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Research Result Summaries

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# Comparison of two sections of a business course utilizing different weekly quizzing methods

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# Summary Results for Comparison of two sections of a business course utilizing different weekly quizzing methods

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*ABSTRACT*

*The impact of a series of low-stakes multiple choice quizzes as a formative learning tool on learning performance outcomes using a minimum target grade was studied. The subjects were 489 students from two different semester groups of a large-lecture introductory marketing class, Fall (n=172) and Winter (n=317). The Fall group was evaluated using a best grade performance assessment system (BG) while the Winter group was evaluated using a target grade performance assessment system (TG). The learning performance outcomes were measured using midterm and final examination results. An ANOVA analysis was undertaken using major, university experience, number of weekly meetings, number of hours on the LMS, and class participation as covariates. The ANOVA results indicated that the TG group had statistically significant higher examination grades than the BG group indicating that a "Targeted Grade" performance assessment approach was more beneficial as a motivation for formative learning than a "Best Grade" approach.*

**ANOVA Comparison of Means of Performance Measures Using Semester Level, Major, Number of Class Meetings, Hours on the LMS and Class Participation as Covariates**

| Performance Measure | Target Performance Group | | | Best Performance Group | | | ANOVA Results | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | F | Sig. |
| Midterm MCQ  (Max 65) | 317 | 43.15 | 9.10 | 172 | 41.52 | 8.98 | 8.84 | .000** |
| Final Exam MCQ (Max 93) | 317 | 64.98 | 14.37 | 172 | 57.65 | 13.73 | 15.63 | .000** |
| Final Exam Essay (Max 7) | 317 | 5.06 | 1.79 | 172 | 4.33 | 2.02 | 12.31 | .000** |
| Hours Spent on LMS (a) | 317 | 16.16 | 10.79 | 172 | 18.00 | 12.35 | 9.12 | .000** |
| Class Participation (Max 5) (b) | 317 | 3.49 | 1.44 | 172 | 2.99 | 1.44 | 21.01 | .000** |
| Course % Grade (Max 100) | 317 | 70.92 | 12.81 | 172 | 65.76 | 14.09 | 16.32 | .000** |
| Alternative Exercise (Max 3) | 317 | 1.76 | 1.32 | 172 | 1.39 | 1.27 | 21.88 | .000** |
| Practice Midterm  (Max 25) | 251 | 18.51 | 3.27 | 129 | 19.35 | 3.26 | 10.34 | .000** |
| Practice Final  (Max 25) | 234 | 17.37 | 3.73 | 121 | 16.50 | 4.22 | 9.87 | .000** |
| Chapter Quizzes (Max 80) | 317 | 53.20 | 12.84 | 172 | 50.05 | 17.23 | 42.61 | .000** |
| +AOL Exercise (Max 50) | 317 | 38.21 | 5.90 | 114 | 29.35 | 8.90 | 34.57 | .000** |

(a) Analyzed without Hours on LMS as a covariate.
(b) Analyzed without Class Participation as a covariate.
** Significant   $P < .05$
+ Exercise was mandatory for Target Performance Group and Optional for Best Performance Group

**ANOVA Comparison of Online Quiz Means By Attempt Number Using Semester Level, Major, Number of Class Meetings, Hours on the LMS and Class Participation as Covariates**

| Quiz # and Grade | Target Performance Group | | | Best Performance Group | | | ANOVA Results | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD | F | Sig. |
| Quiz 1 Max Grade | 308 | 7.20 | 1.48 | 158 | 7.80 | 1.44 | 7.45 | .000** |
| Quiz 2 Max Grade | 306 | 7.32 | 1.42 | 152 | 7.55 | 1.46 | 7.39 | .000** |
| Quiz 3 Max Grade | 298 | 7.24 | 1.22 | 141 | 7.33 | 1.49 | 3.85 | .001** |
| Quiz 4 Max Grade | 297 | 7.73 | 1.33 | 141 | 7.88 | 1.41 | 7.24 | .000** |
| Quiz 5 Max Grade | 248 | 7.70 | 1.23 | 145 | 7.90 | 1.59 | 4.57 | .000** |
| Quiz 6 Max Grade | 276 | 7.50 | 1.38 | 135 | 7.06 | 1.76 | 11.08 | .000** |
| Quiz 7 Max Grade | 280 | 7.48 | 1.39 | 130 | 7.68 | 1.64 | 8.62 | .000** |
| Quiz 8 Max Grade | 240 | 7.83 | 1.29 | 129 | 7.71 | 1.58 | 8.03 | .000** |
| | | | | | | | | |
| Quiz 1 Attempt 1 | 308 | 6.24 | 1.91 | 158 | 5.72 | 2.08 | 4.38 | .000** |
| Quiz 2 Attempt 1 | 306 | 6.27 | 1.91 | 152 | 5.76 | 2.07 | 5.52 | .000** |
| Quiz 3 Attempt 1 | 298 | 6.20 | 1.71 | 141 | 5.65 | 1.93 | 4.62 | .000** |
| Quiz 4 Attempt 1 | 297 | 6.82 | 1.92 | 141 | 6.54 | 1.91 | 2.82 | .011** |
| Quiz 5 Attempt 1 | 248 | 6.72 | 1.82 | 145 | 6.37 | 1.84 | 2.86 | .010** |
| Quiz 6 Attempt 1 | 276 | 6.22 | 2.05 | 135 | 5.67 | 1.84 | 5.01 | .000** |
| Quiz 7 Attempt 1 | 280 | 6.41 | 1.93 | 131 | 5.87 | 2.11 | 4.48 | .000** |
| Quiz 8 Attempt 1 | 240 | 6.90 | 1.91 | 129 | 6.55 | 2.00 | 2.62 | .017** |

