Providing Learner-centered Feedback Using a Variety of Technologies

Jane Costello and Daph Crane

Memorial University of Newfoundland

jcostello@mun.ca and daphne@mun.ca

Presented at the **International Conference on the Liberal Arts**

September 30th – October 1st, 2010 at St. Thomas University, Fredericton, New Brunswick.

Abstract:

As the number, type and use of technologies to support learning increases so do the opportunities for using these technologies for feedback in liberal arts higher education. Literature on electronic feedback (e-feedback) technologies varies depending on the type. The paper looks at feedback, technologies and their affordances which would allow instructors and designers to make informed decisions about when and how to use them for learner-centered feedback. Guidelines for feedback are also presented.

Keywords: feedback, higher education, learner-centered, technology

Biographies:

Daph Crane is a senior instructional designer (SID) with Distance Education and Learning Technologies at Memorial University of Newfoundland. As a SID Daph leads a team to assist faculty in the design, development and implement their online courses. Daph also works on special projects such as Africa Capacity Enhancement Program in Open and Distance E-Learning, and the implementation of mobile learning at Memorial. Daph has a B.Sc. From Memorial University, and a Master of Distance Education, Athabasca University. She is a doctoral student in distance education at Athabasca University, and is focusing on mobile learning.

Jane Costello is a senior instructional designer (SID) with Distance Education and Learning Technologies at Memorial University of Newfoundland where she is primarily responsible for overseeing the instructional design of online courses which are developed in collaboration with content authors and a team of instructional design, multimedia, copyright and library specialists. Other recent projects include learning object repository, blog use, electronic feedback, and an online game – increasing curiosity about careers in science and technology. Jane is a PhD Student (E-research in Technology Enhanced Learning) at Lancaster University focusing on use of Web 2.0 technologies in online learning.

Providing Learner-centered Feedback Using a Variety of Technologies

Introduction

> Nothing that we do to, or for, our students is more important than our assessment of their work and the feedback we give them on it. The results of our assessment influence our students for the rest of their lives and careers—fine if we get it right, but unthinkable if we get it wrong (Race, Brown & Smith, 2005, p. xi).

Feedback is essential in learning. Learners need to know what they do well, where and how they can improve, and any misconceptions they may have. Feedback is provided to learners through comments or grades on formal assessments, body language, facial expressions, tone, and comments made during the learning process. Feedback and assessment go hand-in-hand. It is the feedback on assessment that will be the focus in this paper. The United Kingdom's Joint Information Systems Committee (JISC) 2010 report: *"Effective Assessment in a Digital Age"* defines feedback as: "Qualitative information about their performance given to learners after an assessment" (HEFCE, p. 56). This definition suggests that feedback is more than a number or letter grade, which many would refer to as results. Feedback is the substance, comments and suggestions, given to learners relating to their assessment events. This paper aims to introduce readers to e-feedback for learner-centeredness. It is a starting point when considering choice of technology for risk-free environment of electronic learning and assessment. E-feedback technologies are not discipline-specific. They are context-dependent and many technologies will work in numerous liberal arts courses.

If Boud is correct in that "assessment methods and requirements probably have a greater influence on how and what students learn than any other single factor" (1988, p. 35) and higher education (HE) is moving steadily towards an increasingly technology-rich environment, then it behooves educators to understand how these technologies are being used in e-assessment. A benefit to using technology for feedback is that it can collapse space and time (Farmer, 2005).

Learners and instructors perceive that they are closer; that there is no distance between them. Technology can also provide immediate feedback, which learners greatly value, and is important for the learning process. This is a strong motivator for learners.

Learner-centeredness involves learners being consulted in determining the topics and issues explored and assessed in a course. "The purposes and processes of assessment shift from only assigning grades to include providing constructive feedback to assist student improvement. Learner-centered teaching integrates assessment with feedback as part of the learning process" (Blumberg, 2009, p. 18). Learners take an active role in their learning experience.

Learner-centered feedback provides learners with guidance in evaluating their learning while supporting their learning commitments (Schmitt, Huc, & Bachrach, 2010). In a learner-centered course the instructors' philosophy will incorporate a strong focus on learner decision input and needs. Instructors mediate, with various tools, learning experiences by coaching learners to help them improve and facilitating learner autonomy of learning and assessment (Schmitt et. al, 2010). The learning experience is relevant and motivating to learners and inspiring for instructors.

When moving towards a learner-centered approach the philosophy of the course will be adjusted to put more focus on the learner. Rowntree (1994) suggests becoming aware of learner's prior knowledge; identify 'master' performers knowledge, skills and attitudes; be cognizant of areas previous learners experienced difficulties; carefully consider appropriate learning activities; consider appropriate assessment; consult and compare equivalent course results; and determine the goals and learning objectives. Learner-centered students exhibit characteristics of: (a) understanding reason for learning content; (b) self-awareness of learning abilities and

knowledge acquisition; (c) problems solving; (d) retrieving and evaluating learning situations; and (e) communicating their knowledge in real-world contexts (Blumberg, 2009).

