

The role of instant feedback in improving student understanding of basic accounting concepts

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An Accounting Practice Set that provided immediate feedback was developed in an attempt to accelerate the acquisition of accounting skills by students. A number of metrics were used to measure student engagement in the practice set and to measure if students did acquire accounting skills more rapidly. While results to this stage are still preliminary, through the analysis of Phase One it does appear that many students can gain significant benefit from the practice set. However, there are still a portion of the students that have not engaged.

Keywords: Adaptive training, feedback, feedforward, formative assessment

Introduction

Basic accounting skills are not always easy to acquire, as evidenced by the history of high attrition and failure rates in the University of New England's (UNE's) introductory accounting unit (subject). Anderson and McCrea (2005) revealed that in 2004 the attrition rate in AFM101 (Introduction to Financial Accounting) for external students (students studying by distance) was 61%. This attrition can be significantly reduced and overall student engagement with the material can be greatly increased by creating an environment better aligned to student learning. While many models could better facilitate student learning, the significant literature on feedback indicated that an 'Accounting Practice Set', with built in instant feedback, could enable many students to more deeply engage with basic accounting concepts. The development of the practice set also used principles of gamification (making non-game applications more engaging by applying game-design thinking) and flow (when someone is immersed in an activity providing them with feelings of energy and focus), but these items will not be the focus of this article.

An 'Accounting Practice Set' is an attempt to replicate what happens in practice. Students are provided with the basic accounting records and a list of transactions and are asked to prepare the financial statements for a case study business. This provides students with the opportunity to get a feel for how accounting works while at the same time exposing them to the core elements of record keeping. At UNE, this has long been used as a summative assessment task and typically students report this as being one of their most valuable learning resources for the unit.

In order to build on this strength, the practice set was turned into a formative assessment task and assessed indirectly by two practice set quizzes. According to Curtis (2011) accounting educators can improve students' ability to learn by using formative assessment to improve students' metacognition and as Schleifer and Dull (2009) found, students with higher metacognitive abilities are also likely to have higher performance in accounting subjects. Reported in this paper is Phase One of the project.

Feedback and feedforward

The need for feedback is hardwired into humans and decoding and responding to feedback is part of the human survival story. Cannon (1929) suggests that in order for an organism to survive it must be "capable of modifying itself according to external stimuli and adjusting its response to the stimulation" (p. 399). Wiener (1954) highlighted that "it is the aim of feedback ... to produce a temporary and local reversal of the normal direction of entropy. And thus free the organism to progress" (p.24). Removing the direct assessment aspect from the practice set enabled a significant increase in both feedback and feedforward to students.

The role of feedback in modifying our behaviour is especially true in the learning environment. It "plays a

decisive role in learning and development, within and beyond formal educational settings. We learn faster, and much more effectively, when we have a clear sense of how well we are doing and what we might need in order to improve” (Hounsell, 2003, p. 67). Feedback has been described as “the most powerful single moderator that enhances achievement” (Hattie, 1999, p. 9).

Sadler (1989), Hattie (1999) and Nicole and Dick (2006) highlight characteristics of good feedback that include identifying the desired outcome, comparing actual performance to the desired outcome and providing a guidance to bridge any gap identified. Hattie (1999) also highlighted the importance of having a task that was sufficiently challenging. When discussing the role of flow in enhancing learning, Csikszentmihalyi (1990) built a similar list to this but did add that the feedback needed to be immediate.

The ‘Accounting Practice Set’ attempted to harness the power of feedback in four key ways:

1. Cells turn green when a correct entry is made;
2. Each page contains a progress metre that informs the student of the percentage completion of their current task (e.g. the Special Journals) and of the practice set as a whole;
3. A progress report that details the student’s progress on each task, in terms of the number of steps completed compared to total steps involved for the particular segment of the task. This progress report is supported by a progress dashboard that provides a visual representation of the progress; and
4. A leaderboard is displayed on the learning management system (Moodle) so that students can compare their performance with others. This progress is based on self-reporting and only displays the top students.

The Practice Set project also provides significant feedforward. This comes in the form of 28 videos that walk students through each step of the process. The practice set has a few other significant advantages because it has features of gaming, adaptive training systems and it is an authentic activity.

Preliminary results

The first trimester under this system has just been completed (2014) and the process of analysing the success of the project is still in its early stages. While results to this stage are encouraging, they are not conclusive. The project is currently being rerun in Trimester 2 building on learnings from Trimester 1. A detailed analysis of the data from Trimester 1 is currently being undertaken. However, there was one significant and unexpected result which has the likelihood of changing the direction of the research. It appears male students are more likely to engage and benefit from the practice set than are female students.

