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Transforming student expectations through a real-time feedback process and the introduction of concepts of self-efficacy – surprising results of a university-wide experiment

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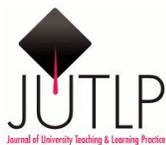
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Keywords

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Introduction

High grades may often be equated with optimal student-learning outcomes (Gijbels et al. 2005) or the application of deep-learning approaches (Biggs et al. 2001). However, students and employers also view grades as a form of capital (Lynch & Hennessy 2017). In another sense, when grades are aligned correctly with the required student attributes of a unit of study, they can be considered a good representation of the student's ability to learn at a certain level (Biggs 1996), or, more simply, a good way to measure a student's level of cognition (Borghans et al. 2016).

While relationships between grade outcomes and a student's performance are important, they rely on a precursor condition in the student, a certain level of self-belief in one's ability to perform a certain set of specific, as yet unknown, academic tasks; in short, in one's sense of self-efficacy (Bandura 1977). In this paper, we examine a way teachers can support students' development of their sense of self-efficacy. The study is premised on the notion that the student needs to have an explicit awareness of self-efficacy early in their learning, and thus it is contingent upon the teacher to support the development of that awareness effectively very early. Here we present and evaluate the effectiveness of a specific method, point-of-contact feedback, in lifting students' awareness of self-efficacy, and we demonstrate the capacity of the point-of-contact feedback method to raise awareness of any learning concept, practice or value. While it may appear that the primary focus of this study is on self-efficacy *per se*, it is actually on the application of a method for helping students engage with an important learning idea, practice or value. In this case, given the importance of self-efficacy in academic performance, the application of self-efficacy concepts acts as a means to demonstrate how point-of-contact feedback can be used to deliver and enhance specific content. To effectively evaluate the effectiveness of point-of-contact feedback in the context of this study, however, some background on the function of self-efficacy is also required.

Self-efficacy and academic performance

As early as the late 1970s the concept of self-efficacy had been identified as a driver of success (Bandura 1977). The concept's champion, psychologist Albert Bandura, claimed that "... efficacy expectations are a major determinant of people's choice of activities, how much effort they will expend, and of how long they will sustain effort in dealing with stressful situations" (p. 194). His seminal 1977 paper drew on evidence demonstrating the positive role of self-efficacy in enhancing social skills, career choices, assertiveness, the ability to cope with feared events and, most importantly, academic achievement. He indicated that perceived self-efficacy is centred on people's beliefs in their capabilities to produce given results; the role of personal agency is important in ensuring that individuals operate successfully within a "broad network of sociostructural influences [and] people are producers as well as products of social systems" (Bandura 2001, p. 1). Bandura and colleagues have since worked on developing a detailed understanding of the concept and process of self-efficacy (e.g. Bandura & Walters 1977; Bandura 1994, 1997, 2001, 2006; Bandura & Locke 2003). Many others have expanded the study of self-efficacy since Bandura's introduction of the concept, and the concept has been applied widely. Studies have examined the role of self-efficacy in areas such as academic performance (Robbins et al. 2004), dietary behaviour (Povey et al. 2000), smoking cessation (Conner & Norman 2005), sports performance (Owen & Froman 1988) and work behaviour (Stajkovic & Luthans 1998). Researchers have also recognised the importance of a direct, causal relationship between academic self-efficacy and academic performance (Zimmerman et al. 1992; Gerdes & Mallinckrodt 1994; McKenzie & Schweitzer 2001; Gore 2016; Whannall & Whannall 2014). Nevertheless, there are mediating and moderating factors such as cognitive processing strategies, effort regulation,

personality, past performance, self-regulatory learning strategies and goal orientation (Csikszentmihalyi 1997; Jernigan 2004; van Dinther et al. 2011; Honicke & Broadbent 2016).

The basic premise concerning the importance of self-efficacy in academic performance is that those who perceive themselves to be highly efficacious (that is, successful in producing a desired or intended result) are more likely to produce positive outcomes, due to the activation of sufficient effort (Bandura & Walters 1977; Schunk 1983, 1990; Rubie-Davies et al. 2010). In contrast, when faced with situations that seem threatening but are in reality safe, some students are more likely to distrust successful experiences, and thus retain incapacitating expectations and fears that result in defensive behaviour. In short, a strong sense of self-efficacy may support positive behaviours, while a poor sense of self-efficacy may reinforce weak behaviours (Schunk 1983, 1990). In practical educational terms, confident students typically take control over their own learning and engage in university (Gerdes & Mallinckrodt 1994; Lee et al. 2014), and students' belief in their own performance has been shown to be a predictive factor of what university grades they achieve (McKenzie & Schweitzer 2001; Gore 2006; Whannall & Whannall 2014).

Embedding in higher-education teaching and learning the notion that a student's sense of self-efficacy may influence their academic behaviour, and therefore achievement appears to be an obvious way to contribute to the transformation of students' academic performance. Actively promoting self-efficacy also serves to promote metacognition and self-regulation through the sharing of knowledge about self-efficacy, and to lift levels of self-efficacy in academic pursuits. Importantly, it helps students understand how sources of self-efficacy, such as mastery experiences, often occur without the student necessarily being aware of their role in developing self-efficacy (Figure 1). When knowledge about self-efficacy is shared, the implicit is made explicit, and students are encouraged to become more autonomous in their learning (Espasa & Meneses 2010).

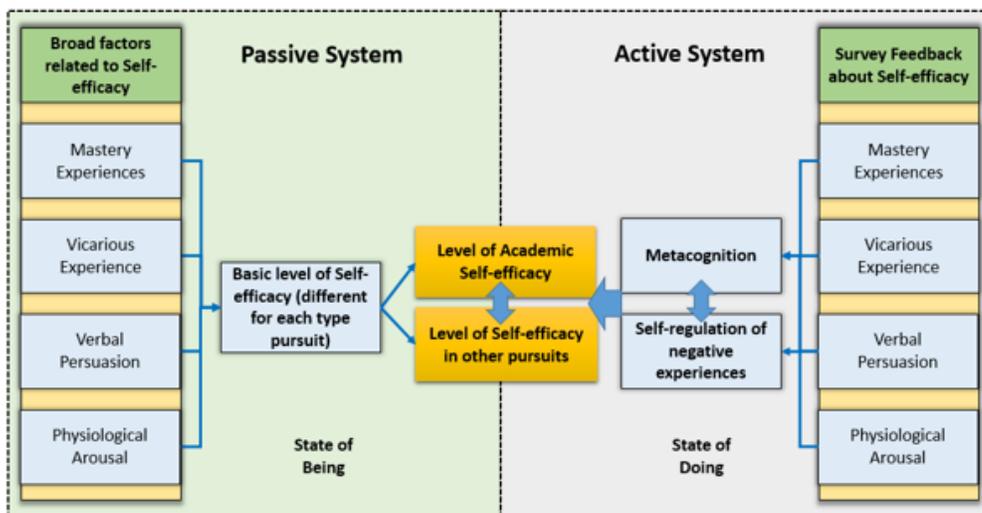


Figure 1. Model of self-efficacy feedback and its relationship to both passive and active systems of self-efficacy attainment