Blumberg (2009) discusses advantages and criticisms of learner-centered assessment. Advantages include: (a) students prepared to solve real-world problems; (b) skills and motivation for lifelong learning; and (c) stronger academic achievement. Criticisms levied include: (a) less material being covered; (b) increased negative attitudes towards and attrition in science in technology courses; and (c) challenges in meeting accreditation standards.

As new technologies emerge, the affordances relating to assessment and feedback are discovered. Rogers, Cheng and Hu (2007) note that history influences current perspectives and evaluation choices; those who value standardized testing see less value in alternative assessment while those who value classroom assessment are more open to alternative assessment. (p. 41). Understanding how emerging technologies may be used in e-feedback combats this refined thinking and opens assessment possibilities.

Feedback

Simonson, Smaldino, Albright and Zvacek (2006) state that a fluid course:

> should provide regular feedback to students. If you do not receive feedback, then you should contact your instructor and ask for information about your progress. If the instructor cannot or will not provide feedback, this is a very bad sign, and you might want to consider enrolling in a different course (p.174).

Feedback, assessment, e-assessment, and e-feedback are related but distinct terms. Feedback is the information given to learners following an assessment. Students need to know how they are doing in their learning journey. They need not only grades but also descriptions of what they have done well, where they have gone wrong and suggestions on how to improve. Feedback is essential for learner growth Mohr (2010).Quality feedback should be provided to all learners regardless of the mode of delivery.

> Effective assessment and feedback can be defined as practice that equips learners to study and perform to their best advantage in the complex disciplinary fields of their choice, and to progress with confidence and skill as lifelong learners, without adding to the assessment burden on academic staff (HEFCE, 2010, p. 8).

Like any form of communication, feedback requires interaction between a sender and a receiver. Cantor advises that the learner and instructor can take on both roles at different times (2008). "Feedback should flow both from you, the instructor, to the learner and from the learner to you. In this way, all participants in the learning activity are given an opportunity to confirm progress, discuss concerns, and have input into the process" (Cantor, p. 45). Feedback is not just the comments on a written assignment, or the grade on a test, but also includes the class discussions, questions, and many of the interactions within the class group. E-feedback expedites learner-instructor communication (Denton, Madden, Roberts & Rowe, 2008).

Boud and associates (2010) state:

> Assessment is a central feature of teaching and the curriculum. It powerfully frames how students learn and what students achieve. It is one of the most significant influences on students' experience of higher education and all that they gain from it. The reason for an explicit focus on improving assessment practice is the huge impact it has on the quality of learning (p.1).

Ridgeway, McCusker and Pead (2004) define assessment as "the process of collecting information about a student to aid in making an evaluation about the progress of a student." (p. 42). The interpretation of these results relative to outcomes or performance is evaluation. McConnell (2006) sees assessment as being "central to students' orientation to learning." (p. 123). Learners need to know what they did well, what they did not do well, where they went wrong and why. It involves "identifying appropriate standards and criteria and making judgements about quality" (Boud, 2000, p. 151).

Kellough and Kellough (1999) identified seven purposes of assessment: (a) improve learner learning; (b) identify learners' strengths and weaknesses; (c) review, assess, and improve the effectiveness of different teaching strategies; (d) review, assess, and improve the effectiveness of curricular programs; (e) improve teaching effectiveness; (f) provide useful administrative data that will expedite decision making; and (g) to communicate with stakeholders. This is true of feedback as well.

There are several types of assessment such as summative, formative, continuous, self, product, process, and diagnostic. Summative assessment builds on continuous assessment (Bull & McKenna, 2004; O'Reilly & Morgan, 1999; Sclater, Conole, Warburton & Harvey, 2007; Sclater & Howie, 2003). Continuous (formative) assessment is used throughout a course (Bull & McKenna, 2004; O'Reilly & Morgan, 1999; Sclater, Conole, Warburton & Harvey, 2007; Sclater & Howie, 2003). Self-Assessment is authenticated or anonymous (Sclater, Conole, Warburton & Harvey, 2007; Scater & Howie, 2003); often associated with reflection. Product assessment is the "assessment of essays, worked calculations, multiple-choice tests, project reports, drawings, constructions – where there is a physical **product** to assess"; while performance assessment is the "assessment of an activity or **process** that may or may not result in any physical product" (Rowntree, 1994, p. 153). Diagnostic assessment is used by instructors to determine learners' prior knowledge (Bull & McKenna, 2004; O'Reilly & Morgan, 1999; Sclater, Conole, Warburton & Harvey, 2007; Sclater & Howie 2003).