The impact of the program can viewed through a number of metrics. Below are the headline results from some of these areas.

Video views

Twenty-eight videos supported the practice set. There was 64,996 minutes of viewing in total from 8,266 video views. This represents 264 minutes and 34.5 views per student – based on students enrolled at census date. This is a slight understatement of views as some students downloaded the videos (and so this is not counted in views) and some students watched the videos from a different source (related to not having access to the videos in the country in which they were located).

Percentage of practice set completed

Students were asked to self report their completion of the practice set as the first question in the practice set quiz which was conducted in week 9 (out of a 12 week trimester). On average, they had completed the practice set 1.15 times. This number probably increased 20 to 30% by the end of trimester.

Student grades compared to previous years

The analysis at this stage is at a rudimentary level. In particular, it has not taken account of changes to the student cohort that are measured. These include degree studied, prestart diagnostic tests (math quiz and representational systems biases test) and repeat students. Table 1 shows a comparison between average exam marks in Trimester 1, 2012 (our first year of trimesters) and Trimester 1, 2014. This analysis will be developed considerably over the coming months in an attempt to ensure that the comparison is like with like.

Table 1 reports the average mark in final exam for Trimester 1, 2012 and Trimester 1, 2014. This mark is the average mark for all students enrolled at the date of the exam and students that did not sit the exam are included with a mark of zero.

Table 1: Student mark out of 100 in final exam

Teaching Period	Male	Female
2012, Trimester 1	49.8	53.1
2014, Trimester 1	58.9	56.7

Student communication

Many students sent emails throughout the trimester that discussed the unit and, in particular, the practice set. These emails were not totally unsolicited. Interview volunteers were sort to discuss how they used resources in the unit and, it is likely that many students were indirectly responding to this expressed interest. The following excerpt from a student email does highlight some of the common themes.

I loved it! It was really handy to have a ‘practical’ experience using the knowledge you’re learning. The progress reports were great so you could see exactly where you went wrong.

Questionnaire responses

Each student was sent a link to an online survey after the exam had been completed. Out of the 200 students still enrolled when teaching was completed in the trimester, 44 useable responses were completed. One of the questions asked students to rate the contribution to their learning of the resources that were made available to them. Students could give a score from 0 to 100 for each of the 10 listed resources. The two highest ranked resources were the practice set videos (88.5%) and the practice set (86.2%). This compared favourably with the topic notes (77.3%) and the text book (63.8%).

Student interviews

Students were asked to indicate if they were willing to participate in an interview regarding their use of the practice set. Interviews were then arranged where possible. As it was during the exam period, it was only possible to have interviews with about half the students that volunteered. A total of 13 students were interviewed. While many students provided suggestions for improving the practice set, they were all positive about its value. However, these were generally students that excelled and while their feedback is valuable, it is not likely to be representative of the total student group. The two most consistently reported positive features were: 1) cells turned green providing the reinforcement that the student was on the right track and 2) the practice set as a whole provided a mechanism to better understand how accounting fitted together.

The most commonly reported weaknesses related to when cells that should have turned green did not and the uncertainty that this created.

Limitations of the study

Many students are engaging with the practice set and gaining great benefit from this. However, there is group of students that did not engage with the practice set. For instance, 26 students reported completing less than 45% of the practice set. Not only are these students not participating with the practice set but they are also not participating in the interviews or surveys and so their views are underrepresented. Only 10 of these students passed the final exam. A mechanism to engage or at least understand these students needs to be developed.

Further research

The work that has been done so far indicates that this is a worthwhile project to explore and so has laid a valuable foundation upon which to build. The immediate next steps are to implement lessons that have been learned from Phase One of the project and then to conduct a deeper analysis of the Phase One data.

Conclusion

This research indicates that some students are likely to deeply engage with an accounting practice that provides immediate feedback to them. As a result, they will acquire accounting skills more quickly and most probably at a deeper level. However this model does not appeal to all students equally and a mechanism needs to be developed to identify and support the students that are less engaged with the new approach.

The introduction of the practice set has corresponded with a period in which the performance of the male students in the cohort has improved significantly, both in terms of average marks and representation in the top ten students. However, to this stage no causal link has been established.

The students that are most likely to engage with the practice set most fully will be male, score well in the diagnostic math quiz and have auditory digital as their primary representation system.

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