

An Investigation into E-Tool Use for Formative Assignment Assessment – Status and Recommendations

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ABSTRACT

This article reports on a comprehensive study, investigating the use of e-tools for formative assignment assessment. The study conducted a large-scale literature review and interviews with 90 academics at five New Zealand tertiary institutions. The focus of the study was on formative assessment provided in assignments, an area in which educational theories on importance for learning and on best practice are well established. Yet, research shows that these theories have failed to influence tertiary practice sufficiently to ensure the best possible outcomes for student learning. The interview data collected were analysed according to motivation, needs and benefits as perceived by lecturers and educational principles as derived from the literature. Both the literature and the interview analysis showed a strong positive impact from using e-tools for the management and marking of assignments. Widely available e-learning and general purpose computer tools can be used effectively to support lecturers in dealing with assignments. Specialised assignment tools provide opportunities for even greater gains. The use of e-tools means time savings for the lecturers and enables quality gains in the assignment process. E-tools have the potential to assist with uptake of the well-established educational theories. This article summarises important aspects of the literature review and the interview analysis conducted as part of the study. It provides recommendations in the form of suggestions on which tools are suitable for specific steps in the assignment process and alerts the reader to the website where there are user profiles supported by case studies and an action plan. All these recommendations are targeted at encouraging and enabling lecturers to employ e-tools for the management and marking of assignments.

Keywords

Assignments, Assessment, E-learning tools

Introduction

Formative assessment provided in assignments is of highest value in student learning. Assignments require students to construct and formulate their own thoughts and, depending on discipline, present these thoughts in the form of essays, models, calculations, or reports. Educational theories around the importance of assignments and best practice are well established. The questions that led to the research project reported here were how e-tools can help lecturers use good practice in formative assessment with assignments, to which degree the use of such tools is currently happening, and how further uptake can be encouraged.

To answer these questions, a comprehensive literature review and interviews with 90 lecturers at five New Zealand tertiary institutions were undertaken. General and specialised e-learning tools suitable for supporting aspects around assignment processes were investigated. This article summarises important aspects of the literature review and the interviews. It focuses on recommendations directed towards individual lecturers who are striving for gains in efficiency and quality by suggesting ways of integrating e-tools into their assignment practice. The full findings and details are available at the project website, <http://etools.massey.ac.nz>.

Summary of the literature review

The literature review for the project had two main aims. The first was to establish the characteristics and importance of formative assessment with assignments. The second aim was to identify electronic techniques, tools, and approaches for this type of assessment, to discuss what was known about their effectiveness, and to uncover factors influencing uptake.

For the first aim, key articles and books that have shaped current theory on formative assessment of student work have been identified and analysed. For the second aim, a comprehensive search of e-learning literature from 2001 to

2006 was conducted. A list of about 100 journals and conferences relevant to assessment and e-learning were identified. From these a subset of close to 40 sources was selected, based on journal impact factor, reputation, and relevance to the study. Within these sources over 580 journal editions and conference proceedings were searched.

Assessment with essay-type assignments

Formative assessment with assignments is part of coursework. Coursework implies both a formative component, feedback to facilitate learning, and a summative component, the marks the students receive for their efforts. The importance of this type of assessment lies in the challenges it poses to students to formulate their own thoughts and construct their own answers, linking to higher-level learning outcomes. The authors of educational literature typically use the term “essays” to refer to such coursework. While many disciplines do not use the term “essay,” the challenges and benefits noted apply to a wider body of student work. For example, in business studies one might talk about a report; in the sciences students might describe the planning and analysis of laboratory work; in a software development context students might be required to elicit requirements and formulate models. All this type of work poses the challenges of formulating own thoughts and constructing answers. The next two paragraphs, reporting directly from the literature, use the term “essays.” The later sections of this article refer to “essay-type” assessment to alert to the wider context.

Essay assignment questions provide students with freedom of response and require students to apply their knowledge and skills in organizing, integrating, and evaluating information (Linn & Miller, 2005; Nitko, 2004). Essays target knowledge, understanding, and proficiency in reasoning (Stiggins, 2005). Essays aim at the highest level of learning outcomes by emphasising the integration and application of ideas (Gronlund, 2006). In contrast to multiple-choice examinations, the answering of essay questions prompts students to adopt deep learning approaches (Struyven, Dochy, & Janssens, 2005).

Essay assignments require the students to formulate their own responses. Writing requires thinking and reflection to be able to communicate knowledge in clear, plausible, and effective ways (Tynjala, Mason, & Lonka, 2001). Data and ideas need to be organized and integrated (Linn & Miller, 2005). Writing is integral to the process of learning (Goodfellow & Lea, 2005). It plays an important part in language development and knowledge construction (Lindblom-Ylänne & Pihlajamäki, 2003). With these characteristics, writing plays an important part in achieving higher-level learning outcomes.

E-learning tools

Areas in which e-learning tools and approaches can support essay-type assessment are the management of assignment submission, storage and return, the assistance in providing individualised feedback to students, the coordination of marking teams, and the communication with students (Stephens, Sargent, & Brew, 2001).

Various types of software can be used to support essay-type assessment. Learning management systems provide base-level support, largely for the management of assignments. General purpose tools such as word-processing systems can be adapted for tasks like providing feedback. Specialised assessment software is available. It falls into four major groupings of which only one is relevant to the formative assignment assessment considered here. The first set is specialist software for the specification and automated marking of restricted-response item assessment like multiple-choice tests. These tools are not relevant in the context of this research as they target a different assessment paradigm in which students select from pre-defined answers and the correctness of an answer is pre-determined. While valuable in their own right, these tools are not included as they do not match the “essay-type” nature of assessment considered here.

The second set is specialist software that attempts the automated assessment of free-form student writing. Several articles in the literature report a relatively good reliability of these systems. The main reasons why these systems are not considered further in this research are as follows: the need for very large essay sample sizes to calibrate the automated marking; restrictions in providing meaningful individualised feedback to students; and the limitations of only being able to analyse text-based student work.

The third set of specialist software comprises tools that have been developed for automated feedback in specific domains. For example, certain aspects of computer programs, such as correctness, style, documentation, or efficiency, can be analysed automatically and formative feedback can be generated. This set of tools is not included in this work for two reasons. First, computer programs use strict syntax rules and do not fit the idea of “free-form” as followed in this article. Second, computer programming is a highly specialised area, whereas the work in this research aims at identifying e-learning solutions with wide applicability.

