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All Ears?

Rationale for the Use of Screencasting as a Formative Assessment Tool

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All Ears Project: Rationale for the Use of Screencasting as a Formative Assessment Tool

Introduction

A substantial body of contemporary research provides evidence about the general potential positive effects of formative assessment (Black, Harrison & Lee, 2003; Black & William, 1998; Harlen, 2005a; Knight, 2002; Hattie, 1999). There is less research evidence regarding how e-learning might impact upon formative assessment practices and outcomes.

Screencasting software allows the user to record their computer screen alongside an audio narration. This project compares the experiences of tutors and students in creating and using “traditional” electronic text tutor feedback or screencast feedback.

Changing any aspect of assessment is likely to have an impact on both tutors and students. In the *production* of assessment feedback there will be impacts on time efficiency, the quantity of assessment and the characteristics of assessment comments. When students receive the feedback there will be differences in how they *perceive and use* that feedback.

The hypothesis with screencast feedback (based on a small scale pilot in Higher Education) is that the benefits of screencast feedback related to effectiveness of feedback comments and student engagement, will generally outweigh any increased time in producing such feedback. The pilot study results suggested that screencasting took the same time to produce as traditional feedback whilst altering the quantity of feedback – providing approximately twice as many feedback comments as traditional feedback. The nature of the feedback also changed, most significantly by increasing dialogic feedback, and process level feedback. Students comparing screencasts with traditional feedback expressed a strong preference for the former. They valued the quantity of detailed feedback, its sequential narrative of situated comments and the voice intonation cues it provided. Students felt that screencasts represented greater tutor “effort” and equated this with notions of “care”. It may be the case that in reality tutors were expending equal effort, but that screencasting exposed the assessment process in a way that other mechanisms did not. Once exposed to screencasting students appeared more likely to label other feedback practices as deficient in some respect.

A reasonable working hypothesis is that the increased feedback information provided by screencasting coupled with an improvement in student perception of the feedback would lead to subsequent improvements in learning outcomes.

1. BACKGROUND AND PURPOSE

Teachers spend a great deal of time producing assessment feedback to help students bridge a learning gap between their current position and a desired learning outcome. However, much assessment provides only a feed-out function (Knight, 2002) or summarising role (Harlen, 2005b)

which serves to confirm attainment or explain a grade. At its worst the act of assessment may be 'enormously expensive, disliked by both students and teachers, and largely ineffective in supporting learning' (Gibbs & Simpson, 2004, p.11). Writing feedback which is both efficient to produce for tutors and effectively used by students is problematic on a number of counts:-

1 Teacher time : Teachers' assessment practices must be both time-efficient and effective for learning. Knight (2002) points out that assessment and feedback have associated costs even if these are only opportunity costs in terms of tutor time. Macfarlane-Dick & Nicol (2004) acknowledge that providing feedback dialogue in large classes is problematic and where teacher workload causes a feedback delay there may be a negative effect on future performance (Hounsell, 2007). Clearly any proposed innovation must balance these concerns against potential learning benefits.

2 Quality of feedback: There is considerable variance in the quantity and quality of feedback provided to students (Hounsell, Xu & Tai, 2007). Ideally feedback will provide students with information about how they have performed and what to do next. Specific feedback would focus upon their task performance, understanding of the processes undertaken and their degree of self-regulation (Hattie & Timperley, 2007). There is evidence that assessors tend to focus upon peripheral elements such as quantity and presentation of work (Black & William, 1998). Particularly problematic is feedback which is ego-centred on the student's personal qualities. This has little value for learning and may actually be damaging to the feedback process even when in the form of well-intentioned praise (Hattie & Timperley, 2007; Kluger & DeNisi, 1996; Black, Harrison & Lee, 2003; Lambert & Lines, 2000). The very act of summarising advice and judgements in written form can act as a form of tutor self-censorship which may be helpful in focussing only on salient points, but may also lead to insufficient information for students to make progress.

3 Student perception and use of assessment: Many authors suggest that students frequently find the language used in assessment difficult to understand resulting in ineffective attempts to decode and act upon tutor (Macfarlane-Dick & Nicol, 2004; Carless, Salter, Yang, *et al.*, 2010; Boud & Falchikov, 2006). Even where students do receive accessible feedback summative elements such as grade comparisons with peers can dominate their thinking and subsequent actions, swamping the impact of formative comments (Boud, 1995; Butler, 1988). Some students see feedback as impersonal and judgemental - reflecting upon their innate potential rather than as information to make progress. This gap in intention and interpretation is problematic because it is seldom made explicit (Boud, 1995) and has emotional resonance which can impact negatively, perceptions of self-efficacy (Boud & Falchikov, 2006). Students are sometimes ineffective in adopting strategies to make use of feedback (Carless, Salter, Yang, *et al.*, 2010). For example they may decide to address only low value feedback (e.g. grammar corrections) in a mechanistic fashion. In many cases it may not be possible to determine whether students use feedback at all (Boud, 1995).

