Students' perceptions of eMarking: Grademark vs. iAnnotate[1]

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Abstract

Feedback on assessments is central to formative learning in higher education; it is also a main cause of dissatisfaction in student surveys. New advances in e-learning and eMarking have the potential to improve teaching and learning in this area. In this paper, we present an exploratory study gauging students' access rates and perceptions of eMarking feedback in two formats, Grademark and iAnnotate, across two large first year first semester interprofessional health science subjects at one university. Results indicate that, on the whole, students are satisfied with the quality, efficiency and convenience of submitting assessments and accessing feedback through eMarking in Grademark and iAnnotate. Furthermore, eMarking has the capacity to substantially improve student feedback collection rates. However, only half of the participants agreed that eMarking was superior to paper-based marking. In open comments, many students described difficulties that should be considered, related to saving feedback, ease of use and computer literacy.

Introduction

Feedback on formative assessments is central to teaching and learning in higher education (Gikandi, Morrow, & Davis, 2011; Villalon, 2012; Wharton, 2013). From a constructivist view of learning, feedback is imperative. It is closely aligned with improved student outcomes, as it allows students to gauge their performance against specific learning outcomes, reflect and make improvements to later assessments (Li & De Luca, 2014; Olson, Burton, Byron, & Turnbull, 2014; Wiliam, 2011).

Assessment feedback is a topic of growing interest amongst lecturers and teaching and learning scholars, especially in Australia and the United Kingdom (Li & De Luca, 2014). This interest is due in part to the high rates of student dissatisfaction with the quality, quantity and speed of feedback on written assessments which is a widespread and long-standing issue in universities in these countries (Bailey, 2009; Goel & Ellis, 2012). Students, faced with growing time pressures (Tinto, 2012), are increasingly focused on outcomes (grades) rather than process (feedback). Aware of this trend, teaching staff may be sceptical that students will read detailed feedback. Thus, they may be reluctant to provide more detailed feedback (Bailey, 2009). For these and other reasons, Merry (2013, p. xix) describes feedback on assessments as 'one of the most problematic aspects of the student experience… in need of further scrutiny.'

Advances in Information and Communication Technology (ICT) offer lecturers new means of administering, collecting, marking and returning feedback to undergraduate students (Espasa & Meneses, 2010; Gikandi et al., 2011; Yeh & Lo, 2009). Also referred to as 'Technology Enhanced Learning' (TEL), 'e-learning' (Devedzic, 2014), or more specifically related to assessment feedback, 'Onscreen Marking'(OSM) (Coniam, 2013) and 'e-Marking' (Villalon,

2012), these ICT advances have the potential to reduce the time associated with assessment processing and marking, and improve the quality and quantity of assessment feedback.

Developments in ICT, however, often outpace research into their applications in higher education settings. Educators should not assume that TEL is *a priori* better than other forms of teaching and learning. Recent evidence from an exploratory-study, for example, warns that eMarking is not necessarily faster. Olson et al. (2014) measured the time spent by tutors in three formats: hardcopy, tablet-based eMarking using iAnnotate and desktop-based eMarking using Grademark. Markers in this study found eMarking using Grademark to be substantially more time-consuming than marking in hardcopy, while those using iAnnotate found eMarking to take about the same amount of time as marking in hardcopy. These findings illustrate a need for further research into eMarking which is also highlighted by Li and De Luca (2014, p. 391) in the conclusion of their review of the assessment feedback literature: 'studies are needed on how the use of new technologies… can affect the practice of assessment feedback.'

This paper responds to these calls as well as to our own needs as lecturers, for evidence on which to base decision-making. To this end, we offer two comparisons. First, we offer a comparison of the percentage of students who accessed feedback in two mediums: paper-based and onscreen. Second, we present students' perceptions of eMarking in two formats: Grademark and iAnnotate. Following an overview of our methods, we present statistical and qualitative findings, offering university lecturers valuable insight into students' perceptions of the strengths and limitations of these tools.