The fourth relevant set of specialist software for assessment is comprised of tools for marking assignments. These tools build on educational assessment theories. They offer support for the management of assignments and, most importantly, provide features conducive to high-quality formative marking (Stevens & Jamieson, 2002; Blayney & Freeman, 2004). The tools integrate scoring rubrics that allow markers to provide feedback at a detailed level and in summary. The general philosophy of these tools is to liberate the marker from mundane but necessary administrative tasks and to create an environment that facilitates quality feedback, enhancing student learning. Examples of these tools are Turnitin and Grademark (<http://www.turnitin.com>), Electronic Feedback Software (<http://www.ljmu.ac.uk/cis/software/feedback.asp>), Questionmark Perception (<http://www.questionmark.com>), WebCTConnect and MarkTool (<http://www-ist.massey.ac.nz/marktool/>), Markin (<http://www.cict.co.uk/software/markin/index.htm>), and Markers Assistant (<http://www.surreal.com.au>).

While the software in this last set shows a lot of promise for essay-type assessment, it is not widely used. Uptake is localised to institutions where researchers have developed these tools and even at these institutions only early adopters are involved (Sim, Holifield, & Brown, 2004). No reliable studies are available that would show numbers of users across the tertiary sector. The developers of the tools report on the use of their tools (Baillie-de Byl, 2004, Denton, 2003; Wells, 2006), but this provides only examples of localised use. The authors of this article have done an informal evaluation of a specialist tool available at their institution, which has indicated a low uptake by only a few percent of instructors. This needs to be seen in light of the low uptake of the assignment tool that is part of the learning management system at this institution, which is the required first step for using the specialist tool (<http://www-ist.massey.ac.nz/marktool/>, see Survey Results).

Stakeholder groups

The main groups of stakeholders concerned with assessment are students, lecturers and institutional support, and management staff. Students in general are concerned with the fairness of assessment and the level of feedback they receive. Students are open to new forms of assessment and to the use of e-learning tools in general. Based on the high stakes involved in assessment, students are not prepared to tolerate any form of malfunction of an assessment system (Campton & Young, 2005; Nesbit & Burton, 2006).

Lecturers live in a complex network of their own, student, and institutional needs. Their considerations regarding uptake of e-tools for assessment are influenced by opinions and experiences of colleagues, familiarity with technology, opportunities for efficiency gains, preparedness in modifying their approaches to teaching and learning, and institutional support. The use of e-tools for assessment can increase the awareness of staff regarding assessment approaches (Aller et al., 2005) and can positively influence the link between assessment and teaching and learning (Buzetto-More & Alade, 2006). A crucial factor in the evaluation of the effectiveness of an e-tool lies in the flexibility of staff. Staff who are willing to adjust their assessment practice can benefit greatly from such an electronic system (Jones, Cranston, Behrens, & Jamieson, 2005). The selection of e-tools for assessment must be guided by the pedagogical design of the assessment. It is up to staff to do the thinking, take control, and match tool use to their assessment approach and learning goals (Freeman & McKenzie, 2002). The primary focus needs to be on pedagogical improvements while productivity gains can only be hoped for in the medium to long term (Warburton, 2006).

Institutional support and management is of critical importance. Institutions must be instrumental in making the appropriate e-tools available, guiding and protecting staff with suitable policies, providing comprehensive training both on instructional and technical levels, and ensuring ongoing support (Buzetto-More & Alade, 2006; Freeman & McKenzie, 2002; Sim, Holifield, & Brown, 2004; Warburton, 2006).

Importance of e-learning technology for assessment

There are a variety of ways in which e-learning can facilitate assessment in general and essay-type assessment in particular. Freeman and McKenzie (2002) advocate the use of web-based systems to improve students' learning of teamwork skills. They state that such systems reduce problems with teamwork, especially in the context of large classes. Stevens and Jamieson (2002) talk about the use of e-tools to improve marking quality and feedback. Blayney and Freeman (2004) list a number of ways in which computing support can help with providing feedback. They talk about supporting human markers in commenting on supply items, about polling student opinions in the classroom, and about getting insight into student understanding through quizzes and tests. Plimmer and Mason (2006) as well as Edwards and colleagues (2002) emphasise the advantages of electronic submission and handling of assignments.

They list issues like the ease in collection of student work, the removal of geographic limitations, the reduced risk of lost work, the time and resource savings if printing is not required, the long-term availability based on the ease of storage of electronic artefacts, and the efficient return of marked student work. A number of authors point out the opportunities for anonymous participation and marking that arise from e-assessment approaches (Davies, 2002; Downton, 2006; Edwards, Fernandez, Milionis, & Williamson, 2002). Student identities can be stored in a database and the artefact that the marker sees can be kept anonymous, which is one of the recommendations for addressing the challenges in the reliability of essay marking (Gronlund, 2006; Lambert & Lines, 2000). Peer environments can be designed in which students can participate anonymously, with only the assessing teacher knowing the students' identity. New assessment designs are possible in which students learn from repositories of marked example assignments (Heinrich, 2004; Heinrich & Lu, 2005). These designs include self- and peer-assessment and scaffolding of student learning by only partially releasing feedback data.

It is essential to use technology for the right pedagogical reasons. The use of technology for its own sake will not improve educational assessment (Committee on the Foundations of Assessment, 2001). The use of technology must be well thought-out, and assessment must be integrated into learning (Blayney & Freeman, 2004). Students should be informed of the reasons for using e-learning systems and the relation of these systems to learning design (Freeman & McKenzie, 2002). New approaches to assessment in higher education can be informed by e-learning technology. These approaches should emphasise the role of technology in supporting the human assessor, whose role is vital, especially for formative assessment (McGuire, 2005). For any form of assessment, validity and reliability are important measures. In an e-learning context new forms of assessment can and should be explored to achieve these measures, and this process for improvement should be driven by all stakeholders involved in education (Wijekumar, Ferguson, & Wagoner, 2006).

In summary it can be said that there is a lot of opportunity for using e-learning technologies and approaches to improve assessment. There is also consensus in the literature that these opportunities are not being taken advantage of and that not enough effort is put into exploring the use of e-learning for assessment processes and tasks (Baillie-de Byl, 2004; Blayney & Freeman, 2004; O'Reilly, 2005; Wells, 2006).

Summary of interviews

The survey comprised interviews with staff who use e-tools to help receive, mark, or return assignments. The sampling strategy was purposive. The selection deliberately looked for staff using e-tools for the marking and management of assignments. The aim was to examine the practice of the leaders in the field so that the value of e-tool use could be assessed and recommendations be formulated on good practice. This study did not attempt to identify how many lecturers use e-tools. The selection process took care to include lecturers who use a diversity of assignments and educational contexts covering a range of class sizes, subjects, and educational levels. Key contacts at each institution selected staff they judged to best fit the sample criteria.

