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The Utilisation of Formative Assessment in the Structure of Undergraduate Course Content: An Instrument for Success and Self-Awareness

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Ashley Stark

Method
Participants
Participants were comprised of a 28 person sample of undergraduate students enrolled in a 15-week course through the Faculty of Society and Design at Bond University. Due to the anonymous nature of this study, no further demographic information was provided on the study subjects.

Procedure
Students enrolled in this course were subject to weekly, formative assessments in the form of online quizzes in Week 3 to 11 of the semester. There were 10 quizzes in total, with each quiz’s content focusing on the concepts addressed in the course that week. Quizzes were made available directly after the lecture for that week up until the lecture for the following week, requiring them to be completed on a weekly basis. Students received immediate feedback on what questions they answered correctly and incorrectly and were encouraged to use this information to provide further insight into what course content could be further reviewed prior to the final examination at the end of the semester.

Design
The program of research assessed the relationship between number of quizzes completed and the students’ overall grade for the course. Consequently, the predictor variable for this study was the amount of engagement in formative assessment by the student as assessed by number of quizzes completed. Additionally, the criterion variable for this study was the overall grade received by the student at the close of the semester, assessed by final examination awarded out of 100%.

In order to assess the relationship between formative assessment and overall course achievement, simple bivariate correlations were conducted. To assess the predictive utility of formative assessment on student achievement, a standard regression was performed, with overall grades regressed onto number of quizzes completed.

As it may be seen in Table 1, engagement in formative assessment and overall course grade were significantly positively correlated such that higher levels of engagement in formative assessment was related to higher course grades overall. The relationship demonstrated a moderate effect size (Cohen, 1988). The correlation was not deemed to be problematic with respect to issues surrounding multicollinearity.

Table 1
Summary of Intercorrelations, Means, Standard Deviations, and Confidence Intervals for Engagement with Formative Assessment and Overall Course Grades (N = 28)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Formative Assessment</td>
<td></td>
<td></td>
<td>8.8</td>
<td>1.3</td>
</tr>
<tr>
<td>2. Course Grade</td>
<td>.42*</td>
<td></td>
<td>70.0</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Note: M = mean, SD = standard deviation. *p < .05; **p < .01.

Regression Analysis
The model accounted for significant variance in overall course grades, R^2 = 0.18, adjusted R^2 = 0.14, F(1, 24) = 4.93, p = .037. The R^2 value of .18 indicates that 13.5% of the variance in course grades as predicted by engagement in formative assessment. The regression coefficient for engagement in formative assessment was significantly different from zero. Table 2 displays the unstandardised regression coefficients and associated 95% confidence intervals in addition to the standardised regression coefficients and R^2 for the model.

Table 2
Engagement in Formative Assessment as a Predictor for Overall Course Grades

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>95% CI for B</th>
<th>β</th>
<th>R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>.18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>40.83*</td>
<td>13.26</td>
<td>[.23, .65]</td>
<td>.23</td>
<td></td>
</tr>
<tr>
<td>R^2</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N = 25; CI = confidence interval. *p < .05; **p < .01.

Discussion
This study sought to assess the association between student engagement with formative assessment and overall course achievement. Results supported the hypothesis that the level of student engagement in formative assessment would be a significant, positive predictor of overall course grades. These findings concur with the mastery learning theory’s propositions that the utilisation of formative assessment throughout the learning process will facilitate the identification of individual difficulties, as well as the employment of remedial procedures that can result in achieving desired learning outcomes (Bond, Hastings, & Madacs, 1971). These results are also congruent with research demonstrating an association between engagement in formative assessment and overall academic achievement (Black & William, 1988, Organisation for Economic Co-operation & Development, 1999).

This study contributed to an area of research that targets more insight with respect to the potential educational benefits of varied forms of assessment. Nevertheless, there were obvious limitations to this study. More specifically, the relatively limited sample size procured from one undergraduate class at just one tertiary institution yielded limited generalisability and applicability to the greater community. Consequently, future research could assess a larger sample from a broader range of academic backgrounds. Additionally, only one form of formative assessment was utilized and assessed with respect to this particular sample. Consequently, future research could assess the predictability of a range of different formative assessments to ascertain differences in benefits to learning.

Overall, the utilisation of formative assessment can provide valuable information to both teachers and students that can be used to modify course activities and facilitate successful achievement of learning outcomes (Boggs & Tang, 2011). This study endeavoured to assess the nature of this relationship in undergraduate students. Results indicated that engagement in formative assessment can predict overall course achievement. However, given the paucity of research in this area, further research is required to unearth the potentially unexplored benefits of this form of assessment.

References