Methods

The context

This study was conducted by the then lecturers (RO and CT) of two large first year first semester subjects for undergraduate health science students at one university: a large multi-campus university serving a diverse student population (Gill, Lombardo, & Short, 2013; Gill et al., 2011). An overview of the university's demographic characteristics illustrates the time- and other pressures that students likely face. Over half of the students are first in family to attend university; nearly a quarter come from low socio-economic backgrounds; and more than half work part-time (Gill et al., 2013). In an effort to level disparities in access to TEL, starting in 2013, each new undergraduate student at the university was issued with an iPad.

The subjects in which this study took place, Population Health and Society (PHS) and Professional Health Competencies (PHC) are the first two of six interprofessional common subjects that are compulsory subjects for students in the following allied health disciplines: health promotion, health services management, occupational therapy, paramedicine, personal development health and physical education (PDHPE), physiotherapy, podiatric medicine and therapeutic recreation. For students studying sports and exercise science and traditional Chinese medicine, PHC is a required subject, but PHS is not.

PHS, a subject with over 700 enrolled students, is designed to spark students' critical thinking about the social determinants of health, the complexity of patient-centred care and the health care system. To complete the subject, students are required to pass five assessments including: three online quizzes, eleven weeks of tutorial participation, a 500 word essay (due in the fifth week of semester), a 1000 word case study report (due in the twelfth week of semester) as well as a final summative exam (invigilated at the end of the semester). PHC, a subject with over

900 students, is designed to foster students' academic literacy skills and to introduce students to fundamental health care competences to maintain safe, ethical and legal practices in the health sciences. Assessments in this subject include: four competency-based compulsory-pass quizzes, two online tests, eleven weeks of tutorial participation, an annotated bibliography (due in the seventh week of the semester) and a case study (due in the final week of the semester).

Following poor rates of feedback collection on final assessments in 2013, we introduced eMarking into these subjects in 2014 for the first time. Paper submission of written assignments (the essay and report in PHS; the annotated bibliography and case study in PHC) was no longer required. Instead, students submitted their assessments through 'vUWS' – the university's online course management platform, hosted by Blackboard®. Submission folders were set up for each tutor on their respective vUWS sites and students were directed to upload their written work as word documents to their tutor's folder, linked with the plagiarism prevention and detection platform Turnitin©. We then used two different eMarking tools to provide feedback to students: Turnitin's Grademark (©2014) and Branchfire's iAnnotate (version 2.4.5).

The eMarking tools

Grademark, selected because of its availability with Turnitin, was used in PHC. It offers markers the ability to review, highlight, underline, insert comment boxes in-text (using customised comments and those from a 'bank'), grade (using a rubric created by the lecturer) and provide overall feedback on students' assessments (see Olson et al., 2014). iAnnotate was used in PHS. iAnnotate is a generic .pdf (portable document file) annotation tool that allows users, with their finger or stylus, to mark documents as they would in hardcopy, with lines, circles or drawings. Additionally, users can type directly on the document or insert text-bubbles that, when saved as a flattened .pdf, appear at the end of the document. This tool was selected based on the exploratory comparison of Grademark and iAnnotate, where iAnnotate was found to be a faster tool for marking when compared with Grademark (see Olson et al., 2014). The processing of assignments for marking and then posting the feedback using iAnnotate, however, took more effort than Grademark. In PHC, assessments were simply marked through vUWS using Grademark, with feedback released to students after all assessments had been marked. In PHS, students were asked to submit the marking rubric as the last page of their assessment, so submissions could be downloaded from each tutor's folder as single .pdf files and emailed to tutors, to be marked on an iPad using iAnnotate. Once marked and annotated, assessments were then uploaded to the gradebook system in vUWS and released to students.

The study

This study was part of a larger project with approval from the UWS Human Research Ethics Committee to examine student transitions and retention across the university. Our study focused on TEL in the above referenced first year first semester units for health science students. It had three components.