The interviews were semi-structured and guided by the questions about the context of the assessment, the use of e-tools, views on advantages and disadvantages of tool use, and factors determining tool use. Information was collected on demographics such as years of teaching, class size, level of degree, subject (based on New Zealand standard classification of education [Ministry of Education, 2007]), course type (campus or distance), and institution. The participants were predominately experienced lecturers. About half of the sample had taught in tertiary education for more than ten years, 40 percent had taught between three and ten years, while fewer than 10 percent had taught

less than three years. The courses the participants discussed were an even mix of campus-based and distance courses. Forty percent of courses were campus based, 40 percent were distance, and the remaining 20 percent were either both campus-based and distance or the participant discussed both modes using different course examples.

Interview analysis directions

The following main analysis themes and sub-themes were selected:

- Benefits. Administration, reducing geographic limitations, time and resource savings, group facilitation, archives, plagiarism, and other issues
- Motivation of lecturer. Institutional criteria, benefits for students, pedagogy, productivity gains, preventing plagiarism, tools being a necessity or reasons for using a specific tool
- Needs of lecturer. General needs of lecturer, specific needs of the lecturer, technology requirements, and student needs
- Educational aspects of feedback. Clarify goals and criteria, self-assessment, feedback, dialogue, motivation, closing the gap, shaping teaching, validity.

The analysis on educational aspects of feedback was guided by Nicol and Macfarlane-Dick's work on the seven principles of good feedback (2006) and the need for validity of assessment. To guide the analysis of the interview transcripts, the principles were complemented by thoughts on practice, expressing how the more theoretical concepts could manifest themselves in teaching.

The theme-based coding was applied fully to 30 interview transcripts. The majority of the 30 interview transcripts were chosen based on the following four criteria:

- Well-defined need matched by the use of technology. The needs of the students and the course were met by the technological innovation employed. An important point was that there was good use of e-learning tools.
- Good feedback and assessment practice. Evidence that the lecturer was adhering to pedagogical principles or the seven principles of good feedback practice outlined by Nicol and Macfarlane-Dick (2006).
- Evidence of innovation in the area of using e-tools for assessment. For example, did the lecturer create his or her own system to meet the needs of the students?
- Clear interview that added something new. A comparison of interviews on the range of tools and lecturers from different institutions helped the selection process.

In addition, all interviews were analysed based on a list of issues, focusing on the key principles of good assessment, the steps in the assignment process, and the extent of tool use. The issue analysis is not reported here but can be found in the reports on the project website (<http://etools.massey.ac.nz/>).

Selected analysis results

From the rich set of analysis results only a few can be reported here. This section presents some of the results from the analysis on benefits, motivation of lecturer, needs of lecturer, and educational aspects of feedback.

Benefits

In the benefit analysis, the benefit that was referred to most often was e-tools to assist with administration issues. Following this were the major benefits of time and resource saving, facilitating group activity, the removal of geographic limitations, improving the quality of marking and feedback, and having an archive of student work. A practical benefit of using e-learning tools mentioned most often by the lecturers was reducing effort and time they spent on administration.

R46: One of the reasons I really started to do this was because with distance papers I felt a little bit like the Harry Potter movie when the letters [arrived] and [were] flying everywhere and I felt that I had essays coming under the door, I had essays in my mailbox, essays by post, essays on the computer, essays on digital, and it was everywhere and I just thought right submit them digitally and now it's just via the digital

drop box.

Motivation

One of the strong motivational factors for using e-learning tools for assessment was based on good institutional support. A common theme that emerged from the interviews was that lecturers were motivated to use the learning management system the university supported. A number of lecturers suggested they were “forced” or had little choice but to use the system supported by the university, and there were no options for using alternative systems. Another group described this as a form of protection for lecturers as the responsibility did not rest with them. If something went wrong with the system, assistance was readily available.

Needs

A variety of different needs of lecturers arose when discussing feedback and the use of e-tools. These were grouped into five main themes. First, needs that relate to course context, such as class size and availability of tutors, were identified. Second, a need for institutional support emerged. Third, a tool’s ease of use was recognised. The fourth need involved specific technological needs or improvements related to individual tools. Finally, student needs were also identified by the lecturers. The following quote expresses the frustration of a lecturer who is required to spend too much time on administrative tasks and who recognises this as a detriment in assisting student learning.

R36: I think the frustration for me is I would like to be able to give much fuller feedback. I mean one of the big deals for me is that I teach really big courses, so I actually don’t really do a lot of my own marking, and sometimes I feel like I would walk over broken glass to be able to teach two courses with 20 students in them so I could do all my own marking and take my time over it. So I spend a lot of time checking marking and arranging marking rather than marking, and that is so frustrating.

The need for institutional support is clearly recognised in the literature. Essential to the successful adoption of e-tools for assessment is a strong support network and support from the institution (Freeman & McKenzie, 2002). It has been reported that staff often experience a lack of support and disinterest from colleagues when using new e-tools (O’Reilly, 2005). Not only do staff need technical support on how to use a tool and how to mark using the tool, but also the environment around the staff member needs to support use of the tool. A number of reports suggest that the introduction of e-tools for assessment requires a holistic institutional approach (Downton, 2006; Kennedy, Webster, Benson, James, & Bailey, 2002; Kenny, 2002). In agreement with this, a number of lecturers mentioned the need for more support from within an institution about how to use e-tools and for help with problems, as illustrated by the extract below:

R38: I think that they should do some research, provide some guidelines, and provide some suggestions, what packages are out there. When we were looking into Turnitin I went, this should be something that’s funded, there should be a central investigation as to what a good tool is or what some good tools are and then it should either be provided centrally... rather than every single lecturer who’s interested and are struggling along and doing it on their own. Why can’t they put together ways of marking electronically?

Looking at needs related to technology, a number of devices have been identified as having possible uses in the provision of feedback to students. Audio comments and visual feedback were needs identified by a number of lecturers from the interviews as a whole. It was thought that being able to give audio or visual feedback to students could save time in giving feedback and make feedback clearer to students. One lecturer’s views about media-rich feedback are below:

R5: There’s clear opportunity for tools to help in the automation of this, and my feeling is that a more media-interactive or more media-rich feedback with a combination of textual, audio, and some video conferencing or something where I can actually point at things would be really, really nice. If that was so easy that it would be no more different than me spending ten minutes pointing and talking to them, then that would be fabulous because it’s taking me that long to type things in.

