Understanding students' views on feedback to inform the development of technology-supported feedback systems

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In an increasingly expanding higher education system, students have routinely said that they don't get enough access to feedback to support their learning. While this feedback loop is recognised as a critical issue, the growing use of technology as part of teaching and learning could provide some solutions to this problem. The emergence of the field of learning analytics has the potential to provide mechanisms for reducing some of the concerns students have about receiving feedback. However, a greater understanding of how learning analytics can be used to provide meaningful assessment feedback to students is needed. This paper presents the initial findings from a study that investigated students' preferences for the delivery of assessment feedback to improve their learning. The findings show that there is a diversity of student perspectives on what feedback is most useful for their learning which is influenced by the type of assessment, the discipline in which the assessment takes place, the year level of the student and the ability to compare performance to others. The outcomes of this study provide evidence of what students want when it comes to analytics-based feedback which can be used to inform the development of guidelines for how such feedback can be designed and delivered in higher education.

Introduction

There are many ways that technology can be used when providing feedback to students. Recently new developments, often based on learning analytics, are being developed in order to be able to provide better and more personalised feedback to students in higher education. These technology-supported feedback systems may focus on a single assessment/task, or may offer a high-level view of engagement and/or performance across several assessments/tasks. The use of dashboards is becoming increasing popular to deliver this form of feedback, especially as part of learning management systems. The emergence of such tools for feedback delivery provide new opportunities to represent feedback in meaningful ways for students, but in order for this to occur the design needs to be based on established understandings of the principles of effective feedback.

While there is an existing, extensive array of literature exploring what constitutes effective feedback for student learning, there has been less consideration of how this feedback could be delivered through technology-based tools such as dashboards. Instead questions have been raised about the design and impact of these forms of feedback representation can have on students' motivation and approaches to study (Corrin & de Barba, 2014; Teasley, 2017). Additionally, most studies of students' perceptions of feedback are often conducted at a single point in time, requiring students to reflect on a single, specific assessment type or on feedback in a fairly general sense. There are very few studies that adopt a sustained approach to understand students' feedback preferences over time. In order to be able to develop effective technology-supported feedback systems we need to understand not only what students want and value - but how this changes and evolves over time. This paper reports on a study that seeks to explore students' perspectives on feedback across assessment types and time to inform how technology can be used to support the provision of feedback most effectively.

Background

Feedback is defined as "information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding" (Hattie & Timperley, 2007, p.81). The importance of feedback for student learning has long been recognised (Black & Wiliam, 1998). One critical aspect of the link between feedback and improved learning outcomes is students' ability to self-regulate their learning. High-achieving students use feedback as a catalyst for their self-regulatory processes (Butler & Winne, 1995). That is, these students are able to use feedback to assist them in setting goals, selecting the

most appropriate learning strategies to use, monitoring their own learning progress, and adapting to the learning tasks and activities they face (Pintrich, 2000).

However, while feedback is viewed as a valuable element of student learning, there have long been concerns over how useful students perceive the feedback they receive to be on their learning (Price, Handley, Miller & O'Donovan, 2010; Rowe & Wood, 2008). Recently, a large, cross-institutional study conducted in Australia (Baik, Naylor & Arkoudis, 2015) found that only 56% of surveyed students (n = 1,739) were satisfied with the usefulness of feedback given by their teachers. These findings clearly indicate there is room for improvement in relation to feedback practices in higher education so that students feel they are receiving adequate feedback on their learning.

Researchers suggest that it is not simply a matter of providing more feedback to students. Hattie and Timperley (2007) indicate "it is necessary to consider the nature of the feedback, the timing, and how a student 'receives' this feedback" (p. 101). Boud and colleagues (2010) suggest specific information that can help students to improve the quality of their work needs to be provided, not just a mark or grade. Moreover, students often regard the *personal* nature of feedback from lecturers and tutors as particularly valuable (Pokorny & Pickford, 2010).

The study reported in this paper was designed to build on the findings of previous feedback research by investigating a greater level of detail about the types, format and timing of assessment feedback as it relates to personal analytics. By personal analytics we refer to information that is customised and delivered to students about their own performance and activity through technology. The study was undertaken across a whole semester to gauge what assessment feedback would be useful at particular points in time. It focused on the meaningful ways assessment data can be presented to students so that they can modify their study approaches to enhance learning outcomes.

Method

The study was guided by the following questions: (1) What type of feedback do students want to receive? (2) At what level of granularity do they want this feedback? (3) What form do they want this feedback to take? (4) When would they like to receive the feedback? and (5) How often would they like to receive feedback? The findings presented in this paper relate primarily to the first two of these questions. A multiple case study approach was adopted including a sample of 30 students recruited from across different disciplines and undergraduate year levels at the University of Melbourne. This diverse sample enabled the examination of any

differences in students' perspectives of the type and usefulness of feedback across the different stages of study. The participants were asked to participate in four interviews at different points throughout the semester. The first interview investigated students' initial definitions and expectations regarding the provision of feedback on their learning. In subsequent interviews, we explored how these perceptions and expectations changed over the course of the semester within the context of the types of assessments participants were undertaking and feedback they had received. Case summaries were prepared for each participant bringing together the main themes and elements of each individual case. A cross-case analysis was then conducted to identify the emerging themes that are presented in this paper.