The problem then is how to efficiently assess work to make explicit students' performance in some learning task; to what extent their process and self-regulatory strategies are effective; and what they might do to sustain or correct their learning trajectory. Implicit here is that students must be engaged and see value in investing time and effort in decoding and acting upon feedback.

The idea of audio feedback is not new, for example see Cryer (1987). However, screencasting can include not just audio comments, but also visual cues situated in the assignment including text highlighting, mouse movements and links to support material such as websites. The student sees what the tutor sees and hears what they think throughout the assessment. This idea of a tutor recording (and therefore modelling) their thought processes in a narrative form presents a number of potential advantages:-

1. It could increase the amount of useful, specific feedback provided.
2. The mixed modality of situated visual cue and audio comment may focus attention more effectively than written annotation.
3. It may increase the time students spend engaging with feedback. They must invest a similar amount of time listening to comments as the assessor did in voicing them. Students may be more likely to skim-read than to “skim view”.
4. Vocal cues (pace and intonation) provide additional information helping students understand the tutor’s intention.
5. It potentially exposes the assessment process to students and models how assessment criteria are applied.
6. Screencasting may offer some affordances of face to face tutorials whilst providing more time for tutors to frame their responses and for students to understand comments (by replaying the tutor’s dialogue).

2. LITERATURE REVIEW

There is robust evidence from a number of large scale meta-analyses that formative assessment has a significant effect (effect sizes >0.4) on learning (Black & Wiliam, 1998; Kluger & DeNisi, 1996; Hattie, 1999; Hattie & Timperley, 2007). There is broad consensus that effective feedback makes a difference in the learning process learning (Black & Wiliam, 1998; Kluger & DeNisi, 1996; Hattie, 1999; Hattie & Timperley, 2007; Sadler, 1998). Such feedback may account for positive effect sizes as large as 1 standard deviation (Hattie, 1999). However ineffective feedback can result in a negative impact on both performance and motivation – as evidenced in around 1/3 of the 607 effect sizes examined by Kluger and DeNisi (1996). It would therefore seem important to determine the characteristics of “effective” feedback and in the context of this project to consider how feedback modality might also impact upon its value.

The complexity of learning and assessment makes a prescription for effective feedback highly improbable and even where feedback has demonstrated utility in one circumstance this may not be transferrable to other tutors and students (Sutton & Gill, 2010). It is also important to be aware that feedback may be successful in raising performance and motivation, but may not be sustainable to resource – and the withdrawal of such feedback is likely to have a demotivating impact upon students (Kluger & DeNisi, 1996). Nevertheless there is general agreement in the literature that the quantity, type and method of feedback differentially impact its effectiveness

and understanding these phenomena may provide guidance to tutors making decisions in their local circumstances (Sadler, 1998; Hattie & Timperley, 2007).

In the context of this project it is important to distinguish those factors which may be directly affected by feedback modality from those which may only be peripherally affected. Significant examples of the latter would be the timing of feedback and the provision of grade information alongside feedback comments. In the case of timing – provision of interim assessments with sufficient time for students to respond may be the most important assessment factor for improving student’s learning (Gibbs & Simpson, 2004), swamping the more modest effects of feedback modality (Brearley & Cullen, 2012). Grades are strong indicators of success or failure with little other informational content. Grade information can undermine the learning and motivational impact of tutor comments (Butler, 1988), result in unhelpful comparisons with peers and damage self-esteem or notions of self-efficacy (Black & William, 1998; Gibbs & Simpson, 2004). Although both timing and grade factors have been found to have significant effects to augment or attenuate feedback it is reasonable to assume that they would apply equally to either modality. However the potential for modality to influence these factors will be monitored during the research e.g. if screencasting took significantly longer to produce it may affect the timing of feedback.