The first part involved the use of vUWS student tracking to identify students 'at risk,' as indicated by their lack of time on the online learning platform or failure of early, low risk assessments: online quizzes that were due in the first month of semester. Identified students were put on a list of names to be contacted by 'transition success': a team of later year students employed to phone students in their first four weeks of semester. Of the 67 students listed, 35 were successfully contacted. Calls ranged in length from a few seconds to over 18 minutes. Transition success assisted these new students with a range of issues ranging from needing a

reminder about assessments (15), to directions on where to go to address personal issues (12), to assistance with deferring or resigning (10).

The second portion of the study involved developing a questionnaire to be completed by tutors on their marking experiences using either Grademark or iAnnotate. This two-page survey included questions on the time taken to mark every second or every third assessment (depending on how many assessments tutors were required to mark) and on tutors' reflections on the process of marking in the designated form. These questionnaires were administered by a research assistant, to avoid any perceived coercion by tutors.

The third part of the study – and the focus of this paper – involved analysis of feedback collection rates and a survey of students in PHC and PHS on their satisfaction with the eMarking process. As poor rates of feedback collection on final assessments had been an issue in the previous year (2013), data on the number of students who viewed their final assessment feedback were collected by the research assistant at the end of the semester (2014), using the analytic tools readily available in vUWS. To gain exploratory insight into students' perceptions of eMarking, a brief five item survey, comprised of four Likert scale questions and one open-ended question, was developed by RO and CT and posted on the vUWS sites for both units, along with participant information sheets. One week after the return of feedback to students in the middle of the semester and at the end of semester, students in PHS and/or PHC (n=1180) were invited through their student emails, by a research assistant not involved in teaching in the subject, to complete the survey. A small minority of students, those students who had chosen to 'opt-out' from periodically being contacted to be involved in university research, were not emailed. In accordance with ethics approval of the study, this process was handled by a non-academic staff member at the university responsible for managing the larger, university-wide project and our research assistant. At the end of the semester, completed surveys were then de-identified and collated by our research assistant before being emailed to us for analysis.

Analysis

Following the call from Li and De Luca (2014) for mixed-methods research into assessment feedback, our analysis was both statistical and qualitative. Descriptive statistics were compared on the number of students who viewed their feedback on their final assessment in 2013 and 2014. For each survey item, the frequency of participants' responses as percentages was calculated. Comparison of the mean scores for iAnnotate and Grademark was undertaken using Statsoft (2006). Qualitative comments from surveys regarding iAnnotate and Grademark were analysed using the process of constant comparison as described by Corbin and Strauss (2008) to identify a set of open codes or themes which represented single conceptual phenomena identified in the data. No level of data saturation was achieved; however some relationships between themes were evident.

Results

Here, we report our findings on the third component of the project: students' review of feedback and perceptions of eMarking. Preliminary descriptive statistical analysis is presented first, followed by an overview of themes emerging from the analysis of qualitative findings.

Viewing feedback

In both units in the year preceding this TEL project, few students collected feedback on their hardcopy assignments. In PHS, a mere 42 students (9%) out of the 468 still enrolled by the end

of semester collected their feedback in hardcopy over two collection days announced to students through email and facilitated by administrative staff at two campuses. In PHC, collection rates of hardcopy assignments were similarly low, with 59 students (8%) out of 734 collecting their assessments.[2]

Following the introduction of eMarking, using Grademark in PHC and iAnnotate in PHS, the proportion of students accessing their feedback improved dramatically. In PHS, the percentage of students who accessed their feedback jumped from 9 per cent in 2013 to over 68 percent. PHC showed a similar trend, with 8 per cent of students accessing their hardcopy feedback in 2013, compared to over 66 per cent in 2014.

	Accessed feedback			Did not access feedback			Total	
Subject	n	%	Avg. time	n	%	Avg. time	n	%
PHS	506	68.4%	5 mins	234	31.6%	0 mins	740	100%
PHC	630	66.3%	2.6 mins	320	33.7%	0 mins	950	100%

Table 1: Number and percentage of students who did and did not access eMarking feedback

We do not have data on the amount of time that 2013 students spent reviewing their feedback in hardcopy. However, data downloaded from the analytics feature in vUWS offered insight into the amount of time students spent reviewing feedback in each eMarking format. In PHS, time spent viewing feedback ranged from 0-50 minutes ($\mu = 5$ minutes). In PHC, time spent viewing feedback ranged from 0-32 minutes ($\mu = 2.6$ minutes) (see table 1). This information will be valuable to future interventions and comparisons.