An experiment in helping students improve their awareness of academic self-efficacy

This paper reports on an experiment examining the possibility that students can be assisted in improving their awareness and understanding of a learning concept, in this case self-efficacy, and examines the effect it may have on their academic performance. In doing so, and especially in assisting students to articulate their understanding of the concept (of self-efficacy) – articulation of concepts is often difficult – the experiment uses a behavioural proxy or signifier of the concept of self-efficacy: the student's self-declared statement of their *expectations* of academic achievement in the coming teaching period. In short, students were asked to declare the grade that they *anticipated* achieving in the coming teaching session. In the experiment, a change in a student's statement of anticipated grade was taken as a proxy for the level of their engagement with the newly introduced concept of self-efficacy. This is important, since the only student learning that can take place during the period of the experiment is an improved understanding about the concept and role of self-efficacy. This was the focus of this experiment at this stage; it would take a longer-term project to identify longitudinal relationships between early student understanding of the concept and performance outcomes such as retention rates or grades (Gerdes & Mallinckrodt 1994; McKenzie & Schweitzer 2001; Whannall & Whannall 2014).

To evaluate this experiment requires some measure of self-efficacy amongst the participants. Many tools have been used to measure a person's self-efficacy level (e.g. Sherer et al. 1982; Chemers et al. 2001). Bandura (2006), however, suggests that self-efficacy cannot generally be measured with any one tool, and that any such tool would have limited explanatory and predictive value to the specific domain of functioning. Furthermore, Bandura (1977) notes the range of ways people develop their efficacy, related to strengths and experiences in specific domains (for example, a sporting person might have high levels of self-efficacy in their sport, but lower levels of self-efficacy in academic activity). This experiment, therefore, uses a core indicator of anticipated academic success: student statements of anticipated grades before and after an intervention to introduce the concept of self-efficacy.

The experiment introduced the concept of self-efficacy to a large cohort of students at our own university – a typical public Australian university – using a point-of-contact feedback survey (Lake et al. 2017). Based on principles of social-persuasion design (e.g. Chiu et al. 2014; Singh et al. 2014; Oinas-Kukkonen & Harjumaa 2018), this type of survey has already been shown to work well in introducing students to new concepts in a variety of educational contexts (Lake et al. 2017).

Building on social proof and trust, consistency, incrementality, openness, unobstructiveness, utility and ease of use (Singh et al. 2014; Oinas-Kukkonen & Harjumaa 2018), the survey was used to assist students in improving their academic performance by asking them about their expectations of future grades and their understanding of the concept of self-efficacy. These questions provided opportunities to invite the students to further consider the concept of self-efficacy and to learn more about it. In keeping with all student surveys, the researchers collected data from the students, and so can report patterns of student expectations – this data collection allowed the researchers to evaluate whether there had been any significant shift in student understanding of the concept. However, unlike other surveys, the primary purpose of this survey was to provide real-time point-of-contact feedback to students – in other words, it simultaneously gave information back *to* the students rather than just taking information *from* them (Lake et al. 2017).

Using this real-time feedback process, the students were introduced to the concept (of self-

efficacy) very early in the teaching session. Considering the information students received throughout the survey, they were then immediately re-questioned regarding their academic expectations. By providing opportunity for students to complete the survey in the form of an efficacy concept tool, we were able to chart a significant change in students' expectations of their capacity for achievement.

While feedback is usually focused on assessing course quality, teaching, student assessments, learning resources, learning environment or other support services (Shah et al. 2017), the main focus of this experiment was to investigate how point-of-contact feedback could be used to promote a concept (in this case self-efficacy) and to change, in a short time, student expectations of their own performance. From a broader, education-wide or international perspective, the study also provides further evidence of the importance of using point-of-contact feedback to promote any idea, practice or value to students, thus enhancing teachers' ability to promote learning. In taking this approach, we support and promote Shah et al.'s (2017) idea that higher-education institutions should further investigate ways of effectively using student feedback to improve learning. Providing feedback in real time, as was the case in this study, is one potential method for increasing the power of surveys and using the feedback process more effectively.

Methods

The experiment comprised a survey distributed to all students at our university, using the 'All-students' email address. The university is a 23-year-old regional and rural university, with a predominately female (65%) student cohort, strongly comprising members of equity groups, notably regional and remote (74%), first in family (64%) and low socioeconomic (31%) students. Invitations to participants were sent to all students three times, approximately three days apart. The survey was approved by the university's Human Research Ethics Committee approval number ECN-16-175.

The survey was designed following the concepts of real-time point-of-contact feedback (Lake et al. 2017). Its purpose was to engage students in a discussion about their grade expectations for the coming teaching session (they were asked what average grade they expected to obtain), and to introduce the concept of self-efficacy as a means by which students may enhance their academic performance. The degree to which students responded to the new information – that is, whether they considered, during the short period they engaged the survey, that their attitude towards their own academic performance had changed – was tested through a reassessment of their anticipated grade.

The survey was attempted by 968 students, of whom 847 completed all questions. This represents more than 5% of the university's student population. With approximately 17,000 students in this university, the study has a confidence level of 99%, at a margin of error of 4.4%. The median age was 33 years (the university typically has 46.5% of commencing students over 25 years old).