Other needs that were mentioned depended on the particular tool that the lecturer used. Some lecturers were interested in tools that could help in the provision of more structured feedback, such as a database of standard comments that could be chosen from while marking. Some highlighted limitations of the tools that were used. For example, some lecturers complained that learning management systems were too clunky to use, or that they were not integrated with the centralised university system, and they wished for improvements in this area.

Addressing the needs of students, one lecturer noted that once a course is finished students should be able to access the archive of their work and feedback that had been given on a learning management system, but at present once the course finishes the student no longer has access. This was identified as a need to support ongoing student learning.

Educational aspects of feedback

Dialogue between students and teachers or their peers has been identified as a key component in providing effective feedback to students (Nicol & Macfarlane-Dick, 2006). A study by Orsmond, Merry, and Reiling (2005) noted that some students would like more opportunity to discuss feedback than they are given. It seems that e-tools may provide more opportunity for dialogue than traditional methods. O'Reilly (2005) noted various aspects of learning designs that become possible and manageable with electronic technologies. In support of this, a large number of lecturers described using online bulletin boards or forums to discuss assignments or questions about a course with the lecturer and other students. This provided students with the opportunity to ask questions of lecturers or tutors and have them answered online. It also gave students the opportunity to engage in discussion about the course or assignments with other students.

Nicol and Macfarlane-Dick (2006) emphasised attempting to close the gap between current and desired performance as a principle of good feedback. Although this was not an issue that was discussed by lecturers at length, some suggested that e-tools provide lecturers with the opportunity to compare past performance with current performance by virtue of the fact that they were able to keep an electronic archive of student's past assignments. Having an archive facilitates accessing a student's previous assignments and feedback that had already been provided to them. Some lecturers also discussed the importance of giving timely feedback so students can take into account the feedback they were given when working on a following assignment, which provides students with the opportunity to close the gap between their current and desired performance. This is a key part of learning and, as Orsmond et al. (2005) reported, a number of students read and reread comments. An example of a lecturer describing providing continuous feedback to students is presented below:

R5: My response is let's have a number of assignments, and I think I had four, it might be five, that start off really simple. They build up over that period and there's no point me giving back another assignment until the next one, unless the previous one is marked on there. So by sizing them and basically having some support to turn them round, you know I want to give them continuous feedback.

Reliability and validity in assessment procedures was another issue discussed by a large number of lecturers. The majority of lecturers discussed some form of keeping marking reliable, such as using marking schedules, or moderating marking before assignments were returned to students. This was particularly the case for larger classes, where tutors or markers were involved in marking. Some lecturers suggested that using e-tools for the moderation of assignments was particularly useful, as illustrated in the example below:

R2: Yeah I think it is easier for moderation purposes because like the same group we have internal classes as well as EDO [Electronic Delivery Option] classes. If electronically submitted then we can moderate each other's work. Otherwise some are Word Documents and some are in hard copy and some are not and then there are problems in moderating also, because you can just send and it's quick and faster and then we need not meet face to face....

Conclusions from interviews

The interviews provided evidence and real-world examples of e-tools being used in the assignment process. Survey participants recognise the benefits of technology in the marking and management of assignments. These range from

increased efficiency to more educationally effective approaches. Participants also identified benefits for the students such as saving time and reducing printing costs by electronically submitting, increased legibility of feedback comments, and the educational advantages of online discussion forums.

The survey identified a range of approaches to assessment. There is a core set of electronic tools such as email, word processors, spreadsheets and learning management systems through which participants are experiencing both efficiency and quality benefits. The extent to which more specialised tools for plagiarism, quality control, moderation, etc. are applied is limited, even amongst this enriched sample.

The decision to use e-tools has more to do with the individual than with faculty, class size, course level, or institution. There are clusters within some faculties where a culture of technology exists, where often an early-adopting or technology-minded person leads the uptake of new technology, sometimes even designing their own system. This eventually trickles down to the other staff members. Lecturers using technology often feel that there is a lack of support from their institution. This highlights the need for a support framework.

Lecturers wishing to integrate e-tools into the assignment process are faced with learning new technologies, acquiring new skills, and slightly altering their current practices. However, the learning curve is not too steep and, in the sample set, once the tools had been adopted, lecturers definitely did not want to revert back to a traditional paper-based approach.

Recommendations

An important goal of the research project underlying this article was to provide good practice for using e-tools for dealing with assignments. To meet this goal, practical recommendations building on the outcomes of literature research and survey were formulated. These recommendations were targeted at individual lecturers, allowing them to make changes in their assessment practices immediately and largely independently of additional institutional support.

Mapping of tools to the stages of the assignment assessment process

The assignment assessment process can be divided into seven stages. These stages are useful for understanding which way particular tools can support the process. The stages stem from the literature on key principles of good assessment (Nicol & MacFarlane-Dick, 2006) and the steps in dealing with assignments. The stages have been used and verified in an analysis of the interviews that examined current practice of the use of e-tools for assignment assessment (Milne, Heinrich & Morrison, 2008).

1. The process starts with supporting students with assignments such as clarifying what good performance is and allowing students to discuss the assignment goals and marking criteria so they understand them.
2. Assignments can be submitted using a variety of electronic tools.
3. The preparation of marking is about getting the assignments and organising them. Many of these tasks can be automatic or semiautomatic.
4. The marking stage is where the lecturers use their professional judgement to prepare feedback. There are a variety of tools to help the lecturer with marking but they all require the expertise of the human marker.
5. Keeping records includes recording and analysing marks and feedback, then transferring marks to other systems such as a central database.
6. Releasing results and feedback is when the lecturer provides the feedback and the marks to the students, facilitates discussion of the feedback, and provides opportunities for the student to incorporate the feedback into their work.
7. Using assignment experience for future teaching is the final phase. This is when the lecturer reflects on the process to provide further teaching for the students or to refine the activity for future student cohorts.

As outlined in the literature review section, the relevant e-tools can be divided into three groups:

- Generic office software and communication tools such as word processors, spreadsheets, and email
- Learning management systems such as Blackboard and Moodle
- Assignment assessment tools designed specifically to support lecturers with the marking and management of assignments.

Table 1 indicates how the tools of the first two groups can be used for the assignment management and marking processes. The specialist assignment assessment tools, which form the third group of tools, provide support at various stages. The following paragraphs indicate how several of these specialist tools link to the stages in the assignment assessment process outlined in Table 1.