Findings and discussion

In this work-in-progress paper, we present the emerging findings from the study which focus on four main themes: (1) the inconsistent understanding of what feedback is; (2) the differences in perspectives on feedback across different year levels; (3) the feedback for different types of assessment designs across different disciplines; and (4) the ability of students to compare their assessment performance with others or to a particular standard. Each of these themes will be considered in more detail below.

Students' understanding of feedback

There was diversity across the understandings about what constituted feedback among the student participants. While many focused on the output of a mark or grade, others highlighted the comments provided on written work or the provision of the correct answers and related justification to multiple choice tests. When talking to students at the beginning of semester to find out what they would like to receive in the future, many students expressed a preference for face-to-face discussions with teachers to go through the exact issues with their individual work (e.g. one student requested: "I wish that there is a period both before and after the essay that the tutors or lecturers will be open to students so that the student ... could discuss the problem with [their] essay" (S02)). Alternatively, students tended to request feedback of the kind they had received and liked most recently in previous educational settings/semesters. Interestingly, a large proportion of students requested feedback on their progress through assessment tasks in the semester - a way to track what they had completed so far and what was still to come.

Early in semester students commonly wanted clarification related to the assessment design and expectations, prior to submission, rather than just results at the end. In the context of self-regulated learning this relates to the concept of task interpretation (Butler & Winne, 1995). Students wanted pre-task feedback to understand the

expectations of the task. For example, one student suggested "if they could do practice questions [that] would allow us to observe how they want us to write and how they want us to structure the answer, so that we can write an answer they want to see" (S03). A few students also requested past exam papers or exemplars of student work so that they could understand the way a particular teacher wanted the assessment to be completed.

Over the period of the semester requests for assistance with task interpretation often expanded into requests for changes to assessment design to allow for more frequent feedback opportunities. For example, a larger task being split into smaller ones on which the students would receive feedback to feed into the next part. This was common among those students who had a large number of assessment tasks that had submission dates towards the end of the semester. These students were concerned about submitting such a substantial assessment piece without a clear sense of whether they had fully understood the task requirements. The issue of providing feedback on task preparation is an interesting one for designers of assessment feedback systems. It is common for tools such as dashboards to focus on the outcomes of completed assessments, but less emphasis has been placed on ways to build in support for task interpretation and progress. It is possible that learning analytics could be used to provide pre-assessment feedback by presenting summaries of previous cohorts' feedback. The provision of pre-assessment support can also be built into the learning design of assessment activities and factored into how these activities are represented in the LMS.

Feedback perspectives across year levels

Students from different year levels reported various needs and strategies to get feedback during the semester. First-year students mentioned their previous experience in high-school as their benchmark on what to expect to how they would receive feedback in university. For example, one first year student mentioned "Maybe we could have smaller tests or I don't know because I'm used to high-school topic tests" (S06). By the end of the semester, first year students mentioned they were satisfied with some of the feedback received, although it did not often include face-to-face time with teaching staff. They also noticed the need to be more proactive in order to get feedback in subjects with large cohorts. This involved interacting with peers and looking up for extra resources to receive feedback rather than solely relying on teaching staff. On the other hand, the majority of third year students reported from the outset that their strategies to get feedback during the semester revolved around their peers and the curriculum, rather than only on teaching staff. This included strategies such as participating in study groups, peer review processes, and accessing past exams. For example, one student stated

about participating in a peer review process: "I was able to see a student who was above me and what they had done and what they had included and I was able to look at mine and think oh ok, so if I had done that, I could've made this much better" (S10). Face-to-face time with teaching staff was mainly perceived as a last resource for feedback provision.

Overall, these preliminary findings suggest that across their undergraduate years students move from a position where they expect to receive one-on-one feedback mainly from teachers (and initiated by teachers themselves), to a position where they create their own opportunities for feedback, relying mainly on their peers and resources rather than on the teaching staff. From a self-regulated learning perspective, this means students are being required to adjust their strategies to seek help and learn from their peers to fit into a new learning context (Pintrich, 2000). Consideration for how assessment and feedback can been designed to better support this transition is important, especially in relation to how technology may play a role in supporting large classes in earlier years at university. For example, personalised tips could be built into feedback representations (e.g. dashboards) to suggest additional or alternative ways that feedback can be sought if students feel that what they have been provided with is insufficient.

