involved are captured as video clips.

Institution-wide Embedding

The project has had senior management support from the start and the Pro-Vice Chancellor chairs the project steering group. Consultations on the draft recommended processes were made with School and the Faculty Learning and Teaching Committees, and the university assessment review group, before being submitted to University LTC as a policy. Training will continue to be made available through the Learning Development Unit (the institutional teaching centre) to support the processes and technologies described.

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