Plagiarism-detection software such as Turnitin supports the preparation of marking by highlighting areas of suspected plagiarism. The system can also deal with the submission of assignments (Table 1, stages 2 and 3). Gradermark supports the marking with inline comments and marking rubrics (but can only be used in conjunction with Turnitin, stages 4 and 6).

The electronic feedback software builds on Microsoft Office. It allows the preparation of standard and individualized comments, emails feedback to students, and analyses grade distributions. With these features the software addresses, the stages from marking to using the assignment experience for future teaching (stages 2, 3, 4, 6, and 7).

While Questionmark Perception is used mainly for automated assessment of multiple-choice and matching-type questions. It also has a tool for marking essay-type assignments. This tool is based on a marking rubric and allows comments within the student work as well as overall comments. It supports both marking teams and individual markers. The stages of preparation of marking and marking itself are addressed (stages 3 and 4) and, when used in conjunction with a learning management system, submission and release of results are covered as well (stages 1, 2, 5, and 6).

WebCTConnect works in conjunction with WebCT by extending the functionality of this learning management system. WebCTConnect prepares marking by recognising student groups and supporting marking teams. The marking is guided by marking schemes, and learning from the assignment experience for future teaching is addressed by extraction of all marking comments. WebCTConnect can be used in conjunction with MarkTool, which supports inline marking comments (WebCT: stages 1, 2, 5, and 6; WebCTConnect: stages 3 and 4; MarkTool: stage 4).

Markin starts by importing the student's writing into the program. The marker is then able to mark the text using annotations, comments, and grades. The marked work is exported in a suitable format and sent to the student. When several pieces of work have been marked, one can use the program's comprehensive statistics analyser to collate and compare marks from different students, or from different pieces of work by the same student. The program addresses the stages from marking to using the assignment experience for future teaching (stages 4, 5, 6, and 7).

Table 1. Key stages and issues in assessment processes mapped against basic tool support

The stages of the assignment marking process	Generic office software	Learning management systems
1. Supporting students with assignments	Supports writing of assignment specification. Can email students about assignment.	Facilitates the delivery of assessment activities. Provides a common resource to explain goals and assessment rubrics. Integrates online discussions into course so students can discuss the assignment.
2. Submission of assignments	Supports writing of assignment documents in generic formats. Students can email assignments.	Manages the electronic submission of assignments.
3. Preparation of marking	Lecturer can email assignments to markers.	Allows groups to be set up. Assignments can be assigned to markers.
4. Marking	Feedback and marks can be added to assignments.	Minimal support for document mark-up within the system.
5. Keeping records	Lecturer can keep records using these tools with minimal support.	Extensive support for result aggregation storage. Often able to perform statistical profiling. Can be integrated with other ICT systems.
6. Releasing results and providing feedback	Lecturer can email marked assignments to students.	Supports delivery of results generally through both email and web access.
7. Using assignment	Minimal support for this stage.	Some provide rule-based tools for

experience for future teaching		effectiveness profiling. Rich source of information held in the system.
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Markers Assistant is an application that focuses on the management of the assessment cycle. It facilitates the development of a marking rubric and the distribution of assignments to multiple markers. Once marked, the individual markers' files are merged into a database. During marking, comments can be added to the submitted work. Post-marking moderation aids the quest for improved quality in marking. When results are returned to a student, only the comments that are associated with areas where the student has lost marks are provided to them (stages 3, 4, 5, and 6).

These specialist assignment assessment tools have considerably extended scope compared to generic software and learning management systems. Yet, there are several issues that limit the wider adoption of these tools. Most of the tools named require licence payments and/or are only available locally at the institutions where they have been developed. Besides payment, some level of technical and instructional support will be required by many lecturers to use these tools. Using a specialist tool necessitates an investment in time to learn the features of the tool.

Profiles, case studies, and action plan

The previous paragraphs have looked at the stages of the assignment assessment process and at individual tools. The following paragraphs provide a different angle towards encouraging uptake of e-tool support. The idea is to build on the motivation, needs, and benefits as seen by the lecturers interviewed and to provide themes that individuals should be able to identify with. This leads to the formulation of three profiles that set out a pathway from relatively simple tool use to more sophisticated applications. Profile 1 focuses on efficiency improvements with the idea of freeing up time currently wasted on mundane administrative tasks. Profile 2 shifts towards quality improvements by suggesting how to use tools to contribute to better assignment assessment outcomes. These two first profiles only require the use of standard tools and features of widely available learning management systems. This ensures that individual lecturers should be able to get started without the need for additional licences, institutional support, and a steep learning curve. Profile 3 addresses the lecturer who is prepared to move beyond standard towards specialist tools and is ready to look at extensions of standard assignment assessment designs. Appendix 1 describes profile 3.

To complement the profiles, case studies and an action plan have been devised. The case studies describe typical teaching and assessment situations. Each case study depicts a scenario and discusses specific challenges and how to address these with the help of e-tools. The case studies have been derived from interview responses and are aligned with the profiles. An example of a case study relating to profile 3 is provided in Appendix 2. The action plan provides lecturers with a time-sorted checklist with the steps to take and when to take them. For example, assessment requirements, which concern students, have to be announced early on, sometimes even before the students enrol in a course. For electronic assignment submission, web access is needed, so this might be an enrolment consideration for students. Table 2 shows one section of the action plan. The full profile information, the case studies, and the full action plan are available from the project website (<http://etools.massey.ac.nz>).

Table 2. Section of the action plan for the step “marking of assignments”

Tasks for step “marking of assignments”	Activities to commence
Release of sample solution	You might want to release a sample solution to the class.
Preparing access to the assignments	If assignments are arriving by email, you will have stored them already in one dedicated place. If you use the assignment tool of your LMS, you will need to download the assignments. If you work with markers, you need to assign assignments to markers.
Marking	You use the tools and mechanisms selected for providing feedback. If working with markers, you conduct your steps of monitoring markers and ensuring marking quality. If you mark by yourself, you should guard against marker drift by revisiting assignments marked early on.

Overall evaluation	Looking across all assignments, you can identify general strength and weaknesses and prepare material for further teaching accordingly. You might want to calculate some simple statistics for the assignments or look at the statistics the LMS has prepared for you.
Storing of marks	You need to store all the marks for future reference and for import into your institution's result processing system. Depending on the tools you have chosen, you might be able to simply export the marks in the required format.