Survey design

The full survey is detailed in Appendix A. The survey was designed to ask questions, to receive responses from participants (the standard survey approach) and to follow up participant responses with immediate, tailored feedback. It is this latter component that differentiates this type of survey design from conventional teaching and learning surveys (Lake et al. 2017). The first question asked what average grade students hoped to achieve across subjects that they were enrolled in

during the teaching session they were about to commence. This was followed by questions and feedback that focused on the concept of self-efficacy, its definition and its relationship with academic performance. The content was derived from published research regarding self-efficacy and academic performance (as detailed above). While all the feedback content could be referenced to scholarly literature, citations were removed from the version students received (Appendix A). Feedback was provided based on students' responses to each question prior to moving to the next question. An example of this approach is question 3 of the survey: "What is self-efficacy?" If a student selected "a) Belief in one's ability to succeed in specific situations or accomplish a task", a tailored output response was then displayed to the student after answering that question (Figure 2). If the student selected options (b) or (c), different output responses were displayed. The next question followed the feedback. The same logic was followed for all the questions, except those that focused on anticipated grade or demographic aspects.

Question 3

What is self-efficacy?

- a) Belief in one's ability to succeed in specific situations or accomplish a task.
- b) Belief in someone else's ability to succeed in specific situations or accomplish a task.
- c) I've never heard of self-efficacy.

Display This Question:
If Question 3 What is self-efficacy? a) Belief in one's ability to succeed in specific situations or accomplish a task. Is Selected

Correct, self-efficacy is a concept related to your belief in your ability to succeed. There is a great deal of research that suggests that there is a clear link between the self-belief that you can succeed and a your performance. In general, studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. They are also more likely to design steps towards achieving goals, improving the chances of achieving successful outcomes.

Figure 2. Example of output responses for Question 3

After the real-time point-of-contact feedback questions were presented, questions were asked about whether the student's perception of the grade they could achieve had changed. In essence, the question being answered was whether knowledge about self-efficacy, delivered by real-time point-of-contact feedback during this five-minute exercise, had an effect on perceived grade expectations and, potentially, student performance. While a simple t-test was used to measure this change, given the short time between the two questions (less than five minutes), it is unlikely that other interactions influenced the measured change, other than the content (questions related to self-efficacy knowledge) and the feedback, which reinforced or corrected the student's perception based on self-efficacy literature. In addition, to support these findings, a systematic qualitative analysis and coding of opened-ended question responses identified key themes.

Data analysis

The data collected from this survey comprised both quantitative and qualitative information. It was examined in three ways.

- The pre-feedback anticipated grade was compared with the post-feedback anticipated grade (Appendix A, Questions 1 and 9), using a two-tailed, paired samples t-test with an alpha level of .05. This was run to identify any significant differences between the anticipated grade pre-feedback and post-feedback. This acted as a means to identify any change in student expectations as a result of participation in the survey. The level of effect was tested using Cohen's *d*.
- The data was also considered in terms of the grade shift from the initially selected grade. For example, those who selected a pass grade were considered as a separate group to those who initially selected any other grade, with each group considered independently (Appendix A, Questions 1 and 9). Expressed as percentages, these data were further analysed using a one-sample t-test to compare the change post-feedback.
- The survey also provided an opportunity for student written feedback through open-ended questions (Jones et al. 2012). 182 participants (21.5%) responded to this opportunity. Qualitative coding of the responses (Maykut & Morehouse 1994; Dye et al. 2000) yielded five primary themes: (1) Survey content, format and design; (2) Increased student understanding; (3) Enhanced student motivation and incentive to perform better; (4) Student self-reflection and reflection on learning; and (5) Intellectual engagement with self-efficacy, learning and studying.

Results

The two-tailed, paired samples t-test with an alpha level of .05, used to compare the pre-feedback anticipated grade ($M = 2.85$, $SD = .804$) and the post-feedback anticipated grade ($M = 3.02$, $SD = .777$) demonstrates that, on average, participants' post-treatment scores were 0.17 points higher, 95% CI [-.209, -.136]. This difference was statistically significant, $t(845) = -9.33$, $p = 0.00$. Cohen's *d* for this test was 0.22, which can be described as a small effect.

The data for the grade shift from each starting grade after the feedback treatment revealed that the lower the pre-feedback treatment grade, the higher the percentage of participants anticipating a higher grade (Figure 3). Further analysis was conducted using a one-sample t-test to compare the post-feedback treatment against the originally selected grade. These figures indicated that the lower the pre-feedback anticipated grade, the larger effect the feedback about self-efficacy had (Table 1). The difference in grade value ranged from 0.56 for those who initially selected a pass to -0.15 for those that initially selected a High Distinction (Figure 4). The number of participants not influenced by the feedback to change their mind about the average grade ranged from 54% for those originally selecting a pass to 88% for those selecting a High Distinction (Figure 5). Mean scores were also compared before the point-of-contact feedback treatment and after the feedback treatment for the complete sample (Figure 6).