2.1 Feedback Content

Differences in the quantities provided by feedback modalities may be important, but no simple correlation between providing more feedback and a learning or motivational effect appears in the literature (Hattie & Timperley, 2007; Kluger & DeNisi, 1996). Greater clarity emerges when considering feedback intention and the types of information conveyed via feedback. Feedback which provides information about both task performance and the extent to which an overall process has been understood appear to be of particular importance (Hattie & Timperley 2007). Task level feedback provides specific information about what to do next in terms of corrections or next steps whereas process level feedback explains how to generalise their learning to other contexts (Gibbs & Simpson, 2004). There is some consensus that a mixture of these levels of feedback is most beneficial for students. Task level feedback provides a foundation for progress in a learning task, but supplying too much feedback at the task level causes a focus on minutiae, preventing abstract thinking and generalizable learning (Hattie & Timperley, 2007). Meanwhile process level feedback in isolation may be too abstract for students to decode.

Clarity of communication maybe problematic, (Macfarlane-Dick & Nicol, 2004) and (Carless, Salter, Yang, *et al.*, 2010) suggest that students find the language used in assessment comments difficult to understand and so they are often are not effective in decoding tutor comments and closing the subsequent learning gap. (Boud & Falchikov, 2006) note that the “systematisation and formality found within educational institutions” can in itself obscure meaning and is rarely replicated in any other aspect of a student’s life. (Carless, Salter, Yang, *et al.*, 2010) note that the unilateral nature of comments exacerbates these problems.

There may be a mismatch between tutors' and students' expectations of assessment criteria, with students emphasizing low-level task oriented skills (such as spelling or presentation) whilst tutors expect high-level goals to be met such as conceptual understanding (Gibbs & Simpson, 2004). This may lead to students expending effort which has only a low-level impact upon their learning. It is therefore likely that feedback which explicitly discusses criteria is an important factor in effective feedback (ibid).

Feedback which encourages dialogue appears to be particularly effective in enabling students to self regulate their learning (Black, Harrison & Lee, 2003; Evans, 2013; Carless, Salter, Yang, *et al.*, 2010; Macfarlane-Dick & Nicol, 2004). This reframing of feedback as dialogue is identified as a good practice by Macfarlane-Dick & Nicol (2004) whilst Sutton & Gill (2010) highlight the emotional importance of such dialogue as a means to create a caring relationship which bridges the potential divide between tutor as instructor and assessor.

2.2 Affective Factors

Assessment is an emotionally charged process. For students, Sadler notes that feedback has the positive potential to act as a catalyst "to inspire confidence and hope" (1998, p.5). Whilst Falchikov and Boud consider that in the worst cases assessment can have an emotional impact that inhibits learning and lasts for many years. Despite these factors the affective domain of assessment appears to be an under-researched area. For example Evan's recent analysis of 460 articles over the last 12 years identified that "[d]espite the importance of affect in learning, only 2% of articles had this as their central theme" (2013, p.78). Cazzell and Rodriguez characterize this gap between an affective domain viewed as a gateway to learning and a lack of focus on the area as "the most neglected domain in higher education" (2011, p.711).

Student perceptions of "fairness" appear to be directly related with levels of student engagement with feedback (Sutton & Gill, 2010). Therefore, it is likely that feedback which clearly communicates justification of comments or marks may be particularly effective.

Students' feelings about feedback are mediated by their relationship with the tutor (Sutton & Gill, 2010). Feedback produced by tutors perceived as "uncaring" may be perceived as a "lack of interest and dismissed" (ibid, p.9). Interestingly the perception of care (or lack of) may originate from the feedback comments themselves, with generic feedback perceived as a powerful signifier of an uncaring tutor and conversely specific individual feedback equated with notions of care (ibid). Opportunities for comment initiated dialogue can help to make the intention of feedback clear and reduce some of the emotional charge inherent in assessment (ibid).

Feedback which offers explicit praise and encouragement may offer some motivational and confidence benefits (Gibbs & Simpson, 2004; Evans, 2013; Ferguson, 2011). However indiscriminate and ego-centred praise is likely to result in a devaluing of praise (Lambert & Lines, 2000). Such praise may be one of the most ineffective forms of feedback because it conveys little information and potentially dilutes other feedback (Hattie & Timperley, 2007).

Tutors also experience a range of emotions as they try to bridge an identity gap between caring teacher and objective assessor (Steinberg, 2013; Sutton & Gill, 2010). This dual role sees them balancing aspiration and pastoral care for their students against a set of (ideally) criterion referenced standards – a potentially stressful experience.

2.3 Screencasting and Audio Feedback

Hattie & Timperley's synthesis of 74 meta-analyses which reports "video-, audio-, or computer-assisted instructional feedback" (2007, p.84) as amongst the most effective forms of feedback (by effect size).