Conclusion

This article has investigated assignment assessment that focuses on essay-type student work. The important characteristics of this type of student work are that students have to formulate their own thoughts and that the input of a human marker is required to understand this work and provide meaningful feedback, enabling student learning. The literature paints a clear picture of the importance of essay-type student work and the value of formative feedback for supporting learning.

A range of e-tools is available to support essay-type assignment assessment. Specialist tools exist that show high potential for effective support. The issue with these tools is that they are not widely accessible to individual lecturers and that they require a degree of institutional support. Together with the learning curve involved in mastering these tools, these are the reasons for a fairly low uptake despite the potential. Yet, even with tools that are part of widely available learning management systems and with general purpose tools like word processing and email, essay-type assignment assessment can be supported reasonably well. This arises from the literature and has been confirmed in interviews with lecturers across New Zealand tertiary education institutions. These lecturers, selected for their innovative use of e-tools, have described their use of e-tools in support of assignment assessment and have reflected on their marking and feedback practices. While these lecturers remember the challenges involved in the uptake of e-tools, they give the clear message that they do not want to revert to practices without e-tool use.

To facilitate the uptake of e-tools for assignment assessment, recommendations have been formulated. These recommendations address individual lecturers and show how these can use e-tools to support their existing assignment practices and work on improving their practices in keeping with educational theories. The recommendations take into consideration the fact that lecturers are pressured for time and do not necessarily have effective institutional support structures behind them. The recommendations target time savings that, in the next step of e-tool uptake, can contribute to improvements in quality. The initial steps only require access to widely available tools, lowering barriers to uptake based on institutional dependencies. It is hoped that these practical recommendations, which are based on solid academic research, will encourage many lecturers to increase their use of e-tools in assignment assessment, will contribute to an improvement in marking and feedback quality, and will ultimately lead to better student learning.

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References

- Aller, B. M., Kline, A. A., Tsang, E., Aravamuthan, R., Rasmusson, A. C., & Phillips, C. (2005). WeBAL: A web-based assessment library to enhance teaching and learning in engineering. *IEEE Transactions on Education*, 48(4), 764–771.
- Baillie-de Byl, P. (2004). An online assistant for remote, distributed critiquing of electronically submitted assessment. *Journal of Educational Technology & Society*, 7(1), 29–41

- Blayney, P., & Freeman, M. (2004). Automated formative feedback and summative assessment using individualised spreadsheet assignments. *Australasian Journal of Educational Technology*, 20(2), 209–231.
- Buzzetto-More, N. A., & Alade, A. J. (2006). Best practices in e-assessment. *Journal of Information Technology Education*, 5, 251–269.
- Campton, P., & Young, J. (2005). Please sir, may I have some more? A comparative study on student satisfaction with assessment feedback methods in an undergraduate unit. Paper presented at the Balance, Fidelity, Mobility: Maintaining the Momentum? The 22nd annual conference of the Australasian Society for computers in learning in tertiary education (ascilite), Brisbane, Australia.
- Committee on the Foundations of Assessment. (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Academy Press.
- Davies, P. (2002). Using student reflective self-assessment for awarding degree classifications. *Innovations in Education and Teaching International*, 39(4), 307–319.
- Denton, P. (2003). *Evaluation of the 'electronic feedback' marking assistant and analysis of a novel collusion detection facility*. Paper presented at the 7th International Computer Assisted Assessment Conference, Loughborough, UK.
- Downton, A. (2006). *Online coursework submission from pilot to university-wide implementation: Rationale, challenges and further development*. Paper presented at the 10th International Computer Assisted Assessment Conference, Loughborough, UK.
- Edwards, K. I., Fernandez, E., Milionis, T. M., & Williamson, D. M. (2002). EAST: Developing an electronic assessment and storage tool. *Assessment & Evaluation in Higher Education*, 27(1), 95–104.
- Freeman, M., & McKenzie, J. (2002). SPARK, a confidential web-based template for self and peer assessment of student teamwork: Benefits of evaluating across different subjects. *British Journal of Educational Technology*, 33(5), 551–569.
- Goodfellow, R., & Lea, M. (2005). Supporting writing for assessment in online learning. *Assessment & Evaluation in Higher Education*, 30(3), 261–271.
- Gronlund, N. E. (2006). *Assessment of student achievement*. Boston, MA: Pearson.
- Heinrich, E. (2004). Electronic repositories of marked student work. *Journal of Educational Technology & Society*, 7(3), 82–96.
- Heinrich, E., & Lu, J. Y. (2005). *Opportunities in learning from market student work*. ED-Media 2005 World Conference on Educational Multimedia, Hypermedia & Telecommunications, 4470–4475.
- Jones, D., Cranston, M., Behrens, S., & Jamieson, K. (2005). *What makes ICT implementation successful: A case study of online assignment submission*. Paper presented at the Open Learning and Distance Learning Association of Australasia (ODLAA), University of South Australia.
- Kennedy, D. M., Webster, L., Benson, R., James, D., & Bailey, N. (2002). My.monash: Supporting students and staff in teaching, learning and administration. *Australian Journal of Educational Technology*, 18(1), 24–39.
- Kenny, J. (2002). Managing innovation in educational institutions. *Australian Journal of Educational Technology*, 18(3), 359–376.
- Lambert, D., & Lines, D. (2000). *Understanding assessment: Purposes, perceptions, practice*. Padstow, UK: TJ International.
- Lindblom-Ylanne, S., & Pihlajamaki, H. (2003). Can a collaborative network environment enhance essay-writing processes? *British Journal of Educational Technology*, 34(1), 17–30.
- Linn, R. L., & Miller, M. D. (2005). *Measurement and Assessment in Teaching*. Columbus: Prentice Hall.
- McGuire, L. (2005). Assessment using new technology. *Innovations in Education and Teaching International*, 42(3), 265–276.
- Milne, J., Heinrich, E., & Morrison, D. (2008). An investigation into e-tool use for assignment assessment in higher education in New Zealand. *Australasian Journal of Educational Technology*, 24(5), 487–504.
- Ministry of Education (2007). *New Zealand standard classification of education (NZSCED)*. Retrieved 13 February 2007, from <http://www.minedu.govt.nz/index.cfm?layout=document&documentid=4418&data=1>
- Nesbit, P., & Burton, S. (2006). Student justice perceptions following assignment feedback. *Assessment & Evaluation in Higher Education*, 31(6), 655–670.
- Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31(2), 199–218.
- Nitko, A. J. (2004). *Educational assessment of students*. Upper Saddle River, N.J: Merrill.
- O'Reilly, M. (2005). *Hallmarks of excellence in online assessment*. Paper presented at the First International Conference on Enhancing Teaching and Learning Through Assessment, Hong Kong Polytechnic University.

