A cross-disciplinary evaluation of digitally recorded feedback in higher education

Michael Phillips
Monash University

Tracii Ryan
Monash University

Michael Henderson
Monash University

Research demonstrates that assessment feedback created using audio, video, and screencast recordings can offer advantages over text-based feedback. However, the majority of research and experience in this domain has largely been limited to a single disciplinary or cohort context. This project aimed to empirically investigate if recorded feedback (i.e. audio, video, and screencast) could be effectively implemented across different contexts, including disciplines. As part of this, teaching staff from five discrete subjects provided digitally recorded feedback to students on at least one assessment task. Assessment types included various forms of written assignments, completed by individuals or groups of students. This paper reports on survey data collected from 351 students who received recorded feedback or text-based feedback. Survey respondents were enrolled in five subjects across four disciplines (Education, Pharmacy, Engineering, and Management). To triangulate the survey findings, interview data from nine students are also included. Overall, the findings indicate that students in all disciplines found digitally recorded feedback to be more satisfying, more useful, and more engaging than text-based feedback alone. However, these outcomes differed across contexts; results tended to be elevated in subjects with smaller cohorts, and when richer audiovisual modalities were used. In two of the cases students', while still being overall positive, indicated that the feedback was less clear, usable and satisfying than indicated in other cases. These differences are explored and issues of teacher experience, cohort size, group assessment, and disciplinary cognate traditions are considered.

Introduction

Previous research has found that using digital recordings, such as audio, video, and screencasts, to provide assessment feedback can offer students and staff advantages over text-based feedback. Students have reported that digitally recorded feedback comments contain greater detail than text-based feedback comments, and are more supportive and personal. Students value the more detailed and conversational style of communication that digital recordings afford (Borup, West, & Thomas, 2015; West & Turner, 2016). Digitally recorded feedback comments have also been found to elevate students' perceptions of their relationships with their teacher (Anson, 2015; Knauf, 2016; Marriott & Teoh, 2012), as well as their levels of engagement (Crook et al., 2012; Hung, 2016; Morris & Chikwa, 2016). Educators also recognize the affordances of digitally recorded feedback, reporting that creating verbal recordings can save them time compared to writing text-based comments (Anson, 2015; Fawcett & Oldfield, 2016).

However, in general, the majority of research and experience relating to the use of digitally recorded assessment feedback has been largely limited to a single disciplinary or cohort context. As such, this project aimed to empirically investigate all three digitally recorded feedback practices across multiple disciplines. Contextual disciplinary differences have been found in a range of studies in higher education settings (for example, see: Hofer, 2001; Barzilai and Weinstock, 2015; Aditomo, 2017). The research goal of this study was to further explore the influence of context on students' perceptions of digitally recorded feedback comments, and to investigate if and how digitally recorded feedback could be efficiently and effectively implemented across disciplines and assessment types.

Method

A concurrent triangulation mixed methods design was used in this study, in which data were collected using an online survey and semi-structured focus groups. Ethics approval was received from the University's Human Research Ethics Committee before data collection took place.

Participants

As part of a wider study investigating the benefits of digitally recorded assessment feedback, an online survey was completed by a total of 372 students enrolled in six subjects across five disciplines: two from Education, one from Pharmacy, one from Engineering, one from Law, and one from Management. Survey respondents included 169 students who received digitally recorded feedback and 203 students who received text-based feedback only. It should be noted that responses of 18 students from one of the Education subjects were removed from the total sample, as their tutor failed to accurately follow the research procedure (Phillips, Henderson, & Ryan, 2016). Responses from all Law students (n = 3) were also omitted due to the fact that there were too few to include in the cross-disciplinary analysis. The final sample therefore included 351 students; however for the majority of analyses in this paper, the focus is on a subsample of 148 students who received digitally recorded feedback. Of these students, 55% were women and 51% considered English to be their first language. With regard to discipline breakdowns, 54 were Education students (100% women), 22 were Pharmacy students (73% women), 38 were Management students (66% women), and 34 were Engineering students (12% women).

Six focus groups were held with nine students who received technology-mediated feedback (eight from Education, and one from Management). The low student participation in the focus groups is potentially attributable to scheduling issues, as groups generally occurred at the end of semester when students may have been preparing for exams.

