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Student Perceptions Following Assessment: An Investigation of the Effort-Reward Relationship and its Impact on Efficacy Cognitions.

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ABSTRACT

Assessment plays a significant role in the learning process, with both positive and negative feedback providing useful information for students. In the case of positive feedback students are comforted in their quality and direction of their study efforts, whereas negative feedback can encourage a reassessment of study strategies and effort. However, the relationship between negative feedback and future performance is a complex one that must take into consideration the cognitions of students about the feedback process. Specifically how a student thinks about their assessment will influence their response. In this exploratory study, using post-graduate business students, we examine how assessment results influence fairness perceptions and the consequences for self-efficacy beliefs regarding future performance. Implications for teaching are also discussed.

KEYWORDS

Assessment; Equity theory, Self-efficacy, Procedural justice.

INTRODUCTION

The process of higher education learning is not only demanding in terms of acquiring new skills and knowledge, but also exposes students to regular assessment of their performance. Feedback provides information that is assimilated to provide self-evaluations on performance ability and understanding (Bandura, 1982) and provides motivation for future learning effort. Assessments also have significant consequences for those being rated, providing important information for distribution of rewards and grades, which can have significant consequences for future work and life (Tata, 1999). Consequently students are greatly concerned about, and highly attentive to, grades obtained on assignments and examinations (Rau & Durand, 2000).

While grades are indicative of students’ acquisition of knowledge and skills in a particular content area (Strobino, Gravitz, & Liddle, 2002), grades received, especially for assignments, can have substantial impact on future performance within a subject (Winter, Neal & Warner, 1996). Grades can signal either positive or negative performance feedback and can have important implications for future learning efforts. High grades which signal positive feedback generally lead to a sense of mastery over task elements, motivating future effort to maintain performance (Locke & Latham,
Negative feedback in the form of lower grade results is also important for learning, with research indicating that individuals generally respond to initial negative feedback by increasing their effort (Kanfer, 1990). However, negative feedback can also lead to questioning of ability to perform tasks and lead to spirals of reduced effort and performance decline (Lindsley, Brass & Thomas, 1995). This is particularly problematic when dealing with novel skills and knowledge, which often result in low grades while students experiment with learning strategies and develop domain knowledge as part of the learning process (Nease, et al, 1999). Low grades can also reduce the student’s willingness to read or understand the instructor’s suggestions (Winter, et al. 1996). The fact that negative feedback can produce either motivational effort or decline highlights the significance of student processing of results.

Given the importance of student processing of performance feedback, there is surprisingly little research focused on student processing of results (Strobino, et al., 2002). One aspect of student perceptions that has been examined is the impact of discrepancy between student expectations and actual performance (Goulden & Griffen, 1995; Woo & Frank, 2000). Disappointment with results has been suggested to lead to lower teacher assessment, and higher levels of results to result in more favourable rating of lecturers. Underlying these evaluations of instructors is the perception of student’s mind about equity and procedural justice of the assessment process (Tata, 1999).

**Equity and Procedural Justice**

Both equity theory and procedural justice issues offer insight into the dynamics that could lead to decline in motivation after negative performance assessment. According to equity theory, performance is evaluated through effort-reward comparison perceptions (Adams, 1963) and these perceptions have substantial motivational consequences, especially when they involve comparisons with others (Greenberg, 1990). This evaluation can result in a perception of receiving equitable reward to effort (equity), high reward relative to effort (over-reward) or low reward relative to effort (under-reward). Students are likely to make these equity perceptions through judging their efforts relative to results achieved and by noting the results of other students. Procedural justice (perceptions by those being assessed as to the fairness of the process) can also impact on students’ perceptions. Considerable research demonstrates that perceptions by those being assessed that an evaluation process is subjective removes the incentive for effortful performance (Greenberg, 1990). This research highlights that the motivational effects resulting from equity and procedural concerns are likely to be dominated by perceptions rather than by actual problems in assessment. Thus the concern is for perceptions of fairness or otherwise in assessment, not actual practice.