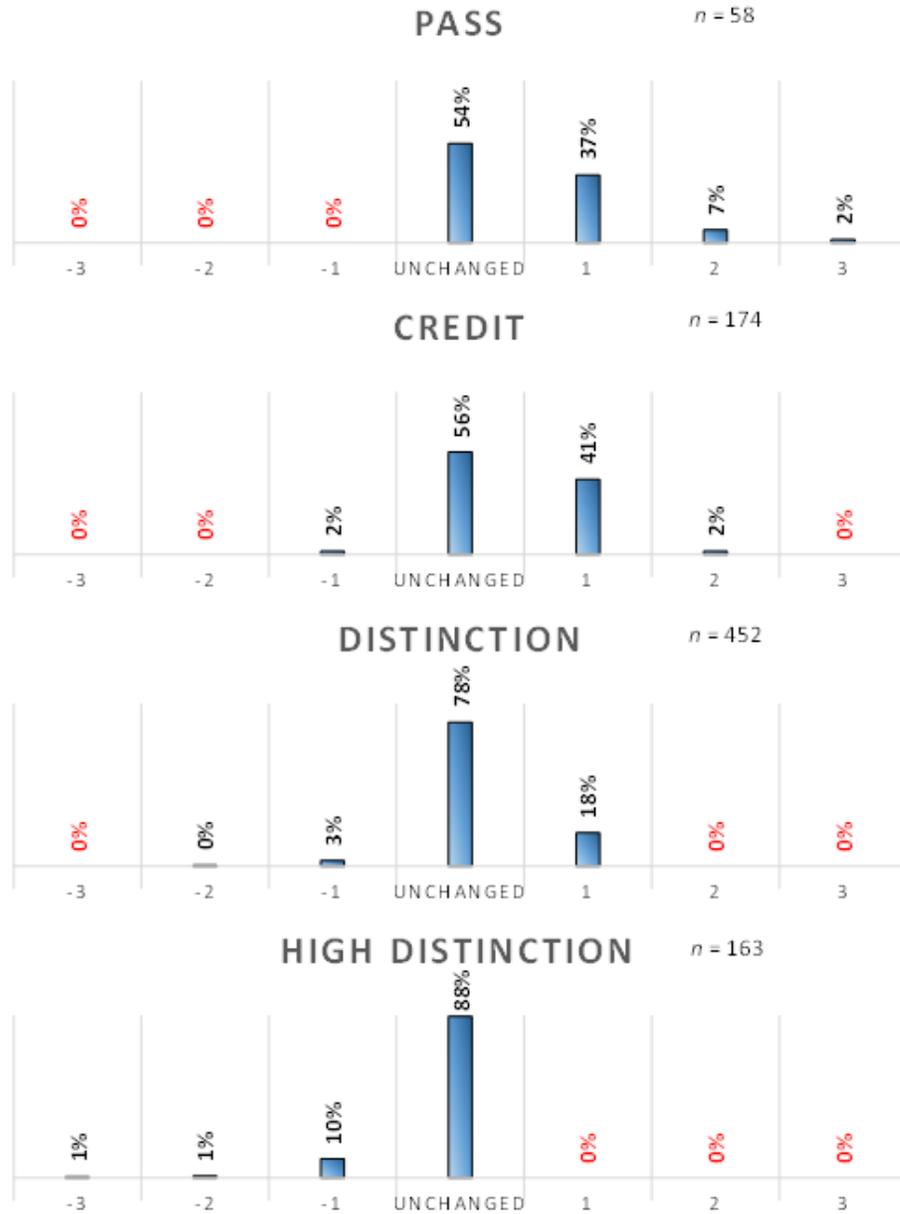


Figure 3. Shift from pre-feedback anticipated grade after the feedback treatment. The values on the horizontal scale indicate the number of grades above or below the original anticipated grade that participants anticipated after receiving feedback. Columns with red highlights are not possible to select. For example, a participant who selected a High Distinction pre-treatment could not select a higher grade post-treatment, but could select a lower grade.

Table 1. A one-sample t-test comparing the post-feedback treatment against the originally selected grade

Start Grade	Mean	SD	Diff	$t =$	$n =$	$p =$	Cohen's d
Pass	1.56	0.708	0.56	5.990	58	0.00	0.79
Credit	2.43	0.561	0.43	9.992	174	0.00	0.77
Distinction	3.14	0.459	0.14	6.561	452	0.00	0.31
High Distinction	3.85	0.434	-0.15	-4.335	163	0.00	0.35

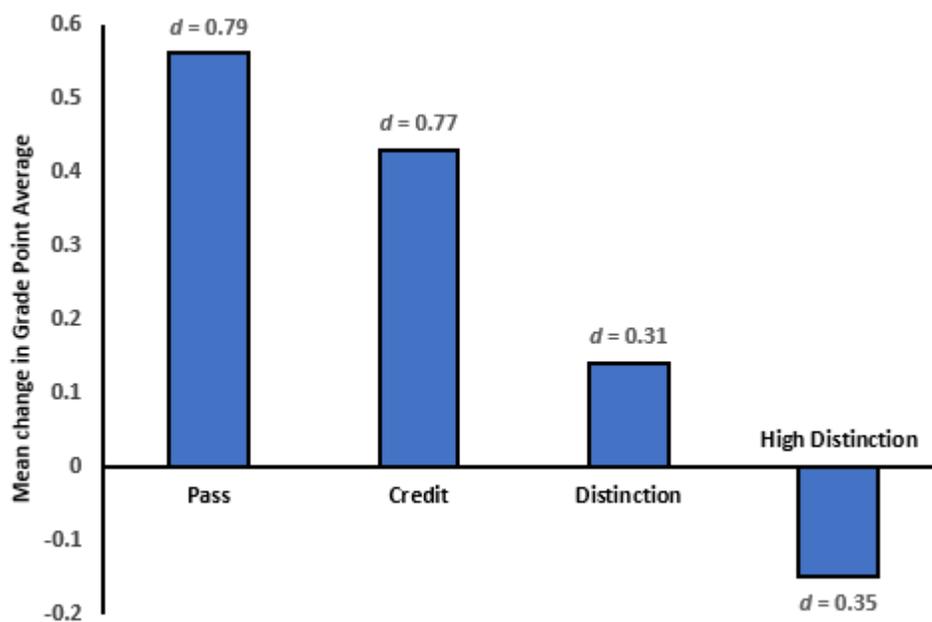


Figure 4. The difference between mean scores pre- and post-feedback for each initial anticipated grade level

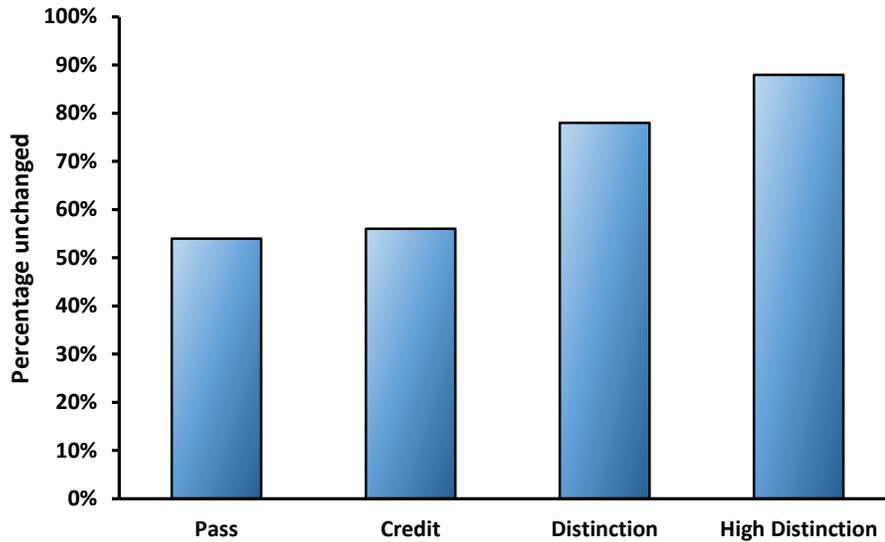


Figure 5. The proportion of participants from each originally selected grade level not changing their mind after the feedback treatment