The literature search identified few sources which considered screencasting. Therefore the search was widened to include audio feedback (a pre-cursor to screencasting). In examining cases that use audio or screencasting there are two initial caveats:-

1. Electronic feedback generally causes positive effects in student perception. For example (Denton, Madden, Roberts, *et al.*, 2008) find students valuing electronic written feedback more highly than handwritten comments.
2. Most studies are small scale practitioner led and may be subject to halo or novelty effects.

Despite these cautions there is a high degree of congruence across the studies presented.

2.3.1 Teacher Time

Barring initial training time and technical errors many authors agree that audio feedback is at least as efficient as written feedback. Brearley and Cullen (2012) report equivalency with written feedback, whilst reports of time-savings range from a modest 2-3 minutes per script (Denton, Madden, Roberts, *et al.*, 2008) through to almost 40% faster (Macgregor, Spiers & Taylor, 2009). Not all studies are using similar technology, nor are they measuring equivalent activity in terms of the acts of composition and production. However, even modest time savings could assist teachers and produce large gains in terms of assessment quality (Lunt & Curran, 2010).

Rotheram (2008) reports that teachers felt positively about audio feedback and would continue using it *even if there were no time-savings*. Similarly (Cullen, 2011) found that although many feedback technologies increased time initially, verbal feedback was a more natural and enjoyable process than written feedback. Conversely, for screencasting Marriott and Teoh report feedback time as "significant and onerous" (2012, p.595), but felt these effects were related to specific software issues.

2.3.2 Quality Of Feedback

Rotheram (2008) notes that students found audio feedback overwhelmingly positive citing the level of detail and personal nature of the contact. Audio feedback was perceived as more detailed, richer and more bespoke than written forms, providing additional emphasis and intonation cues (Lunt & Curran, 2010).

Macgregor et al., (2009) suggests audio feedback may be more closely aligned with pedagogical concerns than in traditional written feedback. Specific improvements included feedback which established a personal relationship, clarified expectations, was detailed and easy to decode. Several authors draw direct parallels with tutorials, suggesting that audio feedback could emulate these meetings, with the additional benefit of a re-play mechanism (Brearley & Cullen, 2012; Macgregor, Spiers & Taylor, 2009; Marriott & Teoh, 2012). What is less clear is the effect on learning outcomes which in some cases appears to match control groups receiving standard written feedback. In contrast (Ice & Richardson, 2009) found that audio feedback increased both student involvement in the assessment process and retention of learning content.

Screencasting mirrors these findings - students report that screencasts provided clear, thorough, comprehensive guidance regarding strengths and weaknesses. An additional dimension was that students felt that feedback was personalised to them and discrete – a factor likely to engender a sense of “tutor care” (Marriott & Teoh, 2012).

2.3.3 Student Perception And Use Of Assessment

The majority of students preferred audio or screencast feedback to written, referencing clarity of feedback most frequently (Lunt & Curran, 2010; Brearley & Cullen, 2012; Marriott & Teoh, 2012; Cullen, 2011). For example in one study 85% felt that audio feedback was high quality, detailed and useful in identifying missing elements and improving subsequent work; 75% felt this was better than in written comments (Lunt & Curran, 2010). Similarly in screencasting the volume and detail of feedback was judged to be very favourable (Marriott & Teoh, 2012). The sequential nature of feedback helped some students understand the feedback. (Marriott & Teoh, 2012; Brearley & Cullen, 2012).

Students were more likely to collect and use audio feedback and to request more tutorials than with written feedback (Macgregor, Spiers & Taylor, 2009; Lunt & Curran, 2010). Students also reported replaying such feedback on multiple occasions (Brearley & Cullen, 2012). Recorded feedback therefore provides a mechanism to operationalize Macfarlane-Dick & Nicol’s view of effective feedback, where “...comments should indicate to the student how the reader experienced the essay as it was read – ‘playing back’ to the students how the essay worked – rather than offering judgemental comments” (2004).

Spoken language appears to offer some communication gains. Feedback is reported to be easier to decode (Cullen, 2011) and more personal (Marriott & Teoh, 2012). Voice intonation helped students to focus and ameliorated problems with tutor handwriting, students also commented that the recorded voice conveyed authentic emotion such as enthusiasm (Marriott & Teoh, 2012).

Students experiencing written, audio and screencast feedback expressed a preference to receive feedback in screencast form (71%) citing the situational visual cue as useful (Marriott & Teoh, 2012).

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