Despite intentions to objectively enhance the equity and fairness with processes of assessment, problems may remain inherent in the cognitive processing of effort-reward relationship by students. Of particular concern is the relatively consistent research finding that there is only a poor correlation between effort, in terms of hours studied, and course performance (Michaels & Miethe, 1989; Okpala et. al, 2000; Rau & Durand, 2000; Schuman et al, 1985). A considerable problem in students judging effort-reward relationships derives from differing levels of “domain knowledge” (Okpala, et. al, 2000). For example, students differ in skills that may underpin learning in subjects (Ackerman, 1987), such as mathematical knowledge in statistic courses or writing skills for course with essay based assessment tasks. The significance of these qualitative elements and prior knowledge may not be fully accounted for by students in their calculus of effort expended. Last minute frenetic cramming is characteristic of many students’ approaches to exams and assignments (Rau & Durand, 2000) and the urgency and intensity of effort may be the most salient memory of their effort expended. Even if substantial effort and appropriate study habits are engaged, students’ weaknesses in writing skill may hinder presentation of their understanding of course material. Thus, due to the complex relationship of effort and results, students may arrive at a perception that assignment or course performance may not be commensurate with effort.
Self-efficacy

Self-efficacy is defined as an individual’s perceptions about ‘how well one can execute courses of action required dealing with perspective situations’ (Bandura, 1982, p.122). In the learning situation feedback information is assimilated to provide self-evaluations about the task. Positive feedback leads to a sense of mastery over task elements and increase self-efficacy (Locke & Latham, 1990). In the same way, negative performance can lead to lowering self-efficacy (Lindsley, et al, 1995).

The significance of self-efficacy within education and training lies with its impact on future performance. Self-efficacy beliefs regulate performance by determining the task choices, effort, and persistence and are also linked with self-aiding or self-hindering thought patterns that accompany performance (Wood & Bandura, 1989). Bandura, (1989) suggests that because high-efficacy individuals believe that they have some control over the task they are less likely to fear the task or be unhappy with the task. Other researchers have also shown that competence in a task is associated with more task-enjoyment and satisfaction with task demands (Kanfer, 1990). Research has demonstrated that individuals with high self-efficacy are more likely to set themselves challenging goals, and are confident of their ability to reach goals (Wood & Bandura, 1989). When confronted with obstacles to the achievement of tasks self-efficacious individuals display determination and persistence in their efforts to reach their goals. People with high self-efficacy are more resilient in their effort to overcome obstacles in the pursuit of goals and tend to set more challenging (learning) goals (Wood & Bandura, 1989). Thus high self-efficacy among students is likely to be associated with high motivation and effort following course assessment.

This study brings these issues of cognitions associated with perceived effort-reward divergence and self-efficacy together in an exploration of student perceptions to assignment results. Specifically, we are concerned with students’ perceptions of the grade received relative to expectations, their perceptions of the process, their future performance expectations and the impact on efficacy beliefs.

**METHODOLOGY**

Participants were 80 post-graduate students enrolled in an MBA program. They completed two anonymous surveys, one at the beginning of the course and the second after the provision of feedback on assignment performance. The first survey asked respondents to estimate their grade for the next assignment and asked them to rate their confidence in reaching that grade. The second survey asked respondents to indicate their actual level of attainment, their perceptions of the equity of the process, expectations concerning performance on future assessment, and their level of confidence about future performance.

Expected performance level was measured by asking respondents to estimate the grade they expected for their subsequent assignment (e.g. high distinction, distinction credit, pass or fail.) Assignments were essay based, requiring students to address a theoretical issue of the course. Absolute performance was the actual grade obtained.