Materials

A 26 item online survey was used to gauge students' perceptions of the digitally recorded feedback, and the impact that it had. For the scope of this paper, data from six closed Likert-type questions are presented. These questions, referred to here as the *Feedback Attitudes Scale*, comprise two items related to the clarity of the feedback, two items related to the usefulness of the feedback for future work, one item related to the individualised nature of the comments, and one item measuring satisfaction with the feedback. A five-point scale measuring levels of agreement was used for the five items relating to the clarity, usefulness, and individualisation (1 = "Strongly disagree" and 5 = "Strongly agree"). The one satisfaction item used a 5-point scale measuring levels of satisfaction (1 = "Extremely dissatisfied" and 5 = "Extremely satisfied").

Semi-structured schedules were used to guide the focus groups with students. This included questions focusing on the impact of the recorded feedback, along with the students' consumption practices, perceived relationship with the tutor who created the feedback, and their perceptions of the suitability of recorded feedback in different contexts.

Procedure

Teaching staff from five disciplines were engaged in professional development activities designed to orient them to the use of digitally recorded feedback comments. They were then invited to provide feedback recordings to students on at least one assessment task.

Staff participating in this study were informed about the importance of timely and effective comments on assessment tasks and were provided with a recommended structure for the recordings, which included a salutation, relational work, a statement about the goal of the recording, evaluative summary of the assessment, textual issues, substantive comments with an emphasis on feed-forward, and a valediction and invitation to discuss the feedback further shown in Figure 1. In past studies, both students and teachers have commented on the positive benefits of recorded comments when this structure has been used (Henderson & Phillips, 2014; Phillips et al., 2016).
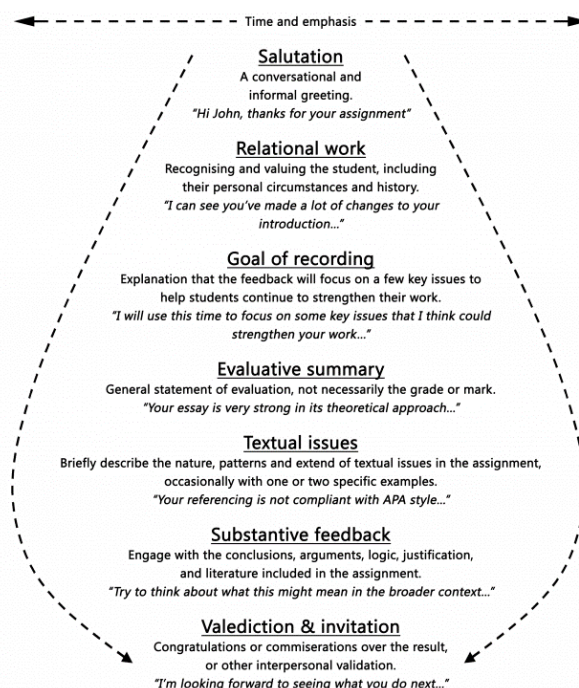

Figure 1: Structural Elements of Feedback Recordings (Henderson & Phillips, 2014)

Once the digitally recorded feedback had been returned, all students enrolled in the subjects under exploration were invited to complete the online survey through electronic notices placed on the learning management system of the subject. A question at the conclusion of the survey invited students who had identified themselves as

receiving digitally recorded feedback to participate in a focus group.

It is important to acknowledge the use of digitally recorded feedback in each discrete subject were seen as situated and exploratory. Rather than assuming the methods of digitally recorded feedback previously tested in one context should be replicated elsewhere, this project adopted the point of view that each assessor in each discipline should be empowered and encouraged to adapt the methods to best meet their context. As such, each of the subjects involved in the trial, while conforming to the overarching principles of content structure and media use, had its own unique application of the digitally recorded assessment feedback.

Some of the contextual differences in this study included choices of hardware, software, variations to the structure of feedback content (see Figure 1), student learning needs, and teaching style. There were also a number of key design differences including the different assessment types, whether the task was for individuals or groups, and the mode of feedback used. These features are illustrated in Table 1. Each subject has been pseudonymised using an identifier derived from the first three letters of the subject discipline: EDU for Education, ENG for Engineering, PHA for Pharmacy and MAN for Management. The two Education cases are further identified as EDU1 and EDU2.