** Significant    $P < .05$
* Marginally Significant    $P < .10$
+ Exercise was mandatory for Target Performance Group and Optional for Best Performance Group

**Correlation of Overall Chapter Quiz Performance With Exam Performance By Assessment Group**

| | All Chapter Quiz Grades (Max 80) | | | | | |
|---|---|---|---|---|---|---|
| Course Performance Measure | Target Performance Group | | | Best Performance Group | | |
| | N | r-value | Sig. | N | r-value | Sig. |
| Midterm Exam Grades (Max 65) | 318 | .275 | .000** | 172 | .375 | .000** |
| Final Exam MCQ Grade (Max 93) | 318 | .359 | .000** | 172 | .339 | .000** |
| Final Exam Essay Grade (Max 7) | 318 | .362 | .000** | 172 | .364 | .000** |

** Significant   $P < .05$

**Exercise Completion Percentages**
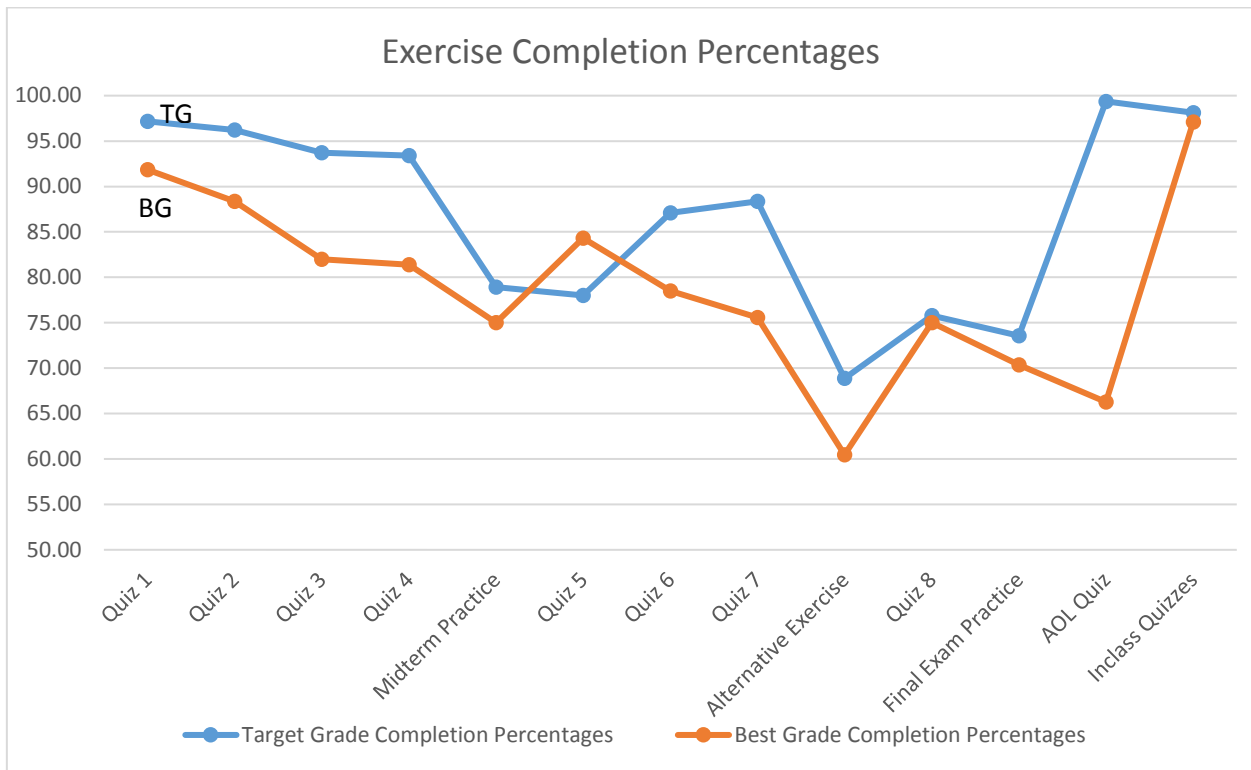
The research reported here sought to explore whether students who were exposed to an online testing system with a target grade performance outcome motivation (TG) would outperform students who were exposed to a best grade performance outcome motivation (BG) on midterm and final exams. The findings indicate that the TG group of students did outperform the BG group. In fact, in virtually every measured aspect of the course, except the online practice midterm and maximum raw quiz scores, the TG group outperformed the BG group.