Satisfaction with eMarking

Of the 138 participants (response rate of 11.7%) who responded to the survey evaluating the use of iAnnotate, 75 per cent indicated that they were moderately to very satisfied with how quickly their assignment was marked and returned (see Table 2). In this same group, 67 per cent and 68 per cent stated that they were moderately to very satisfied with the level of detail in their feedback and the way in which this was documented using the annotation features in iAnnotate. Of the 116 participants (response rate of 9.8%) who responded to the survey evaluating the use of Grademark, 72 per cent indicated that they were moderately to very satisfied with how quickly their assignment was marked and returned. In this same group, 67 per cent and 66 per cent stated that they were moderately to very satisfied with the level of detail in their feedback and the ways in which this was documented (using text boxes and comment bubbles) respectively.

Remarkably, there was very little difference in students' ratings of Grademark and iAnnotate. Despite their positive ratings, only 44 per cent (iA) and 49 per cent (GM) indicated that this online marking experience was better than receiving paper-based feedback.

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[2] Readers will notice that student numbers in both subjects increased substantially from 2013 to 2014. This is largely due to the introduction of a new discipline within the school and the subject: paramedicine.

Part 1 : Satisfaction	Very unsatisfied	Unsatisfied	Neither satisfied or dissatisfied	Moderately satisfied	Very satisfied	Unanswer-ed	
How satisfied were you with how quickly your assignment was marked and feedback returned?	1.45%	3.62%	14.49%	57.25%	17.39%	5.80%	iA
	3.45%	6.90%	11.21%	55.17%	17.24%	6.03%	GM
How satisfied were you with the level of detail in your assignment feedback?	2.90%	7.25%	15.94%	40.58%	26.09%	7.25%	iA
	4.31%	9.48%	13.79%	41.38%	25.86%	5.17%	GM
How satisfied were you with the way the feedback was delivered (using comment boxes, circles, text and other annotations)?	2.90%	7.97%	13.04%	36.23%	31.88%	7.97%	iA
	4.31%	10.34%	12.93%	31.90%	33.62%	6.90%	GM
Part 2: Comparison	Much worse	Worse	About the same	Better	Much better	Unanswer-ed	
How does your experience of receiving feedback using Grademark/iAnnotate compare to your experience of receiving paper-based feedback?	3.62%	15.94%	27.54%	29.71%	14.49%	8.70%	iA
	5.17%	16.38%	22.41%	25.86%	23.28%	6.90%	GM

iAnnotate n=138; Grademark n=116

Table 2. Full comparison of survey items for Grademark (GM) and iAnnotate (iA)

In order to compare the means of the two groups the Likert scale responses were given a numerical value ranging from 1 to 5 with 1 being very unsatisfied/much worse to 5 being very satisfied/much better. Mean comparison and p values for each group are listed in Table 3. There were no significant differences on any of the above comparisons: results consistent with no population differences between Grademark and iAnnotate. The satisfaction on these measures is effectively the same for the two marking methods, and at a moderate level.

	iAnnotate		Grademark		
	n=138		n=116		
	Mean	SD	Mean	SD	p value
How satisfied were you with how quickly your assignment was marked and feedback returned?	3.68	1.2	3.57	1.3	p =0.4650
How satisfied were you with the level of detail in your assignment feedback?	3.58	1.41	3.59	1.36	p = 0.9521
How satisfied were you with the way the feedback was delivered (using comment boxes, circles, text and other annotations)?	3.61	1.48	3.58	1.49	p = 0.8666
How does your experience of receiving feedback using Grademark compare to your experience of receiving paper-based feedback?	3.09	1.41	3.25	1.47	p = 0.3561

Table 3: Comparison of group means

Reflections on eMarking

Responses to the open question at the end of the survey provide insight into the impetus behind students' seemingly contradictory assessments. In the final section of the questionnaire, students were asked 'Would you like to make any comments to elaborate on your ratings?' Overall, students described a preference for electronic submission, but for the format of feedback to mirror that received in paper-based format. There were few differences in students'

reflections on eMarking in Grademark and iAnnotate, so themes for each survey are presented together. The five themes emerging from analysis are presented below: convenience, page-by-page marking, permanence, insufficient feedback and unfamiliar skill.