The use of information and communications technologies (ICT) distinguishes assessment from e-assessment which Ridgeway, McCusker and Pead (2004) describe as the "processes involving the implementation of ICT for the recording, transmission, presentation and processing

of assessment material" (p. 41) "E-assessment is flexible and supports the assessment of higher order thinking, social skills, and group work" (Buzzetto-More & Alade, 2006, p. 256).

E-feedback can be defined as information provided to learners about their work using electronic communications and technologies. When providing e-feedback it is important to consider that learners may not have full context including meta-verbals and overall context of how the class performed. Learners do not always seek clarity on feedback comments they do not understand which presents challenges for instructors. E-feedback encompasses the process of using technologies and tools such as typed comments, stylus scribing, audio, video, portfolio, blogs, wikis, journals, quizzes, discussion forums, to name a few.

ICT and e-learning strategies facilitate effective learning assessment employing alternative, authentic, and traditional methods (Bennett, 2002). It is important to take sufficient time to plan and execute assessment and quality, meaningful feedback. Assessment and feedback, while both important, do impact workloads. Technology can aid in this process.

> Assessment lies at the heart of the learning experience: how learners are assessed shapes their understanding of the curriculum and determines their ability to progress. At the same time, assessment and feedback form a significant part of a practitioners' workloads… (HEFCE, 2010, p. 5).

The purpose of feedback is to provide guidance to learners on their work, what was done well, what could be improved, and perhaps how the learner can take their work to the next level. Mohr (2010) claims that feedback that is provided well should enhance the learner's motivation, confidence and self-esteem as well as provide direction. Mohr (2010) further states that providing feedback benefits the instructor by providing the opportunity for growth of: personal and professional skills; communication skills; and should provide progress on learners and therefore satisfaction for the instructor.

Types of Feedback

Types of e-feedback include: formative, summative, formal, informal, intrinsic, extrinsic, internal, informational, instructional, corrective, and appreciative. It may involve activities and strategies such as: participation, interaction in discussion, feedback to groups about group work (private or publicly submitted), peer, reflective, authentic, group, individual or collaborative (Costello & Crane, 2009).

Formative feedback is provided during or after formative assessment. Nicol (2009) claims that formative assessment is used "to enhance student learning (formative assessment, or assessment **for** learning)" (p. 13). Formative assessment should be used early in the course to provide learners with an opportunity to adjust their work and increase their potential for success.Formative assessment is especially beneficial for first year learners and learners who may have concerns about their ability to succeed (Yorke, 2004).Learners should be encouraged to self-regulate and take responsibility for their learning. Providing supportive formative feedback where learners decide how they will act on the feedback is one way to promote self-regulation. Another way is to encourage learners to use peer review or peer feedback (Nicol, 2009). Providing formative feedback assists the learning process (Boud, 2009; Bull & McKenna, 2004; O'Reilly & Morgan, 1999; Sclater, Conole, Warburton & Harvey, 2007).

Summative feedback has multiple purposes. It is used "to judge and certify learning achievements (summative assessment, or assessment **of** learning)" (Nicol, 2009, p. 13). Summative feedback should provide guidance for learners on what was proficient and unique about their work as well as insight on how to improve for the future. Summative assessment should take place later in a course as learners need time to experiment with the course content in a safe manner (Nicol, 2009). It is administered for grading and certification purposes (Boud, 2000; Bull & McKenna, 2004; O'Reilly & Morgan, 1999). For this reason it is sometimes

referred to as credit bearing or high stakes (Sclater, Conole, Warburton & Harvey, 2007; Sclater & Howie, 2003).

Constructive and formative feedback play a large role here, summative assessment is primarily for making decisions to assign grades (Blumberg, 2009, p. 20). Table 1 outlines various types of feedback, including formative and summative, that could be used in liberal arts higher education.

Table 1 Feedback Types

Feedback Type	Description
Formative	used early in the course to provide learners with an opportunity to adjust their work and increase their potential for success. (Nicol, 2009) providing feedback to assist the learning process. (Bull & McKenna, 2004; O'Reilly & Morgan, 1999; Sclater, Conole, Warburton & Harvey, 2007)
Summative	takes place later in a course as learners need time to experiment with the course content in a safe manner. (Nicol, 2009)
Formal	requested or expected feedback provided to improve future work. It is usually associated with submitted assignments and formal online discussions, as well as course and program evaluations. (Bull & McKenna, 2004; Nicol, 2009; O'Reilly & Morgan, 1999)
Informal	provided through informal discussions, body language, tone, choice of words, etc. (Bull & McKenna, 2004; Nicol, 2009; O'Reilly & Morgan, 1999) uninvigilated. (Sclater, Conole, Warburton & Harvey, 2007)
Intrinsic	"feedback that which is given as a natural consequence of the action". (Lourillard, 2007, p. 55)
Extrinsic	"does not occur within the situation but as an external comment on it: right or wrong, approval or disapproval". (Lourillard, 2007, p. 56). It should mimic intrinsic feedback.
Internal	learners monitor their own work through reflecting and self-assessment. (Nicol, 2009)
Informational	provides guidance on how well a learner is doing. It may be just a letter grade or number. Some may consider this to be similar to summative feedback. (Mohr, 2010)
Instructional	guides the learner on how to improve their work, why their work is exceptional, or how to take it further. This may be considered part of formative feedback. (Mohr, 2010)
Corrective	gives information to the learner on what they have done wrong, and why is it incorrect. (Mohr, 2010)
Appreciative	is the "Great Work" or "Thanks for sharing your experiences" that is