Measures of self-efficacy were derived from a probability rating for each of ten levels of performance (95, 90, 85, 80, 75, 70, 65, 60, 55, 50 marks) using a 100 point certainty scale on which 0 = ‘certain the performance cannot be achieved’ and 100 = ‘certain that the performance can be achieved’. For each grade of performance, participants were provided with historical data about past distributions. This required students to confront objective data about their probability of performance in the next assignment while they make a number of probability estimates. The responses to the scale are a measure of the strength of self-efficacy beliefs while those marks on
which an individual rated as greater than the historical probabilities are effectively measures of self-efficacy magnitude. A composite measure of self-efficacy was created by summing those probability ratings above the historical data probabilities (Lee & Bobko, 1994).

Effort-reward perceptions were measured in two ways. The first measure was termed ‘equity perceptions’ and was assessed by asking students to assess the grade received relative to that which they believed they deserved, using a nine-point scale (-4 = Much less than I deserved; 0 = neutral mid point, 4 = Much more than I deserved). This nine-point scale was recoded into three categories representing each of the equity outcomes (-4 to –2 ‘less than deserved’/ -1- to 1 ‘equal’/ 2 to 4 ‘more than I deserved’) to allow for non-linear effects. The second measure was termed ‘procedural justice perceptions’ and was assessed by asking students to rate, on a similar nine-point scale, the fairness of the marking process.

Since any discrepancy between grades wanted or expected and actual grades received can influence self-efficacy, students were asked to record ‘grade performance wanted’ and ‘grade point performance expected’ using a nine-point scale. This was then compared to the actual grade received, to create two new discrepancy scales. Since it was not clear whether the estimated effects would be linear, both scales were combined to three categories (grade received less than/equivalent/more than grade wanted and expected).

RESULTS

Self-efficacy and performance
Not surprisingly, self-efficacy rating was significantly associated with expected performance ($F = 21.60, p < 0.001$). Individuals with higher self-efficacy expected to achieve higher levels of performance. However efficacy at time1 was not significant in predicting subsequent performance. Since efficacy at time1 is not a significant predictor of performance, one would expect updating of efficacy after performance feedback. This occurred, with a significant change in self-efficacy ratings from time1 to time2 ($t = 8.5, p < 0.001$). Efficacy ratings post-feedback were significantly associated with performance ($F = 7.92, p = 0.001$), suggesting that efficacy ratings were adjusted following feedback on performance.

Predicting self-efficacy
To examine the relationship between procedural justice perceptions, actual performance, and self-efficacy, univariate analyses were conducted using linear regression for continuous variables (efficacy at time1 and procedural justice perceptions) and univariate ANOVA for ordinal variables (absolute performance, grade wanted and expected discrepancies, and equity perceptions). Efficacy at time1, procedural justice perceptions, actual performance and equity perceptions were all significant in predicting self-efficacy at time2 ($p < 0.05$). Details are shown in Table 1.

Table 1: Univariate analyses, predicting efficacy at time2

<table>
<thead>
<tr>
<th>IV</th>
<th>$\beta$</th>
<th>St.Dev</th>
<th>$T$</th>
<th>$p$</th>
<th>$R^2$(adj)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy time1</td>
<td>0.283</td>
<td>0.105</td>
<td>6.10</td>
<td>0.008</td>
<td>5.4</td>
</tr>
<tr>
<td>Grade wanted discrepancy</td>
<td>11.712</td>
<td>5.201</td>
<td>2.25</td>
<td>0.027</td>
<td>4.4</td>
</tr>
<tr>
<td>Grade expected discrepancy</td>
<td>7.994</td>
<td>4.324</td>
<td>1.85</td>
<td>0.068</td>
<td>2.6</td>
</tr>
<tr>
<td>Procedural justice</td>
<td>11.279</td>
<td>5.417</td>
<td>2.08</td>
<td>0.040</td>
<td>3.7</td>
</tr>
</tbody>
</table>
A multivariate model was constructed to determine the effect of equity perceptions on self-efficacy at time_2, after allowing for the effect of other factors. Because the correlation between equity perception and procedural justice perceptions was high (r = 0.585), we focused on equity perceptions alone to get a better indicator of the relationship of effort-reward perceptions and self-efficacy. In this situation, equity perceptions were still significant in predicting efficacy at time_2. The results are shown in Table 2.