- Orsmond, P., Merry, S., & Reiling, K. (2005). Biology students' utilization of tutor's formative feedback: A qualitative interview study. *Assessment & Evaluation in Higher Education*, 30(4), 369–386.
- Plimmer, B., & Mason, P. (2006). A pen-based paperless environment for annotating and marking student assignments. Paper presented at the Seventh Australasian User Interface Conference (AUIC2006), Hobart, Australia.
- Sim, G., Holifield, P., & Brown, M. (2004). Implementation of computer-assisted Assessment: Lessons from the literature. *ALT-J*, 12(3), 215–229.
- Stephens, D., Sargent, G., & Brew, I. (2001). *Comparison of assessed work marking software: Implications for the ideal integrated marking tool (IMT)*. Paper presented at the 5th International Computer Assisted Assessment Conference, Loughborough, UK.
- Stevens, K., & Jamieson, R. (2002). The introduction and assessment of three teaching tools (WebCT, Mindtrail, EVE) into a post-graduate course. *Journal of Information Technology Education*, 1(4), 233–252.
- Stiggins, R. J. (2005). *Student-involved assessment for learning* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Struyven, K., Dochy, F., & Janssens, S. (2005). Students' perceptions about evaluation and assessment in higher education: A review. *Assessment & Evaluation in Higher Education*, 30(4), 325–341.
- Tynjala, P., Mason, L., & Lonka, K. (2001). Writing as a learning tool: An introduction. In L. M. Paivi Tynjala, Kirsti Lonka (Ed.), *Writing as a Learning Tool: Integrating Theory and Practice* (Vol. 7, pp. 7–22). Boston, MA: Kluwer Academic Publishers.
- Warburton, B. (2006). *Quick win or slow burn? Modelling UK HE CAA uptake*. Paper presented at the 10th International Computer Assisted Assessment Conference, Loughborough, U.K.
- Wells, J. (2006). Markers Assistant: A software solution for the management of the assessment process. *International Journal on E-Learning*, 5(3), 439–458.
- Wijekumar, K., Ferguson, L., & Wagoner, D. (2006). Problems with assessment validity and reliability in web-based distance learning environments and solutions. *Journal of Educational Multimedia and Hypermedia*, 15(2), 199–215.

Appendix 1. Description of profile 3

Profile 3. Moving beyond standard tool use/extending assessment design: Stepping outside the conventional

The first two profiles describe the use of standard tools for a standard assignment process. The third profile will be of interest to you if you are prepared to step outside the conventional. This can be to explore specialist assignment tools or to continue with the standard tools but use them in more imaginative ways. Your motivation might be to provide further educational benefits, to gain efficiency, or to target both. As specialist assignment marking tools have been designed with marking problems in mind, a gain in both areas is possible.

Using non-standard tools will mean that you will have to gain access to these tools and be willing to experiment. These tools are not difficult to use but, as for any new tool, you will have to put some effort into exploration. It might pay to work on a smaller pilot first until you have gained confidence. Some of the tools will only affect you as the marker, and not the students. This will make it easier for you to experiment, because you won't risk adverse reactions from the students.

You may have already thought about more involved assessment designs and quality control of the marking process, but might have hesitated because of the additional effort required. The use of standard tools beyond the conventional can help you to address these issues.

Most of the approaches discussed in this profile permeate all the stages of the assignment process outlined in Table 1. This section has therefore been structured by themes and not by stages.

Group assignments

Lecturers use group assignments for pedagogical or practical reasons. The questions that typically arise with group submissions are: Does only one group member submit the assignment on behalf of the group or does everyone submit? Are all submitted copies of one group identical? How do I ensure that all group members receive feedback? How do I make sure that I record marks for each group member? For large classes, these questions result in considerable administrative overheads.

Some of the specialist tools address these issues. They facilitate the grouping of students by either explicit definition of groups or by automated detection of group membership based on the assignment submitted. During marking, the tools associate feedback and marks with all group members, while giving you the option of providing the same or different marks to individuals. All group members will receive marking results automatically.

Working with markers

Working with markers poses challenges in administrative overhead and consistency control. Some of the specialist tools help you with these challenges. The tools facilitate the sharing of marking rubrics. They allow you to assign markers to assignments, for example through an initial random distribution which can be adjusted manually should the need arise. The marking of all the individual markers is integrated by the tools into one overview. This allows you to easily monitor progress and to implement schemes of consistency checking. As marking with electronic tools retains copies of all marked assignments you will have a record of who marked which assignments and of all marking comments. This is very helpful when students ask you for clarification, as you immediately have access to the marker's comments. Combining all markers' feedback and marks, in total and per marking rubric, into one environment assists with the analysis of the overall class performance. This in turn helps in your teaching preparation for current and future classes.

Plagiarism

Unfortunately plagiarism can be a major issue, with students copying work among each other and from external sources. Plagiarism detection tools help you to spot potential plagiarism. The tools compare student work on a class level and against ever increasing repositories of previous student work and publicly available material. Some of the plagiarism detection tools are combined with marking tools, addressing questions of marking rubrics, feedback and bookkeeping. You can also use a combination of tools, a specialist tool for plagiarism detection followed by the marking tool of your choice.

Focus on the formative process

One common concern regarding assignment marking is that students do not pay attention to the feedback provided to

them and therefore the formative effect is lost. To combat this problem, one can extend the standard assignment process of submission and return to encourage involvement with the feedback. This can mean returning marked assignments with only formative feedback initially, with marks either delayed or provided only after a student responds to the feedback. Some lecturers allow resubmission of assignments in response to formative feedback. Peer-assessment processes can encourage students to engage with the assignment topics on a deeper level.

While some of the specialist tools support such processes directly, you can already achieve a lot using standard tools like LMS. For example, you could set up a two-part assignment, where the first submission serves largely formative purposes and the second serves as the revised version. In a similar fashion, the first submission could tackle a standard assignment, while the second submission could focus on students' assessment of the work of their peers. Using a standard LMS you would have to perform the intermittent step of making confidential assignment submissions available to the whole class, for example via the LMS content modules. Such processes could be complemented by the use of the LMS communication tools. In selecting which tools to apply and how to combine their use it is important to consider their individual strengths, such as confidentiality provided by an assignment tool, open access at the class level for a content module, or shared contributions in a discussion environment.