	important for the learner to hear or read. The learner needs to know that what they do is important and valuable. (Mohr, 2010)

Feedback and assessment is approached differently depending on the instructor's philosophy or theory of learning employed. The JISC (HEFCE) 2010 report claims that an associative perspective of learning, focuses on acquiring competence, uses assessments that are frequent, and consider the steps to complete a task. The feedback considers weakness in skill with the purpose of improving the skill. The constructivist approach to learning focuses on the learner achieving understanding. The assessment is usually experimentation, discovery or problem based learning. The feedback is often arises from reflection and self-regulation. The social constructivist perspective on learning also focuses on learners achieving understanding. Learner collaboration and involvement in the assessment design are key. The feedback is often peer feedback. The situative perspective views learning as a social practice where learners are involved in a community of practice. Authentic and holistic assessments are often used. Feedback is socially produced from multiple sources.

Guidelines for Providing Feedback

Lourillard (2007) claims that feedback is a weak link in the teaching - learning process because "there is only a small amount of relative [feedback] to their learning actions" (p. 81). Using frequent and detailed feedback can improve the weak link. Detailed comments will let a learner know where they did great work, where they may have misconceptions, and how to improve. Critical thinking (CT) can be promoted by asking questions, encouraging learners to take their work to the next level. This can encourage the learners to think about their work, how it can be improved, what was great about the paper, to reflect on the process and how it can be improved (Costello & Crane, 2009).

Critical thinking requires constant reflection, self-regulated deliberations on task, exploring or generating alternatives, evaluative judgments based on criteria & standards. It has the added dimensions of intellectual habits, intellectual deliberations and reflexivity. Critical thinking should: (a) present a critical challenge situation or trigger; (b) require an evaluative judgment; and (c) require justification for that judgment. Judgments, as the outcome of CT, are purposefully determined and are integral to forming values and engaging in direct actions. Without the opportunity to justify their judgements, engagement in and mastery of the CT is compromised for learners. Learner-produced outcomes would be appropriate; and with guidance, learners can progress steadily. The assessment should reflect the opportunities provided by instructors in the instructional and engagement components. Learners need opportunities to demonstrate their proficiency as well as understand the criteria and standards to which this will be assessed.

Instructors should inform learners at the beginning of the course, in the syllabus, ideally, how their assignments should be submitted and how feedback will be provided. Instruct learners to include their name and the assignment title in the title of the document. Be sure to provide learners with the level of detail in your feedback, whether paper-based or electronic, that allows learners to clearly understand what they did well and where they could improve their work.

If using dropboxes for submission of assessment items and returning of feedback setup dropbox folders for each of the assignments. Become familiar with the applications and technologies you plan to use and seek support for any questions as they arise. Create a folder on your hard drive or file storage area in which you will save the learner submissions as well as your feedback each semester for each of the courses in which you plan to provide feedback in this manner (Costello, 2009).

Sewell, Firth and Colvin (2010) relay Fain and Bates' (2005) recommendation that instructors can promote honesty with written assignments by following several principles including: (a) make clear to learners what plagiarism is, (b) require learners to complete the writing assignment over a semester, and (c) require documentation of originality.

Nichol (2007) outlines seven principles of good feedback practice, each of which support the development of learner self-regulation: (a) helps clarify what good performance is (goals, criteria, standards); (b) facilitates the development of self-assessment and reflection in learning; (c) delivers high-quality information to learners about their learning; (d) encourages teacher and peer dialog around learning; (e) encourages positive motivational beliefs and self-esteem; (f) provides opportunities to close the gap between current and desired performance; and (g) provides information to teachers that can be used to help shape teaching .

Lizzio and Wilson (2008) claim that learners appreciated feedback that was: developmentally focused, especially with comments related to the course goals; encouraged learners; engagement, for example, when a learner felt that the tutor or instructor had taken time to read and reflect on what was submitted; provided encouragement through acknowledging achievements and effort; as well as using a "considerate tone" when making comments; and comments were fair. It is important to be careful of tone as being too brief may be perceived as brusque or rude (Ko, 2009).