Table 1: Overview of key contextual factors between each subject in which students received digitally recorded feedback

Identifier	Discipline	Student Level	Number of teaching staff creating recordings	Number of students receiving recordings	Assessment task		Modes of feedback used
					Individual/ Group	Type	
EDU1	Education	Masters	3	39	Individual students	Written essay	Video Screencast
EDU2	Education	Masters	4	136	Individual students	Written annotated bibliography	Video Screencast Audio Text Rubric
ENG	Engineering	First year undergraduate	3	49	Groups of four students	Written lab report for a design project	Screencast Text Rubric
PHA	Pharmacy	Second year undergraduate	1	85	Groups of four students	Written lab report	Video Rubric
MAN	Management	Masters	7	250	Individual students	Written career portfolio	Video Audio Text Rubric

Data analysis

The survey used in this study collected ordinal data using Likert-type scales. According to Gravetter and Wallnau (2004), "most of the commonly used statistical methods such as the mean, the standard deviation, hypothesis tests with the t statistic, and the Pearson correlation are generally considered to be inappropriate for ordinal data" (p. 635). Both Field (2009) and Gravetter and Wallnau (2004) therefore recommend calculating ranked means for comparisons between groups. As the survey in this study collected ordinal data, ranked means are presented in the results section (for more information about this procedure see Field, 2009).

Results and discussion

Earlier studies have reported that tertiary students tend to prefer digitally recorded feedback in comparison to text-based feedback (Henderson & Phillips, 2014, 2015; Phillips et al., 2016). To test whether this was the case in the current sample, ranked means were calculated for students who received digitally recorded feedback and those who received text-based feedback only (see Table 2). The results revealed that students who received digitally recorded comments had higher ranked means for all survey items than students who received text-based feedback alone.

Table 2: Comparison of Ranked Means for Students Receiving Digitally Recorded Feedback (N = 148) and Students Receiving Text-based Comments Only (N = 203)

Theme	Item	Digitally recorded	Text
Clarity	The feedback used language that was easy to understand	186.26	167.62
	The feedback had a clear message	193.88	162.03
Usefulness	The feedback provided constructive comments that you could use to improve your work		
	The feedback improved your confidence for completing future assessment tasks	194.95	160.31
Individualised	The feedback gave individualised feedback relating to your own assessment	197.42	159.44
Satisfaction	How satisfied were you with the feedback?	202.48	155.00

Students in all disciplines in this study indicated a preference for digitally recorded feedback, mirroring the findings from previous studies situated in a Faculty of Education context (Henderson & Phillips, 2015). Despite this general preference, it is interesting to observe variations in student experiences of different ways in which digitally recorded feedback was designed, created and disseminated to students. It is important to reiterate here that the use of digitally recorded feedback in each discrete subject was seen as situated and exploratory and this project adopted the point of view that each assessor in each discipline should be empowered and encouraged to adapt the methods to best meet their context. The contextual variation across discipline areas is evident when examining the ranked mean scores for students who received digitally recorded feedback comments only, on questions relating to clarity, usefulness, individualization, and satisfaction (see Table 3).

Table 3: Comparison of Ranked Means for Survey Items across Subjects for Students (N = 148) who Received Digitally Recorded Feedback Comments

Theme	Item	EDU1	PHA	EDU2	MAN	ENG
Clarity	The feedback used language that was easy to understand	100.00	87.68	74.45	73.50	55.15
	The feedback had a clear message	94.50	84.48	79.92	67.88	59.97
Usefulness	The feedback provided constructive comments that you could use to improve your work	96.69	66.50	79.03	73.64	65.13
	The feedback improved your confidence for completing future assessment tasks	91.50	67.50	78.84	81.50	58.35
Individualised	The feedback gave individualised feedback relating to your own assessment	105.65	59.20	84.46	76.49	56.40
Satisfaction	How satisfied were you with the feedback	96.41	70.30	69.66	77.62	66.53

As can be seen in Table 3, students from ENG had the lowest ranked mean scores for all survey items. The remainder of this paper compares and contrasts the digitally recorded feedback in the ENG case with the other four cases, in an attempt to better understand the influence of contextual factors shaping student experience with digitally recorded feedback. Results from the survey are discussed below, and are triangulated with the qualitative data from the focus groups.

Clarity of digitally recorded feedback

While the majority of students who completed the survey ranked digitally recorded feedback as having a clear message and using language that was easy to understand, the ranked means of students in MAN and ENG were lower than the number of students in EDU1, EDU2 or PHA.