Ways of providing comments

What has been discussed in the previous profiles is to provide written comments either by writing directly on the student's work or by attaching separate marking sheets. Some specialist marking tools add to this by allowing the marker to link their comments to the categories of the marking rubric. The advantage for the student is that the marking comments are related both directly to the context in the student's work and to the marking criteria. Some tools offer special pre- or marker-defined symbols for spelling or grammatical mistakes, for example. Another way in which some tools assist the marker is by providing various graphical highlights to clearly identify the reference point in the student's work.

Audio comments can be an alternative to written feedback. Through standard word-processing software, audio comments can be inserted much like written comments at specific reference points in the student's work. This might be an alternative for markers who have problems with typing a large number of comments, for situations where audio comments suit the subject area, or simply to create student interest in the feedback by diverting from the norm of written feedback.

Further efficiency gains

Assignment submission and management with standard LMS tools is already more efficient than email and paper submission. Still, specialist tools provide further advantages. For the submission of multiple files, students are often asked to combine these files into a single compressed file. While standard LMS can accept such files, they do not automatically uncompress back to multiple files. This means manual and repetitive work for the marker who is not supported by a specialist tool that can perform these tasks automatically.

It is helpful to record the marking status of an assignment as part of the marking process. In the context of quality assurance it can be required to revisit an assignment marked earlier on or to review marking done by markers. Some specialist tools allow the marker to capture such meta-information within the marking environment. This integrated approach increases the efficiency and in turn makes it more likely that quality assurance steps are actually undertaken.

Further quality gains

Opportunities for quality gains in terms of coordinating and monitoring the work of markers and keeping information of the marking status of assignments have already been mentioned. What can be added here is the use of standard LMS features to involve students in the development of the assignment task specification and the marking rubric. Students can use discussion tools to exchange ideas and comments. The lecturer can use the content modules of the LMS to make draft documents available to students, for example after a class discussion on assignment goals and student work towards a possible marking rubric.

Appendix 2. Case study relating to profile 3: Providing audio comments

Introduction

I am a communications lecturer teaching generic communications courses across a range of subjects. My students come from wide variety of backgrounds, some being technically oriented whilst others being artistic. I also have a number of students for whom English is a second language. This variety of styles and cultures gives me many challenges when I'm providing constructive feedback.

The need to change

I started using audio feedback for students years ago, using a simple cassette tape recorder. I was motivated to use audio because I felt so limited by the lack of space for adding comments to assignments and also the time it took to provide written feedback. In communications it's common for each assignment to go through a number of iterations, drafts, I guess you could call them, with each reviewed and commented on. Trying to explain the real issues using text-based feedback often took a lot of effort because I had to make sure the emphasis of the comment was unambiguous and constructive. I find using audio feedback much faster and more flexible as it allows me to provide the sort of dynamic feedback that helps my students.

Marking using audio feedback

My colleagues and I use audio formative feedback for all our students regardless of discipline. So the technical trade students get it as do the business students. Typically I give 10 minutes audio feedback per assignment and this lets me give much richer feedback than I could when I was limited to text only. I'm able to offer them alternate ways of expressing a point and demonstrate how a particular statement could be ambiguous and how small changes can make a big difference. I also find, and the students tell me they do too, that audio feedback feels a lot less formal, a more conversational way of communicating feedback. Although I haven't done any formal evaluation, anecdotally I do think I get fewer complaints or queries over the feedback I give and I am convinced that I spend much less time marking.

The process

When I mark an assignment I start by saying the student name and description of the assignment. Depending on the tool I'm using, I either pre-save the audio file named with the student identification and date or name it when I'm finished. That's because some standalone recorders don't allow you to name the file at the outset. I then read through the assignment and when I get to a place that I want to comment on I start the recorder and add the comment. To help the student know what part of their work I am commenting on, I use one of the following aids. If the section is easily identifiable (e.g., close to a paragraph heading) I just quote the part of the text I'm going to comment on and then add my comments. More frequently I mark the script with a number or a letter and then refer to that in my commentary. Once the audio is complete I save it and then either email it to the student with a marked-up version of their work or burn it onto a CD and mail it to them. Mostly I use the mp3 format. I have heard that you can add audio comments to Word documents but I haven't tried that myself. Worth a look though.

The technology

I've tried quite a few technologies for recording feedback and most work just fine. Even the cassette tape worked but the tapes were quite expensive. Thanks to the popularity of the mp3 format you can get all sorts of tools, many for free. I've used Garage Band on my Apple laptop and one of my colleagues uses Audacity on his PC. Audacity is a free recording application that is also really easy to use. You need a microphone, of course, and I find a headset really useful, especially in a shared office. I have also used standalone audio recorders, modern dictation machines like the Olympus DS. There seems to be a solution for most budgets.

Challenges with using audio feedback

Because the audio feedback I use is separate from the original document I do need to be careful about the labeling of the audio files. When I first started, I did find that I needed to practice getting an appropriate narrative style but that doesn't take long to master. I use two methods depending on which one suits the situation. Sometimes I read the assignment right through first and make hand written notes but that method has its drawbacks. Not only does it take more time, there is a tendency to read your notes and this removes a lot of the richness you get from doing it live! I think it helps if you are a confident and clear speaker, not too many "you knows" or "umms" but I think that's something that develops as you get more practice. In fact it can actually help you improve your own communication skills!

One technical challenge of using audio feedback is the size of the file that is generated. Using the mp3 file format the file size is often about 1 MB per minute of recording, although this can be reduced by changing the export file's settings. In Garage Band, exporting an audio file as a mono podcast will give about 250 KB/minute. If you want to know more I suggest you do a web search on "reducing audio file size" or similar key words because there is a lot of advice available.

Evaluation

When we work with a class for the first time, we do have an evaluation questionnaire we ask the students to fill in. Audio feedback doesn't suit everyone, but in the 2 or 3 cases where students have really objected, we provide them with written feedback. In the end-of-course evaluation, our department has added a section that deals with just the audio feedback and how it can be improved. That way we can keep track of the shifts in the way our students use technology and we can adapt what we do.

Summary

By using audio feedback I believe I can provide much richer and more useful comments and suggestions for my students. I am certain that if you were to compare like with like, audio feedback takes much less time than written feedback. It is important that you adopt a style that works for both you and your students and I do modify my style for each student group. The cost is minimal for both consumables and the equipment itself so that hasn't been a barrier for us. With the number of iPods and phone mp3 players around now, students have told me that audio feedback is making their learning experience much more flexible too.