Feedback should be SMART. That is, feedback that is **S**pecific, **M**eaningful, **A**pplicable, **R**eflective and **T**imely. (Costello & Crane, 2009; Crane 2010). The feedback should be specific and meaningful to the learners and the current task. It should be transferable to future work. It should promote introspection for learners and be provided closely upon the assessment event. Fink (2003) uses FIDeLity feedback. "This acronym refers to feedback that is Frequent,

Immediate, and Discriminating (bases on clear criteria and standards), and delivered Lovingly." (p. 83). Frequent feedback aids the learner in avoiding building on their misconceptions and allows them to see their improvement as the course continues. The sooner the feedback is provided the better; ideally before they have moved on to other topics. Using a rubric or other method of clearly stating expectations, criteria and standards helps the instructor remain objective when providing feedback. Delivered lovingly would require that the learner be the focus of the feedback. The instructor's choice of words, tone, spelling, should be considered. Providing feedback when overtired often leads to regrettable comments (Costello & Crane, 2009).

When providing feedback, it should be worded so that the learner does not interpret it as personal criticism, but of their work (Mohr, 2010; Yorke, 2004). To provide learner-centered feedback, tutors or instructors should demonstrate content knowledge and respect for the learner (Mohr, 2010). It is important not to overwhelm a learner with feedback but focus on the most important areas for improvement. Providing feedback is not an opportunity for instructors to show all they know (Costello & Crane, 2009). Rowntree (1994) suggests considering the purpose, how and what, standards and resources needed to develop the assessments and associated feedback.

Learners will appreciate clear and comprehensive feedback on their assignments; the positive benefits of which will be enhanced by receiving it electronically. E-feedback is suitable for any assignment. Should an assignment include an activity that cannot be submitted electronically, such as a presentation or a physical model, learners can still submit a notice of completion to the instructor to which e-feedback can be appended. Should the presentation be

recorded, annotations can be provided on the submission itself or in a new feedback file (Costello & Crane, 2009).

Rubrics can be used to guide assessment as well as feedback. This tool can aid learners in preparing their assignments, as well as help the marker provide detailed and equitable feedback. Rippé (2009) reminds us that a "well-designed rubric is an effective communication tool. It emphasizes the important skills or concepts to demonstrate. It provides criteria for evaluation and takes the intangible on an unfamiliar assignment and makes it more tangible."

Feedback forms can also be used for guiding peer feedback. "To use feedback forms for peer review effectively, the instructor can provide a sample paper that has been scored using the form" (Palloff & Pratt, 2004, p.37). Tuzi (2001) claims that when learners provide peer feedback they also increase their participation as well as critical thinking skills.

Methods of Providing Feedback in the Digital Era

Bates' (2008) comments that:

> the technology of teaching is only one of many different variables that influence the effectiveness of learning. In particular, the way a particular technology is used – more accurately, its quality – is very important. … It is important to look at the conditions that lead to the successful or inappropriate use of different technologies. In particular, the appropriateness of a particular technology will depend on the context in which it is to be used (p. 222).

Many methods are suitable for e-feedback in multiple contexts (a) automated tutors; (b) peer feedback; (c) auto-scoring of assignments; (d) reflective networks; (e) written comments on an assignment; (f) oral comments in discussion group; (g) meta-verbals; (h) emoticons; (g) self-checks; and (h) ePortfolio (Anderson, 2008; Costello, 2009; Costello & Crane, 2009; Crane, 2010).

Byrd Steinweg, Carver Williams and Hopefengardner Warren (2006) reported learners' preferences for e-feedback as (a) typed in document; (b) handwritten digital file; (c) handwritten mailed (d) phone feedback; (e) highlighted rubric; and (f) face-to-face.

Denton, Madden, Roberts and Rowe (2008) report that emailing e-feedback expedites its return. They also suggest the use of pre-written comments that would be common across multiple assignments to aid in providing feedback. Learners perceived that the electronic feedback was: clearer; easier to read and understand; fairer; and had more relevance to the learners' work. These technologies not only augment the teaching and learning process but also provide data and/or artifacts that can help to satisfy assessment objectives (Buzzetto-More & Alade, 2006).

There are several technologies for providing electronic feedback: (a) word processors; (b) pen technology (tablet); (c)digital audio ; (d) digital video (e) automated; and (f) personal response systems. These methods and examples are discussed below.

Word processing or typed feedback both clarifies the marking scheme while being easier to read than handwritten comments. It also reduces marking time and expedites its return (Denton, Madden, Roberts & Rowe, 2008). Typing comments on a document using track changes, comment bubbles, notes, text boxes or by placing documents in tables and recording comments in a newly added column is a quick and convenient means of seeing feedback and parts of the assignments to which they relate. The comments can easily be aligned to the area of the text to which the feedback relates. Annotated files should be converted to a portable document format (pdf) before returning to learners for security purposes (Costello, 2009; Costello & Crane, 2009).