There are a number of contextual factors that might explain this difference. First, both the ENG and MAN cases had substantially larger numbers of students receiving the digitally recorded feedback compared to EDU1, EDU2 or PHA. Second, the two EDU cases involved teaching staff who had been using recorded feedback for a number of years. These staff were also working in these units as educational leaders and therefore had a direct influence on the practices of other teaching staff. During staff meetings and moderation processes, the structure outlined in Figure 1 was discussed and any variations on this were negotiated with the staff leading the unit.

The following quote is from an EDU student who mentioned that the digitally recorded feedback was easy to understand:

> I think [the video feedback] just gave you that clearer detail than what you get if it's just a comment box on the side of a Word document. You understand what mean when they say something, just like instead of just a voiceless comment that you can't understand what the tone is or anything like that. (EDU1 student)

With regard to the ENG case, the situation was quite different, as 25 demonstrators were required to work with students, many of who were sessional staff members. The staff leading this unit were enthusiastic and had lead large teams of staff in the past, however this was the first occasion that they had lead a team providing digitally recorded feedback. In contrast to the staff familiar with digital feedback in EDU1, EDU2 and PHA, the level of guidance and direction for teaching staff in ENG who were new to this form of feedback was not as high. The digital recordings created by teaching staff in ENG were longer than the recommended feedback design; averaging 12-20 minute-long videos rather than five minutes. While each of the subjects involved in this trial were encouraged to shape the feedback design to suit their own context, it is arguable that videos containing substantially more information in a longer format may have detracted from the clarity of the message.

Clarity of digital feedback can therefore be influenced by micro-level contextual factors such as the past experiences of staff, particularly those leading teaching teams. The challenge for future research is to consider other micro-level factors such as individual vs group tasks or written vs practical tasks and how these might be understood together with meso- and macro-level factors to better understand the interrelationships between teachers' knowledge, practice, identity on the effectiveness of digitally recorded feedback.

Usefulness of digitally recorded feedback

One notable component of Table 3 resulted from data produced by students when asked to consider whether the digitally recorded feedback they received improved their confidence for completing future assessment tasks. In this instance, data from ENG students produced the lowest mean ranked score (58.35). Similarly, data from ENG students produced the lowest mean ranked score (65.13) when students were asked to consider whether the feedback they received could be used to improve their work. While it was beyond the scope of this study to investigate this full range of contextual factors that may have contributed to these experiences, extant literature may provide some possible answers.

Streveler, Litzinger, Miller, and Steif (2008) highlight the many questions that relate to the forms of knowledge required by engineers and those studying to become engineers. In particular, those authors state that "'becoming an engineer' [involves] inter-disciplinary knowledge, identification, and navigation" (p. 291) and that the development of conceptual knowledge is a core part of this 'becoming'. The authors posit a number of questions about the developmental trajectory of conceptual knowledge in the transition from novice to expert and suggest that the development of expert conceptual knowledge may be reliant on the development of 'threshold concepts' (Meyer & Land, 2006) or core ideas that can act as portals for understanding a range of more complicated topics.

The ENG case in this study was a first year, 'gateway' subject that provided foundational knowledge which students could then use as they chose increasingly specialized engineering subjects. It may be that the lack of confidence students expressed about their capacity to complete future tasks after receiving the digitally recoded feedback was because the threshold concepts were introduced in the ENG subject but students were yet to be provided with opportunities to apply this knowledge and therefore had difficulties making connections between the feedback comments and their imagined future performance. Additionally, the group nature of the task for ENG students may have resulted in some students completing one part of the task and therefore not developing the requisite skills and confidence to be able to complete future tasks based on those skills.

On the other hand, students in the focus groups recognized that the recordings provided content that could be useful in the future. For example, one student from EDU1 stated, "There were some comments about my writing and how that could be strengthened and that's going to be a clear advantage too, going and doing other assignments." Another student from the same subject said:

One piece of feedback I had was in relation to my use of quotation marks, singular and double, and how they were being used. That piece of information will certainly be taken forward in other assignments, so that improves my writing. But that type of feedback given in that context makes it more digestible.