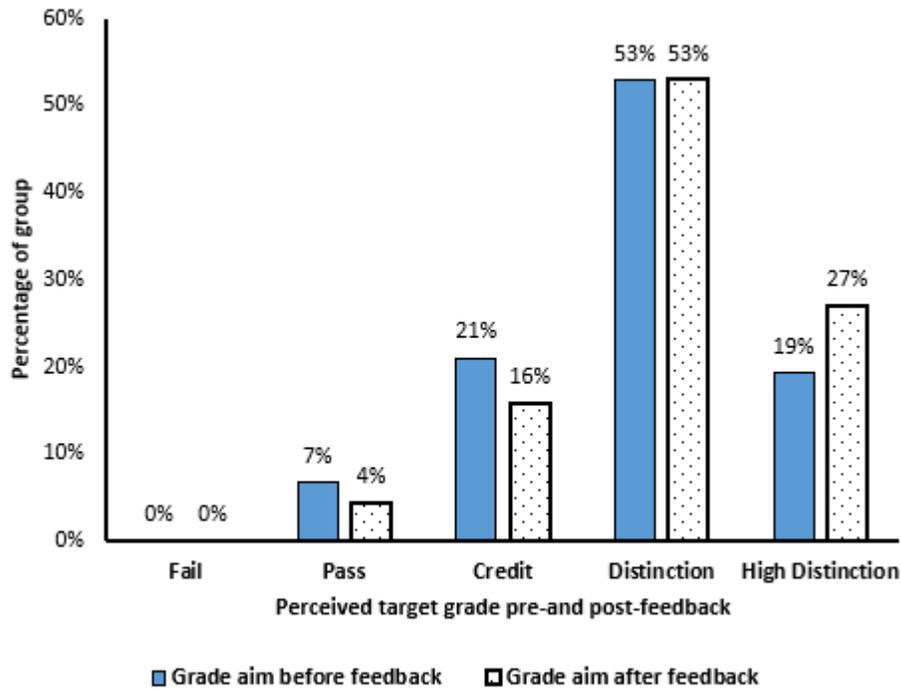


Figure 6. Mean scores compared, before and after point-of-contact feedback

The survey provided an opportunity for students to provide written feedback through an open-ended question (“Do you have any feedback about this survey?”); 182 participants (21.5%) responded to this opportunity. Coding of the responses yielded five primary themes, reflecting an ever-deepening intellectual or scholarly engagement with the survey and the concept of self-efficacy. This engagement ranged from comments on survey content, format and design through indicators of increased student understanding and commentary on enhanced student motivation and incentive to perform better; increasing student self-reflection and reflection on learning; and, for a few students, an emerging intellectual engagement with self-efficacy, learning and studying. Importantly, the rich vein of student comment provided a strong voice for the students, a voice we wish to reflect here. It is important to allow the student voice to make these comments, and to acknowledge the multiplicity of that voice. In the following, therefore, we draw on multiple, and usually short, quotes from the students. Such strings of quotes provide a relevant and powerful reflection of student engagement across the body of students, and demonstrate the potential of real-time point-of-contact feedback to engage students.

Survey content, format and design

Many comments reflected a recognition and appreciation of the survey design, beyond short notes of thanks and well-wishing (“Good luck with your survey”, “Good work”, “Great feedback, quick and easy”, “I got a lot out of it”, etc.). Some responses were, notably, personalised, and several wished the primary author well: “All the best for your PhD”; “Good luck with your studies, hope you get high distinctions”; “Well done and best wishes for your academic aspirations”.

Many commented on the survey content, format and design, along the lines of, “It is a well-designed survey that I highly appreciated”. One student commented, “I like that you provided information within the survey. Surveys are mostly seeking information without giving anything back,” while another noted, “The survey ‘gave’ as it ‘received’.” “Great format,” observed a third student, while yet another reflected that “this was a very helpful and informative session on self-efficacy and not just an information gathering exercise. A fantastic research topic that will benefit all students”. Two others responded: “Your line of questioning and supporting rationale was exceptional. Clear and concise ...”; and “Well-worded, thought provoking ideas, nice and quick to access”. Interestingly, others appreciated the sequential development of ideas: “Interesting that you gave insight to other studies on the topic as the questions went along”; “I enjoyed how the survey educated me along the way; that was a nice touch. Made it more interesting than most surveys to complete”.

A few students, however, were less impressed. One noted, interestingly, “I was under the impression that this was a survey where I gave feedback on my terms, but just seems a lecture on self-efficacy. Thanks for shoving more dictated scenarios at students...” Some were “not sure what it is meant to achieve”, or did not understand or accept the concept: “I query the validity of it”; “Can’t see much point to it”; and “I was confused”. While they engaged with the process this far, they did not explore further.

Increased student understanding

A number of short comments indicated that students recognised the value of new information: “Thanks for sharing the information”; “Very informative”; “It helped me to understand the term self-efficacy”; “I felt I learnt a bit about self-efficacy”; and “Gave me something to think about”.

Others noted that “it helped me to understand the concept self-efficacy”, and that “this was a really interesting survey. I enjoyed the feedback provided and feel I learnt a bit about self-efficacy”. “It is interesting to put a name to what I just assumed was having high expectations of myself,” said one, “knowing what I am capable of, good or bad, and working hard to achieve it.”

Others wished to know more, or were stimulated to further thought: “Something to ponder”, one student said, and another asked, “But what to do with it?”

Enhanced student motivation and incentive to perform better

Some students simply noted the survey’s motivating effect: “The survey was motivating”; “Enlightening”; “It was nice to read positive facts”; “Thank you for the motivation”; and “The survey encouraged me a little”. One pithy summary was: “Feel a little more confident about being confident”.

Many students commented on practical implications. One, for example, stated that the survey “has the potential to help people feel more confident and adopt a growth mind-set before starting session 2”, while another commented that “students will honestly measure their strength/weakness of study and may improve in areas that need improvements so as to excel or to perform well better”. A third student liked the information – “Good information to know. It has helped my enthusiasm to complete the course with a high level” – while others felt validated – “It confirmed what I sensed about the attitudes that get you better grades”.