Convenience

Participants described both eMarking tools as convenient, commenting that online submission prevented the need to travel to campus to submit their work, saving them time. Three participants stated that using iAnnotate meant they were receiving feedback in an efficient and convenient manner. Students made similar comments about Grademark, describing it as 'fantastic,' 'fast and easy to use' and 'instant.' One participant elaborated saying, Grademark gave me 'instant access to… grades and comments as soon as they were available.' Another emphasised its convenience: '[I could access feedback] at a time that was convenient to me.'

Page-by-page marking

In comments, students expressed preferences for page-based feedback, where comments are offered on the same page as the related text. In comparisons of the two eMarking tools, Grademark was described as allowing for slightly more page-based comments. In Grademark, markers added brief comments in the margins or created comment boxes that would open up when students dragged their curser over them. The rubric is contained in a different section in Grademark, where markers can provide overall comments in written or audio form. Students' experiences with comments in Grademark were mixed. Two found viewing comment boxes difficult. Another stated: 'it was good [easy] to see what was wrong with the assignment because the exact issues were highlighted and had comments relating to each one.'

In iAnnotate, the need to save annotated .pdfs as 'flattened' files before uploading, meant comment bubbles were not visible on the page where they were made. A number, associated with page and comment order, directed students to see associated comments at the end of the file. While students considered the feedback helpful and clear, six students described scrolling to the end of their assignment to view the coded feedback as cumbersome and inefficient.

> Comment boxes were difficult to follow because each number indicated an improvement or general comment. It would be easier if [they could] be made on the same page, perhaps in the outer margin.

> The only problem I found, was that when there was a little bubble telling us that something wasn't great, we had to scroll all the way to the bottom, read the comment, then scroll up to the top again.

Three participants indicated this as the reason behind their preference for feedback in hardcopy.

Permanency

Two participants expressed concern about not knowing how to keep a permanent record of their assignment feedback in Grademark or iAnnotate. They wanted to save their feedback so they could reflect back on it to improve future assignments.

I do not recall receiving information on how to save marked essays for future reference. That way I could pick trends in my writing style, repeated mistakes in referencing or ideas that did or did not go well.

Insufficient feedback

Several participants assessed eMarking as an insufficient medium for feedback: 'not detailed enough,' and 'significantly less than [what would be provided in] paper marking.' In contrast, another student suggested there be more interconnectivity in feedback, with hyperlinks: '[feedback should] elaborate more on how paragraphs should look… maybe give a url link.' Yet another wanted more feedback, but questioned whether this need was a reflection of the medium or marker: 'I feel there was less feedback than paper marking, but [it is] difficult to compare as different markers have a different level of commenting on assessments.'

Unfamiliar skill

Participants communicated difficulties in becoming confident in using vUWS, iAnnotate and Grademark to retrieve feedback. One participant described the process as 'overly complicated,' with 'too many folders.' Another commented that is was 'difficult to navigate vUWS, to see specific marks allocated on the rubric' and that 'clearer instructions on how to view the feedback, [and] rubric might be beneficial.' Another student stated: 'I found it hard to actually find where I should go to see the marking, so it took me a little while to find all the comment[s].'

Students who felt more competent at retrieving their feedback and saving or downloading an electronic version of their marked assignment through iAnnotate or Grademark were more positive about eMarking: 'It is just as effective if used correctly, with highlighting to target key areas to comment on.' One participant was positive, alluding to the ease of reading comments without having to decipher the marker's handwriting.