Other students in the focus groups provided some interesting examples of why digitally recorded feedback may have more impact than text-only feedback:

A screencast forces you to connect with the feedback as a student and not just look at the mark and dismiss it and move on. You have to listen to five minutes or three minutes of feedback. So it's not just the mark flashing up at you on the screen, and the feedback's much more powerful in that format I found. (EDU1 Student)

It's another learning phase. It's not just engaging with your mark and what was thought about the work, it's actually thinking about how the work could've been improved (EDU1 Student)

These comments suggest that students were able to gain value from the recorded feedback by considering specific areas in which they could improve their future work. The reflective practices evident in these comments are skills that are developed as part of the transition from novice, pre-service teacher to expert, in-service teacher. Students studying to become teachers are often required to reflect on their own practices and those around them (for example, mentor teachers in schools) and this development of reflective practice continues for many teachers involved in action research, self-study, and narrative reports of pedagogical practice. This type of reflection is regarded as highly beneficial for students in Education subjects, even those in first year with limited teaching experience, as it helps them to develop the ability to self-regulate and to enhance their classroom practice. In contrast, the lower ranked mean scores produced by the ENG students suggests that these practices and the associated developmental skills may not be valued in the same manner in Engineering disciplines.

Data collected for this research does not allow more than speculation about these propositions; however, they do highlight the need for future research to not only focus on micro-level contextual factors such as the experience of teaching staff but also on meso- and macro-level factors such as the nature of knowledge and epistemic traditions in different cognate areas.

Satisfaction with digitally recorded feedback

Looking across the cases at students who received digitally recorded feedback, the ranked means of students from EDU1 and MAN were particularly high. The following comments from EDU1 students provides some insight as to why students may have been so satisfied with the digitally recorded feedback:

It was good information, it was helpful information and it sort of really connected to the piece of work which was great, which contextualised it in a more useful way because when you just read comments, they can be interpreted so many different ways. So this, with the video, you could see that he was really concerned about this part or he was really pleased about this part and that really helped. (EDU1 Student)

The comment above highlights the connection between personalization and student satisfaction with digitally recorded feedback. In contrast to written comments that "can be interpreted in so many different ways" (EDU1 Student), the richness of the video recording allowed a stronger connection between teacher and student to be interpreted by the EDU student – "you could see that he was really concerned about this part or he was really pleased about this part" (EDU1 Student). In previous work (Henderson & Phillips, 2015) we have made connections between media richness theory (Daft & Lengel, 1986), clarity of message and student satisfaction in EDU units. Data from this study suggests that, despite contextual differences between the current five cases, student satisfaction with digitally recorded feedback is generally very high.

We suggest that the feedback content design (see Figure 1), with its emphasis on relational work and feed forward, would have contributed to the students' sense of lecturer sincerity and feedback integrity. This was indicated by one student who stated:

I almost felt like when I finished the video like I'd been in [my tutor's] office having a chat with him…it felt like I'd had like a connection and something really quite meaningful. And I guess too, I felt that he'd valued us as students because someone had taken the time to really go

into my work and talk about it. I felt that it was a really rich experience. (EDU1 Student)

However, the implications of this perceived authenticity, and the link to the media affordances and feedback design need to be further explored in future research which also take into account other contextual factors shaping student experiences of digitally recorded feedback.

Conclusion

Drawing on a long history of contextual references, Burke (2002) highlighted that context is a term that has become more common in research. Described by some as a "contextual turn" (Lawson, 2008, p. 584), a focus on the conditions and circumstances of events has resulted in refined understandings of many phenomena; however, the increased contextual focus has also led to a number of problems. For example, Burke (2002) suggested "there is a price to be paid … the inflation or dilution of the central concept, which is sometimes used - ironically enough, out of context - as an intellectual slogan or shibboleth" (p.152). More particularly, Turner and Meyer (2000) indicate that educational researchers "have developed a folk definition of context that we think we all understand but truly do not use coherently or cohesively" (p.83).

This study has opened the discussion of contextual influences on student interpretations of digitally recorded feedback. Results from five cases involving tertiary students from four discipline areas indicates that the majority of students in all cases are satisfied with the feedback and find it clear, useful, and individualised. Contextual differences can help explain variations between cognate areas and implications for educators have been highlighted and include:

- clarity of digital feedback can be enhanced by the development of individual educator-student relationships. Data from this study suggests this is easier to achieve in classes with fewer students. Future studies should investigate ways in which the development of individual relationships can be scaled for larger classes.
- the impact of digitally recorded feedback is enhanced when future oriented comments are provided to students.
- feedback content design with its emphasis on relational work and feed forward contributes to the students' sense of lecturer sincerity,

feedback integrity and overall satisfaction with digitally recorded feedback.

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Contact author: Michael Phillips, Michael.Phillips@monash.edu .
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