Related to word processing is the use of tools in Adobe pdf files. Users can avail of tools such as the typewriter, highlighter, call out box, sticky, free style pen or text boxes to record feedback. Both audio and video files may be embedded in the pdf files; though this often dramatically increases the document's file size.

Pen top computing allows teachers to review, comment, add to, and access handwritten learner notes and work. The pen technology requires instructors to 'write' their comments on the learner's paper on screen and save these comments to the file. The script can also be converted to text with some technologies. This provides flexibility in terms of being able to jot notes in the paper's column, as was always done, in providing feedback. The instructor is not daunted with having to type feedback but simply 'write' it (Costello, 2009; Costello & Crane, 2009).

Steinweg, Williams and Warren (2006) report that tablet PC feedback allows "efficient, specific, and detailed feedback on assignments." (p. 11). Numerous benefits noted include: (a) instructors can more effectively respond to assignments; (b) less instructor time required; (c) variety of visual effects – coloured ink, highlighter, line width; (d) ease of comment correction and erasure; and (e) personalized interactions between instructor and learners. The *written* text can be saved to the learner's assignment, having been automatically converted to electronic text font. Using a tablet PC to provide feedback increases efficiency and details in feedback. Instructors are able to make comments in the margins using a stylus and return the work to learners. Learners appreciate see exactly where the improvements can be made and see this as a "personal touch".

Audio feedback's portability and easiness necessitates minimal training for users; allowing for quick creation, downloading and playing of files in multiple formats on numerous devices which can be listened to at learner's convenience. Compact, portable file types are *mp3*

and *wav* files. Reportedly, being able to attune to instructors' nuances in messages also has a positive impact on learners' cognition and engagement. (Oomen-Early, Bold, Wiginton, Gallien & Anderson, 2008). Audio feedback reportedly is preferred to text-based feedback as it facilitates conveyance of nuances while enabling retention and application of content. This method also helps depict instructors as positive influences for learners (Ice, Phillips, Curtis & Wells, 2007). Oomen-Early, et al (2008) note that technology can mediate human relationships affording a sense of presence, cognizance, and connection. Recording audio feedback provides a means for instructors to 'say' what they would like regarding the assignment. The audio file is either attached to the electronic assignment or returned to the learner as feedbacks file (Costello, 2009; Costello & Crane, 2009). Merry and Orsmond (2008) found that the use of audio feedback was appreciated by learners. Learners found that the tutor's tone of voice and inflection aided in understanding. Many learners listened to the audio files multiple times and made notes on their assignments.

Ice, Curtis, Phillips and Wells (2007) used audio and text feedback in a graduate level course. Learners appreciated and preferred the audio feedback claiming that audio feedback provided nuance that is not easily conveyed in text alone. Learners reported feeling more engaged, often replaying the audio. As a result of the audio feedback, the learners reported a belief that the instructor cared about them as individuals. Also, learners reported that they retained the information obtained in the audio feedback more that information received via text. Instructors reported shorter marking time while increasing the number of comments or suggestions provided, creating a win-win situation. It increased teaching presence and at the same time decreased social distance. Learners reported that they believed that the instructors who used audio feedback care more about the learners' work.

Video feedback affords multiple communication benefits not otherwise possible (Denton, Madden, Roberts & Rowe, 2008) such as body language, facial expressions, objects, demonstrations, etc.. Increasing the teaching presence through video feedback was shown to have a positive impact on the learners (Parton, Crain-Dorough & Hancock, 2010). Multiple video formats are available, including *mp4*, *mov*, and *avi*. A one-minute video will take upwards of 1MG of storage space making them less portable than audio.

Digital video/audio lecture capturing synched with tablet pc presentations and activities provide an archived record of teaching effectiveness for assessment demonstration (Costello, 2009). According to the HEFCE 2010 report, learners believe that video or audio feedback is a more personal approach and provides more helpful detail than written feedback.

Automated feedback is provided by the computer. When a learner completes a task, such as a drag and drop exercise or a multiple choice question, the learner can be provided with immediate feedback. This may require some programming, but if carefully done, the program can be reused for other activities. Another advantage of these programmed exercises is that learners can repeat them multiple times. It's important when designing the automated feedback to allow learners a way to advance to the next stage.

Integrated student response keypads (clickers) allow for real time whole class questioning and data collection and analysis (Costello & Crane, 2009). Clickers can be provided to learners with course packs or, in many cases, learners can use their handheld devices (smart phones or itouch) to submit responses. They provide immediate feedback as learners are able to see both the correct response to instructor's questions and compare their own responses to that of the rest of the class. This gives a good indicator of their own personal learning and an indication to the instructor of how the class is progressing or may need additional instruction.