Table 2: Prediction of efficacy at time_2

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute performance</td>
<td>2</td>
<td>115899</td>
<td>57949</td>
<td>7.92</td>
<td>0.001</td>
</tr>
<tr>
<td>Equity perception</td>
<td>2</td>
<td>66772</td>
<td>33386</td>
<td>3.69</td>
<td>0.029</td>
</tr>
</tbody>
</table>

Examination of effect sizes revealed a very strong non-linear effect of equity perceptions. After allowing for other factors, a judgment that the grading result was 'less than I deserved' resulted in an average decrease in efficacy of 57.8 points. In contrast, a judgment that the grading result was 'more than I deserved' resulted in an average (non-significant) decrease in efficacy of 4.8 points. Absolute performance also had an important, though less substantial effect. A decrease in performance of one grade led to an average decrease in self-efficacy of 27.6 points; a decrease of two grades led to an average decrease in self-efficacy of 48.7 points. Hence the effect of equity perceptions on self-efficacy was greater than the effect of actual performance.

**DISCUSSION**

Self-efficacy has been a major focus of research in training and development fields and in higher education because of the substantial support for a link between efficacy and performance. This study has supported this association. The study also supports research that highlights that the relationship is one that requires distinguishing between student optimism and confidence based on experience (Gist & Mitchell, 1992). There was no significant relationship between efficacy at time_1 and subsequent assignment grade or with efficacy at time_2. The complexity and novelty of the task appears to have reduced the accuracy of estimations of self-efficacy at time_1. This is not surprising, given that students had limited experience with which to predict their performance, and hence the result would not be unexpected with a relatively novel task (Wood & Bandura, 1989).
Consistent with Thomas & Mathieu (1994) we found that self-efficacy perceptions are not simply a product of discrepancies between grade wanted or expected with that obtained, but also reflect how people think about the assessment received. We found a significant relationship between equity perceptions of effort to rewards and self-efficacy, even after controlling for the effect of the grade wanted or expected on self-efficacy. This finding supports the hypothesis that students’ perceptions about their effort relative to results have motivational consequences.

The study has highlighted the importance of the cognitive processing that accompanies assignment feedback on subsequent performance. In particular, this study shows that feedback can be associated with negative perceptions about the equity and procedural justice of the assignment process, even without objective supporting evidence. In other words when students receive a result lower than they deserve relative to the effort directed at the assignment they are more likely to perceive the assessment process as unfair. These beliefs impact on their self-efficacy about future performance, even when other aspects of the situation (e.g. initial self-efficacy) are controlled for. It is argued that these perceptions arise from cognitive calculations about expected correlations between effort expended and rewards received, not just discrepancies between results wanted and achieved.

Given the high incidence of problems in assignments associated with misdirected strategies and with poor writing skills, it is a concern that these problems can lead to negative perceptions about equity (deserving better results) and procedural justice (fairness of process). From a teaching perspective, it would be prudent to try and deal with these perceptions before they arise. For example, lecturers can ensure that students recognise that assignment assessment focuses on outcomes delivered, rather than evaluating effort. Some discussion of the nature of the assessment process and a reminder that misdirected effort is a major error in essays may help to convey this idea. Since essay writing skills play a considerable role in the quality of assignments submitted, students would be well advised to focus on developing these skills. Learning institutions have long provided resources to aid student essay writing skill development. Given the results of this study that poor essay performance may contribute to reduced self-efficacy for future effort as well as raising student perceptions of concern for equity and fairness then institutions may need to give even greater attention to developing these writing skills.

REFERENCES