Some students commented on themselves – “I am not very self-efficient, yet I have a belief that I will do well and I always get top grades” – suggesting a nascent sense of motivation. One student admitted to being “slightly more aware of my own input that I need to achieve a better outcome, thank you”.

For some, the implication related to them as learners. For one, the survey “prompted me to plan my session”; another expressed the need for a sound knowledge base “before my positive attitude paid off”. One student, claiming low self-efficacy, demonstrated an emerging motivation: “I have achieved much higher grades than I thought I ever would...but I study too much in fear of failure”; this student commented, “I think the fear of failure and the shame of failing spurs me to do much better.”

Fear of failing recurred as a motivating driver. One student wrote extensively about habits of procrastination – “I’m smarter than my grades currently show and will work harder this semester to get the grades I’m aiming for” – while another talked about the balance of effort and achievement:

I am more thoughtful regarding my work ethic and about the sacrifices that I may have to make to achieve my goals to be the best that I can be... I hope the study work will be fun in achieving my goals. The prospect of self-discovery is definitely something to look forward to. This survey can only help serve both our needs.

One student saw potential in the survey as a learning tool, enthusiastically noting:

Such an interesting study! And beneficial for me in that I’ve not thought about motivation to achieve in this way. I’m taking it on board and will be using it as a tool to keep me

aiming high. Motivation can be difficult with distance/online study and I find myself “slacking off” and definitely not getting the grades I know my “intellect” is capable of.

Student self-reflection and reflection on learning

Many students took the opportunity to self-reflect: “It has left me with some interesting reflections on self-efficacy”; “The point about moderate and low levels of self-efficacy being associated with improved successes in some cases is very interesting. I was thinking as I completed that response, that this could sometimes be the case”. While one student analysed their position in terms of balance between wants and outcomes, another described their thinking:

It was good to make me think, but I’m still unsure. I would love distinctions, but as a mature aged student and not studied at uni it is so different from TAFE. But, I will think positive and say yes I will get distinction in one of my subjects.

Some respondents, while contemplating the issues, were less explicit, such as the student who asked, “How do you remove expectations of yourself that are too high? It sometimes means that you are not happy with your grade no matter how good it is.” The focus on the materiality of grades assisted some in their reflections, with many commenting on grades, past, present and expected. One, for example, wrote extensively about their expectations, puzzling over whether standards differed at different universities or whether their own learning or expectations changed. Another noted:

I often find myself hoping for a pass and surprised when receiving a distinction or high distinction. Because I think my work isn’t good I seem to be constantly pushing myself. I can be very hard on myself. I may be a minority – but I thought this was worth noting.

The “worth noting” statement is, it should be noted, an important step in developing reflective habits. Another student commented at length on how personal crises may have affected their academic performance, but reflected on how, at such times, a sense of self-efficacy “inspires me to keep going no matter what!” A second student, close to the end of their course, reflected on changes in expectations and focus, while a third student suggested that their responses would have been different five years ago.

Intellectual engagement with self-efficacy, learning and studying

Some students started asking deeper and more intellectual questions. This student, for example, explored the intellectual context of efficacy and achievement:

Whilst studies of self-efficacy mentioned sound interesting, how does this correlate to Dunning and Kruger studies that link lower IQ with higher unreasonable self-efficacy expectations? I would be interested.

Several commented on the environmental context of self-efficacy and academic achievement:

I would like to see further studies about how the people a student surrounds ones’ self with...impacts their academic achievements. This survey is a great start in researching

how a student's mindset can alter their grades, but I would love to know what part their environment plays in grades.

Another took a personal perspective, weighing up the balances between a professional need for high grades and the emotional desire for them, while “resist[ing] the urge [to aim high] because of the practicalities of my situation...”. Broaching the matter differently, a second student commented: “Marker subjectivity is a huge component of student welfare, with marker existentialism impacting on the realities of life”. Several students engaged the issue through questions about (for example) the “Americanised” nature of the ideas, relationships between layers of education, relevance of self-efficacy for mature-aged versus younger students, and the roles of life experience and work. Others asked about external limitations, or pondered disciplinary differences.

Several students discussed design and concepts. One long suggestion opened with the statement that “the survey could attempt to probe for indications that there may be potential reasons/influences that may affect an individual’s perceptions of what grades...”, and reflected on influences of family, job, responsibilities and academic ability. A few also suggested that it would be useful to ask why students aim for a specific grade, suggesting the potential effects of health, family, career aspirations and employment; another talked at length about teachers’ role. Several followed this theme by suggestions for changes of wording.

This deeper engagement was reflected in one student’s comment: “Something tells me you have only just begun to scratch the surface.”

Discussion

The aim of the experiment was to test the effectiveness of point-of-contact feedback as a tool to influence student understanding of a concept, practice or idea. In education, the extent to which either the student adopts new information or it influences the student’s attitude towards study is generally unknown. The degree of adoption or influence is rarely tested before the student applies the new information. The point-of-contact feedback process provided an opportunity to test the level of uptake of a concept, and to test the possibility that it influenced the students’ attitude towards their own studies. In this experiment, students were introduced to the concept of self-efficacy as an enhancer of study outcomes; it thus provides the opportunity to reflect on student views of self-efficacy in addition to the primary purpose of testing the point-of-contact feedback process.

The demonstrable positive effect of point-of-contact feedback

Based on statements of students’ anticipated future grade as a signifier of their sense of academic self-efficacy, the experiment has demonstrated small, but statistically significant, positive change between the pre- and post-feedback results in anticipated grade (+0.17 points). This result is unsurprising, however, given that the feedback was designed to present a balanced representation of the research that informed the selected feedback. Furthermore, the size effect could better be described as optimal rather than small, because, as part of the survey design, students were presented information about the advantages of all levels of self-efficacy (low, moderate and high). This approach was informed by research that shows that setting goals that are difficult to achieve may (i) provide encouragement and thus enhance performance, or (ii) contribute to reduced motivation and thus decreased performance (Baron et al. 2016). For this reason, the survey design

presented a balanced spread of information about the effects of different levels of self-efficacy; it aimed to present information that would avoid setting unreasonable expectations. Unrealistic increases in self-efficacy can quickly be removed by disappointing results from one's effort (Bandura 1994). The approach adopted here aligns with the ethical foundations of the point-of-contact feedback model, which were to (i) provide immediate, but realistic, benefit to the student (the tangible benefit to students) and (ii) encourage students to consider their own cognitive processes (the intellectual benefit to students), whilst (iii) retaining the practical functionality of the survey as a data-collection tool for research purposes (Lake et al. 2017).