Conclusion

Learner-centered feedback is an important component of the learning process. Therefore, anything that instructors or markers can do to increase the impact of feedback in an efficient manner is worth doing. Providing effective feedback in an efficient manner is a challenge (Crane, 2010). Technology and planning can reduce the time and energy required to provide valuable feedback. Initially, it may require extra time but it will save time in the long run. Friesen (2009) suggests "*learning* something about these technologies, about their educational contextualization, and to compare this knowledge with the ways that technology and its educational contextualization is already understood in the research". (p. 39).

Feedback and assessment are intricately related. The feedback discussed here has been in response to assessment and is not discipline-dependent. Many strategies and technologies may be used in creating and disseminating this feedback. In JISC 2010 report on *Effective Assessment in the Digital Age",* Mark Russell is quoted as saying: "Good assessment is the right of all our students" (HEFCE, p. 7.). Taking this a step further: quality feedback is the right of all learners.

References:

Anderson, T. (2008). Towards a theory of online learning. In T. Anderson (Ed.), *The theory and practice of online learning* [Electronic Version]. Athabasca, Canada: Athabasca University Press, 91-119. Retrieved from http://www.aupress.ca/books/120146/ebook/02_Anderson_2008_Anderson-Online_Learning.pdf.

Bates, T. (2008). Transforming distance education through new technologies. In Evans, T., Haughey, M., and Murphy, D. (Eds.) *The international handbook of distance education* [Electronic version]. Bingley, U.K.: Emerald Press. Retrieved from: http://www.tonybates.ca/wp-content/uploads/2008/07/evans.pdf.

Bennett, R. E. (2002). Inexorable and inevitable: The continuing story of technology and assessment. *Journal of Technology, Learning, and Assessment, 1*(1), 1-24. Retrieved from http://www.jtla.org.

Blumberg, P. (2009). *Developing Learner-centered Teaching: A Practical Guide for Faculty.* San Francisco: Jossey-Bass.

Boud, D. (1988) Moving towards autonomy, in D. Boud (ed.) Developing Student Autonomy in Learning. 2nd Ed. London: Kogan Page, 17–39.

Boud, D. (2000) Sustainable assessment: Rethinking assessment for a learning society. *Studies in Continuing Education 22*(2):151- 167.

Boud & Associates (2010). Assessment 2020: Seven propositions for assessment reform in higher education. Retrieved from http://www.iml.uts.edu.au/assessment-futures/Assessment-2020_propositions_final.pdf.

Bull, J. & McKenna, C. (2004). *Blueprint for Computer-Assisted Assessment*. Routledge Falmer: New York, pp. 52–62.

Buzzetto-More, N. A. & Alade, A. J. (2006). Best Practices in e-Assessment. *Journal of Information Technology Education,* 5, 251-269.

Cantor, J. (2008). *Delivering instruction to adult learners* (3rd ed.). Toronto: Wall & Emerson.

Costello, J. (2009). E-feedback Best Practices. Unpublished Report, Distance Education and Learning Technologies, Memorial University, Newfoundland and Labrador, Canada.

Costello, J. & Crane, D. (2009, October). *Providing learner-centered feedback using a variety of technologies.* Paper presented at EDGE 2009 conference, St. John's, Newfoundland.

Crane, D. (2010). *Feedback to enhance learning.* Unpublished Manuscript, Centre for Distance Education, Athabasca University, Alberta, Canada.

Denton, P., Madden, J., Roberts, M. & Rowe, P. (2008). Students' response to traditional and computer-assisted formative feedback: A comparative case study. *British Journal of Educational Technology*, *39*(3), 486-500. doi:10.1111/j.1467-8535.2007.00745.x.

Farmer, L. S. J. (2005). Using technology to facilitate assessment of library education, *Teacher Librarian, 32*(2) 12-15.

Fink, L. D. (2003). *Creating significant learning experiences.* San Francisco: John Wiley & Sons.

Friesen, N. (2009). *Rethinking e-learning research: Foundations, methods and practices.* New York: Peter Lang Publishing.

HEFCE. (2010). *Effective Practice in a Digital Age: A guide to technology-enhanced assessment and feedback.* London: JISC. Retrieved from: http://www.jisc.ac.uk/media/documents/themes/elearning/effpraceassess.pdf.

Ice, P., Curtis, R., Phillips, P. & Wells, J. (2008). Using asynchronous audio feedback to enhance teaching presence and students' sense of community. *Journal of Asynchronous Learning Networks, 11*(2), 3-25.

Kellough,R. D., & Kellough, N. G. (1999). *Middle school teaching: A guide to methods and resources* (3rd Ed.). Upper Saddle River: Merrill.

Ko, S. (2009). Different approaches to providing feedback in the online classroom. Newburyport, MA: Sloan-C. Retrieved from http://www.sloanconsortium.org/node/1557.