Different types of assessment across disciplines

Not surprisingly, it was quite common that different assessment types were favoured in different disciplines. Some disciplines had very similar patterns of mid-semester and final exams (science/business) or mid-semester and final essays (Arts). Of course, there were exceptions to these patterns within these faculties, where different assessments were incorporated to match the content of particular subjects or as an initiative of an innovative teacher. Overall the variety of assessment designs was quite extensive across all 30 student participants. A theme that emerged across a large number of student cases was that there was sometimes a lack of alignment between the assessment tasks throughout the semester and the final assessment. Students comments on this in relation to their response to feedback as they were less likely to engage with feedback given if it had little impact on the final assessment.

A feature of the University in which this study took place is the requirement that students undertake a subject each semester from a discipline outside their major discipline. While this exposes students to a broader range of content, it also exposes them to a broader range of assessment types. When talking about the assessments they were required to do in their non-core subjects,

students tended to ask for more guidance on the requirements and expectations for the task prior to submission. They were also faster to justify lower results in these subjects as an outcome of their lack of familiarity with the assessment design. The ability of students to move between disciplines, and sometimes even between institutions, is increasing in the higher education environment and this too must be taken into consideration when developing feedback systems that can cater for a vast array of assessment designs. Potentially this may require the design of different methods of support for students who have different levels of familiarity with assessment types common to core vs. elective subjects.

Comparison of assessment feedback with peers and/or a standard

A common theme across most cases was students' request for feedback that would allow them to compare their performance with their peers. However, students were somewhat ambivalent about how effective that comparison would be to help improve their learning. Some students perceived comparison with peers a way to feel better about their own performance. For example, one student said "some assessments may be harder than others. And if you, say, had a very difficult lab as your first lab, and you have multiple labs, then you might bring your confidence down, unless you knew that other people also had trouble, so at least I'm on their level" (S03). Others mentioned the negative impact this would have in their motivation if their grade was much lower than the class average. Another student raised concerns about the potential promotion of competition amongst peers, which could be detrimental to students' collaborative relationships. An alternative a few students raised to deal with the disadvantages of comparing students with their peers was for group level feedback to be delivered to the whole class. According to one student, a presentation at the beginning of a lecture or tutorial highlighting points of the assignment that most of the class went well or that needs improvement should be enough to allow him/her to identify where he/she sits in comparison to peers and what he/she needed to do to keep up with the class.

A few students mentioned that rather than comparing their results with their peers, they wanted to receive feedback that provided them comparison with predetermined standards. This includes, for example, providing exemplar answers to open-ended questions. As one student said, "that way I can pinpoint what I can focus on because looking at the questions and answers back I can see what I would be thinking at the time that I was going through the steps and if I agree or disagree or find some sort of mistake in my thinking" (S03). In this way, students would be able to use these materials as a source of formative feedback when preparing for their

assignments. The literature, to date, has not provided any definitive answers about the best method for offering comparisons as an element of feedback. How this could be incorporated in technology-support feedback systems and the extent that students could potentially choose their preferred standard are challenges still to be addressed. Although the benefit of providing a standard to assist students in monitoring their learning has been identified as an important element in support students' self-regulation of learning (Butler & Winne, 1995; Pintrich, 2000).

Conclusion

From the outcomes of this study so far, the wide variety of perspectives on feedback and preferences for how and when it is delivered confirms the difficulty of being able to develop a "one-size-fits-all" feedback system (Teasley, 2017). Not only do preferences vary across assessment types, but the expectations of feedback evolve over time as students progress through their studies. While this doesn't mean that systems such as dashboards can't be used for feedback delivery, it does mean that important design decisions need to be made in order for such tools to provide flexibility and benefits to students learning. The impact of assessment design on representations of feedback needs to be reflected in the design of any technology-support feedback tools. While there has been recognition of the role of learning design in teachers' interpretation of learning analytics data (Bakharia et al., 2016), more needs to be understood about how students can be supported to match the designs of their assessments with the feedback provided. It was clear from this study that while some students were able to use their understanding of the assessment design and purpose to interpret feedback and transform this into future actions, others struggled to make this connection. A better understanding of this relationship could inform alternatives to improve assessment feedback delivery to students.

The emerging themes presented in this paper demonstrate the complexity of designing and delivering effective feedback to support student learning. It is important to note that decisions around feedback provision shouldn't be based only on what students want. Teachers have a responsibility to determine when feedback is necessary to support learning and how this can be delivered in a way that it is received by students (Hattie & Timperley, 2007). Consideration of the tensions between assessment design and learning practices is also necessary to ensure that what is assessed and how it is assessed aligns with the learning outcomes. While this research was undertaken at a single institution, the data gathered on students' perceptions of feedback can be transferable across the higher education context. It is hoped that the outcomes of the broader study can be

used by universities to inform institutional learning analytics initiatives around student feedback and/or tool development. The diverse findings highlight that there are many factors that require further consideration in order to design effective personal analytics solutions for students.

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