The most immediate and telling results from the experiment arose from the analysis of difference in stated grade before and after the survey for students who initially anticipated a low pass grade – 46% of students originally anticipating a pass grade changed their expectations, and subsequently anticipated a higher grade. The level of increase gradually declined the higher the initial anticipated grade, a reflection of a ceiling effect for those reporting higher grades. This is an exciting result, given both the link between self-efficacy and performance, and the fact that students with lower self-efficacy levels tend to accept that intelligence is innate and fixed (Komarraju & Nadler 2013). Moreover, lower levels of self-efficacy have been associated with higher levels of academic burnout (Rahmati 2015), decreased academic performance (Bandura 1997), decreased capacity to response to the demands of university (Chemers et al. 2001), lower motivation (van Dinther et al. 2011), reduced class participation (Galyon et al. 2012), career-path uncertainty (Fenning & May 2013) and doubts about purpose in life (DeWitz et al. 2009). By providing a means to allow students to be more aware of their own levels of self-efficacy, the feedback survey may also aid students in better regulating the psychological impact of negative experiences; self-efficacy encourages a more effective use of metacognition and self-regulation, as students move through to weakly constrained levels of education such as university (Chemers et al. 2001).

The benefits of the feedback survey using a social-persuasion design (Chiu et al. 2014; Singh et al. 2014; Oinas-Kukkonen & Harjuma 2018), therefore, appear overwhelmingly positive, and further demonstrate the ability of point-of-contact feedback to enhance student learning.

Implications for teaching practice

Despite the potential of a ceiling effect for students initially aiming for a higher grade, this study shows that the lower the student's grade expectation, the greater the chance to change their perceived anticipated grade and, by implication, associated level of self-efficacy. This experiment has demonstrated the potential to change student self-perceptions. It has also elicited overwhelming positive student commentary, notably spanning a range of intellectual engagement from mere acknowledgement to increasingly deep self-reflection and intellectual engagement with concepts. Given these outcomes, it is worth considering how research such as this relates to teaching practice. While many classroom teachers and policy-makers know that self-efficacy beliefs are important determinants of performance (Bandura 1994; McKenzie & Schweitzer 2001; Gore 2006; Whannall & Whannall 2014), encouraging students to understand this is harder. The survey attempted to do this – and has been shown to succeed – by taking the simple approach of implementing an educational intervention strategy centred on the practice of “telling the student how it is”. This reflects Oinas-Kukkonen and Harjuma's (2018) design qualities of consistency, openness and ease of use, and extends Singh et al.'s (2014) qualities of social proof and trust by providing information relevant to participants' specific knowledge levels.

The openness and ease of use is reflected in the evidence listed above, which shows that the survey design encouraged many students to actively respond positively to the survey. The qualitative feedback included many statements that acknowledged the perceived quality of the survey – how informative, clear, beneficial, brief, effective and helpful it was. This type of commentary highlights and reflects the main purpose of the point-of-contact process as a teaching tool: to provide an innovative and engaging way for learning to take place in an online environment; the students understood that they had learnt as they completed the survey. Furthermore, the qualitative feedback extended to higher-order engagement with the content of the survey – self-reflection, statement of intention to perform better through improved motivation and understanding and, most importantly, incipient intellectual engagement. Jones et al. (2012), likewise, demonstrated similar positive student responses to another online feedback system, with students both enjoying the form the feedback took and engaging more deeply with the feedback itself.

Social trust is important, since, while it is well understood that an increase in self-efficacy points to a positive impact on performance (Honicker & Broadbent 2016), if students aim for improved grades and do not receive them, their chance of leaving university increases (Elliott & Healy 2001). It is important that the feedback model support the student by explaining the potential impact of negative mastery experiences, and that it clearly expresses authenticity, veracity and transparency (Hattie & Timperley 2007). Utility (Oinas-Kukkonen & Harjuma 2018) is also important, and in this regard, it is also worth considering how the survey might serve as a preparatory tool. Bandura and Locke (2003) indicate that the functional value of high perceived self-efficacy differs for preparatory and performance aspects of a student's functioning: high levels of academic self-efficacy provide a positive, supportive function during skills development, while some self-doubt about one's performance may provide incentives to acquire the knowledge and skills needed to master the challenges at later learning stages (Bandura & Locke 2003).

Conclusion

The ability of the survey to support student metacognition through a social-persuasion design, particularly for students originally targeting lower grades, demonstrates that point-of-contact feedback can help students improve their awareness and understanding of a learning concept. The study also demonstrates how educational practitioners can use point-of-contact feedback to encourage self-reflection, understanding, motivation and intellectual engagement, and to guide and potentially transform student expectations. More broadly, point-of-contact feedback can provide an additional tool for educational practitioners to raise awareness of a specific learning concept, practice or value.

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Appendix A: The point-of-contact feedback self-efficacy survey, including the feedback received by students for each response

Dear Student,

This short questionnaire has questions about your attitudes towards the grades you will receive during this session and provides information that may help you to take control of your positive and negative experiences regarding your academic achievement.

The survey provides information about the concept of self-efficacy, and how it may affect your academic performance. This research has been approved by the Human Research Ethics Committee at Southern Cross University. The approval number is ECN-16-175.

Click on the arrow to the right below to begin the survey.

Question 1: What average grade are you aiming to achieve across all units in this study session?

- a) High Distinction
- b) Distinction
- c) Credit
- d) Pass

Feedback: No feedback for this question.

Question 2: Based on my academic ability, I expect my grades will be above average in this session?

- a) Strongly Agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly Disagree

Feedback: No feedback for this question.

Question 3: What is self-efficacy?

- a) Belief in one's ability to succeed in specific situations or accomplish a task.
- b) Belief in someone else's ability to succeed in specific situations or accomplish a task.
- c) I've never heard of self-efficacy.

Feedback

- a) Correct, self-efficacy is a concept related to your belief in your ability to succeed. There is a great deal of research that suggests that there is a clear link between the self-belief that you can succeed and a student's academic performance. In general, studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. They are also more likely to design steps towards achieving the goal so that a successful outcome will follow.