Lizzio, A. & Wilson, K. (2008). Feedback on assessment; students' perceptions of quality and effectiveness. *Assessment & Evaluation in Higher Education 33*(3), 236-275. doi: 10.1080/02602930701292548.

Lourillard, D. (2007). *Rethinking University Teaching* (2nd Ed.). NewYork: Routledge Falmer.

McConnell, D. (2006). Chapter four: Assessing learning in e-groups and communities in D. McConnell (Ed.) *E-Learning Groups and Communities*. Maidenhead: Open University Press.

Merry, S., & Orsmond, P. (2008). Students' attitudes to and usage of academic feedback provided via audio files. *Bioscience Education 11*. Retrieved from http://www.bioscience.heacademy.ac.uk/journal/vol11/beej-11-3.aspx.

Mohr, D. (2010, July). *Providing effective feedback in online courses for student learning*. Sloan C Foundation Webinar.

Nichol, D. (2007). E-assessment by design: using multiple-choice tests to good effect. *Journal of Further and Higher Education, 31*(1), 53-64.

Oomen-Early, J., Bold, M., Wiginton, K. L. Gallien, T. L. & Anderson, N. (2008). Using Asynchronous Audio Communication (AAC) in the Online Classroom: A Comparative Study. *MERLOT Journal of Online Learning and Technology*, *4*(3), 267-276.

O'Reilly, M. & Morgan, C. (1999). Online assessment: Creating communities and opportunities. In S. Brown, P. Race & J. Bull (Eds), *Computer Assisted Assessment in Higher Education.* London: Kogan Page SEDA, 149-161.

Palloff, R., & Pratt, K., (2009). *Assessing the Online Learner.* San Francisco: Jossey-Bass.

Parton, B., S., Crain-Dorough, M. & Hancock, R., (2010). Using flip camcorders to create video feedback: Is it realistic for professors and beneficial to students? *International Journal of Instructional Technology & Distance Learning 7*(1), 15-23. Retrieved from http://www.itdl.org.

Race, P., Brown, S., & Smith, B. (2005). 500 Tips on Assessment. Retrieved from: http://books.google.ca/books?hl=en&lr=&id=PfuUaCXVS4EC&oi=fnd&pg=PR8&dq=%22500+tips+on+Assessment%22&ots=3yALQO88sX&sig=L0tqZ5WaEbioIRMgqcVy5UokD_o#v=onepage&q=%22nothing%20that%20we%20do%20to%2C%20or%20for%2C%20our%20students%22&f=false.

Ridgway, J. and McCusker, S. & Pead, D. (2004) Literature review of e-assessment, *Unspecified*. Bristol: Futurelab.Retrieved from http://dro.dur.ac.uk/1929/1/Ridgway_Literature.pdf.

Rippé, C. (2009). Using Rubrics to Improve Online Teaching, Learning and Retention. *Faculty Focus.*

Rogers, W. T., Cheng, L., Hu, H. (2007). ESL/EFL Instructors' beliefs about Assessment and Evaluation. *Education canadienne et international*, *36*(1), 39-61.

Rowntree, D. (1994). Preparing Materials in Open, Distance and Flexible Learning: An Action Guide for Teachers and Trainers. London: Kogan Page.

Schmitt, E. M., Hu, A. C. & Bachrach, P. S. (2008) Course Evaluation and Assessment: Examples of a Learner-Centered Approach, *Gerontology & Geriatrics Education, 29*(3), 290-300.

Sclater, N., Conole, G., Warburton, B. & Harvey, J. (2007). Eassessment in G. Conole and M. Oliver (Eds.) *Contemporary perspectives in e-learning research: themes, methods and impact on practice,* London: Routledge.

Sclater, N., Howie, K. (2003). User requirements of the 'ultimate' online assessment engine, *Computers and Education, 40*(3), 285-386.

Sewell, J. P., Firth, K. H. & Colvin, M. M. (2010). Online Assessment Strategies: A Primer. *MERLOT Journal of Online Learning and Teaching, 6*(1) 297-305.

Simonson, M., Smaldino, S., Albright, M., & Zvacek, S., (2006). *Teaching and Learning at a Distance (3rd ed.)* Upper Saddle River, NJ: Pearson

Stienweg, B., Williams, S. C., & Warren, S., (2006). Reaching through the screen: Using a tablet PC to provide feedback in online classes. *Rural Education Quarterly 25*(2), 8-12.

Tuzi, F. (2001). E-Feedback's impact in ESL writers' revisions. Paper presented at the annual meeting of Teachers of English Speakers and Other Languages (TESOL) St. Louis, MO. Retrieved from http://eric.ed.gov/PDFS/ED463651.pdf.

Yorke, M. (2004). *Formative assessment and student success,* Glasgow: QAA Scotland. Retrieved from http://www.enhancementthemes.ac.uk/documents/events/20040604/Yorkepaper-revised.pdf.