I love it! So long for hard copy submissions! Easy to understand, and you can save the completed and marked assessment as a pdf file and store it digitally rather than holding onto paper copies. Much more effective. No questioning over what has been written as feedback. Hopefully all the other units will follow suit.

Discussion

This study into students' use and perceptions of eMarking responds to calls within the literature (Li & De Luca, 2014) for further research into TEL and assessment feedback. It also responds to our needs, as lecturers, for information on which to base decisions about the management of marking and feedback in large first year first semester subjects where, arguably, timely, and high quality feedback on assessments is pivotal to student transitions and success. In particular, low rates of hard copy feedback retrieval suggest the need to reconsider feedback methods.

Our study suggests the value of introducing eMarking to achieving improvements in the number of students accessing their feedback on assessments marked after the end of semester. Close examination of analytic data on the online course management platform, however, confirmed past research (Bailey, 2009) and fears that few students were closely examining their feedback. While a minority of students were found to spend between thirty and fifty minutes, most spent only a few minutes reflecting on their feedback. Readers should note that these

numbers are indicative only. Students may have downloaded their assessment feedback and reviewed it at length offline. Alternatively, student could have left their assessment feedback screen open on vUWS while viewing other screens. While not a true measure of the amount of time spent viewing feedback, we are hopeful that, on balance, the figures are suggestive.

Results further indicate widespread approval of eMarking. A comparison of the two eMarking platforms showed no statistically significant difference in student satisfaction. However, results could have been affected by our request to ask students to complete similar surveys in both subjects. Transferability to other student populations should be judged based on students' demographic characteristics and open comments. Only half of the students reported a preference for feedback through eMarking over paper-based feedback. Thematic analysis of open-ended comments suggests that while students appreciated the convenience of online submission and the ease with which they could access feedback online, there are many challenges to navigating the online systems to access feedback. Compared with paper-based marking, eMarking was reported to foster less page-by-page feedback. eMarking was also described as lacking permanence; feedback was not easily saved and retained for further reflection. Compared with paper-based marking, therefore, eMarking was found to be lacking because of the processes involved in retrieving marks online, a lack of familiarity with the online learning platform, and challenges associated with computer literacy.

These findings do not suggest inherent failures in Grademark and iAnnotate. They suggest 1) an opportunity to use TEL to encourage further student engagement with feedback, 2) a need for changes in how markers use eMarking tools; and 3) a need to guide students in navigating online learning platforms. Markers should be instructed to insert comments in-text, directly on the page, to reduce the need for scrolling. This can be facilitated through the 'typewriter' feature in iAnnotate, and by guiding students to view Grademark comments online, rather than in print format. Finally, lecturers of first year subjects might be persuaded to offer students basic instructions in submitting, accessing, reflecting and saving eMarking feedback as another possible means of improving student satisfaction with eMarking. Despite apparent proficiency with social media, lecturers should be reminded that students begin their university studies with varied skill levels in computer literacy (Hindi, Miller, & Wenger, 2002). Some may find online learning systems intuitive while others find them perplexing. Future research should investigate strategies to fostering more in-depth student engagement with feedback. Self-assessment, using the rubric, at time of submission might foster such engagement, encouraging students to compare self and tutor feedback. Scaffolding provides another strategy. Further research should prioritise the investigation of the impact of these and other strategies at improving rates of feedback retrieval, review and retention. As the existing scholarship suggests, a holistic view which takes student and tutor reflections into consideration is warranted.

Conclusion

In this exploratory study, we examined students' engagement with and perceptions of eMarking in two first year first semester health science subjects. We offer insight into the possibilities of eMarking, such as increased convenience, the improved legibility of comments, and greater access to and reflection on feedback. We also unpack challenges associated with eMarking, contributing to the burgeoning literature on assessment feedback in higher education. Where possible, we show that eMarking feedback should mirror paper-based feedback in the use of in-text corrections and comments, and in the capacity for feedback to be retained for future reflection. In an increasingly time-poor, but student satisfaction hungry university landscape, the timing and quality of feedback on assessments is of growing importance. This paper offers lessons learnt for maximising the potential to reap the benefits of TEL and eMarking.

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