- b) You are almost right. Self-efficacy is a concept related to your belief in your ability to succeed. There is a great deal of research that suggests that there is a clear link between the self-belief that you can succeed and a student's academic performance. In general, studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. They are also more likely to design steps towards achieving the goal so that a successful outcome will follow.
- c) That's OK. Self-efficacy is just a fancy name for a concept related to your belief in your ability to succeed. There is a great deal of research that suggests that there is a clear link between the self-belief that you can succeed and a student's academic performance. Some research indicates that the optimum level of self-efficacy is slightly above ability. In general, studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. They are also more likely to design steps towards achieving the goal so that a successful outcome will follow.

Question 4: Who is more likely to make more effort to complete a task?

- a) A person with low self-efficacy
- b) A person with a moderate level of self-efficacy
- c) A person with high self-efficacy

Feedback:

- a) Not quite. Studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. The stronger the self-efficacy or mastery expectations, the more active the efforts. However, those with low self-efficacy sometimes experience incentive to learn more about an unfamiliar subject, where someone with a high self-efficacy may not prepare as well for a task.
- b) Studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. The stronger the self-efficacy or mastery expectations, the more active the efforts. However, those with low self-efficacy sometimes experience incentive to learn more about an unfamiliar subject, whereas someone with a high self-efficacy may not prepare as well for a task.
- c) That is correct. Studies show that people with high self-efficacy are more likely to make efforts to complete a task, and to persist longer in those efforts, than those with low self-efficacy. The stronger the self-efficacy or mastery expectations, the more active the efforts. However, those with low self-efficacy sometimes experience incentive to learn more about an unfamiliar subject, whereas someone with a high self-efficacy may not prepare as well for a task.

Question 5: Is a student with high self-efficacy likely to shy away from engaging in university studies?

- a) Yes
- b) No

Feedback:

- a) In numerous studies, self-efficacy or the belief that one will perform successfully, has been shown to be a predictive factor of achieved university grades. For example, research on Australian science and information technology students indicated that those with high self-efficacy showed better academic performance than those with low self-efficacy. Confident individuals typically take control over their own learning experiences, and engage in university.
- b) In numerous studies, self-efficacy or the belief that one will perform successfully, has been shown to be a predictive factor of achieved university grades. For example, research on Australian science and information technology students indicated that those with high self-efficacy showed better academic performance than those with low self-efficacy. Confident individuals typically take control over their own learning experiences, and engage in university.

Question 6: What do you think the optimum level of self-efficacy is?

- a) Low self-efficacy
- b) Moderate level of self-efficacy
- c) High self-efficacy

Feedback:

- a) While a low level of self-efficacy could encourage you to learn more, some research indicates that the optimum level of self-efficacy is slightly above ability. This encourages people to engage in challenging tasks and gain experience. In certain circumstances, lower self-efficacy can be helpful. One study examined foreign language students' beliefs about learning, goal attainment and motivation to continue with language study. It was concluded that being over-self-efficacious negatively affected student motivation, so that students who believed they were "good at languages" had less motivation to study.
- b) Some research indicates that the optimum level of self-efficacy is slightly above ability. This encourages people to engage in challenging tasks and gain experience. In certain circumstances, lower self-efficacy can be helpful. One study examined foreign language students' beliefs about learning, goal attainment and motivation to continue with language study. It was concluded that being over-self-efficacious negatively affected student motivation, so that students who believed they were "good at languages" had less motivation to study.
- c) While a high level of self-efficacy is more likely to lead to the completion of tasks, some research indicates that the optimum level of self-efficacy is slightly above ability. This encourages people to engage in challenging tasks and gain experience. In certain circumstances, lower self-efficacy can be helpful. One study examined foreign language students' beliefs about learning, goal attainment and motivation to continue with language study. It was concluded that being over-self-efficacious negatively affected student motivation, so that students who believed they were "good at languages" had less motivation to study.

Question 7: How important do you think your past experiences in high school are to your self-efficacy?

- a) Important
- b) Not really important

Feedback:

Studies show that a strong reason for students having a low level of self-efficacy relates to their mastery experiences in elementary and secondary education, with a series of negative mastery experiences potentially leading to low level of self-efficacy. However, the good news is that regardless of these experiences you have had in the past you can choose to take a more positive approach and focus on improvement rather than past results. Just because a student didn't do well, does not mean they cannot in the future.

Question 8: After seeing the feedback from each question, has this changed your perception of what grade you are aiming for?

- c) Yes
- d) No

No feedback

Question 9: Keeping in mind that people with high self-efficacy are more likely to design steps towards achieving a successful goal, what average grade are you now aiming to achieve across all the units in this session?

- a) High Distinction
- b) Distinction
- c) Credit
- d) Pass

Question 10: Based on my academic ability, I expect my grades will be above average in this session?

- a) Strongly Agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly Disagree

No feedback

Question 11: What mode of study are you undertaking?

- a) On campus
- b) Online
- c) Both

Question 12: How old are you? Option limited slider bar (16-100).

Question 13: What is your gender?

- a) Female
- b) Male
- c) Transgender

- d) Non-binary gender
- e) Prefer not to say

Question 14: What type of course are you enrolled in?

- a) Associate degree or PSP course
- b) Undergraduate degree course
- c) Honours course
- d) Postgraduate Certificate or Diploma course
- e) Masters by coursework
- f) Professional doctorate course
- g) I'm exclusively a staff member of SCU

Question 15: What year of study are you in for your currently enrolled course? Sliders 1-10 years.

Question 16: Do you have any feedback about this survey?

Dialog box

Question 17: Would you like to know more about self-efficacy?

Yes/No

Feedback (Note if respondent answers no, they will also receive the list of references for further reading:

A note will be given saying “We know you answered no to wanting to know more about self-efficacy, but just in case we have included a list of resources just in case you are interested in looking into these at a later date.”

Self-efficacy is just one factor that combines with a myriad of other factors to influence your results. Altering ones perceived efficacy is heavily dependent on mastery experience and includes factors such as the preconception of ones capabilities, the perceived difficulty of the tasks, the effort expended, the situational circumstances, the pattern of success or failure, and the external aid that one receives. A series of negative results can very easily effect self-efficacy, just as a series of positive results can positively affect self-efficacy.

With respect to the external aid that you as a student can make use of, it is important if you need advice on academic tasks to seek out help through the academic skills unit and/or the liaison librarian for your school