

## Synergism in the Inquiry Lab: An Analysis of Time Targets and Achievement

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**Abstract :** After gathering data from experimental procedures, inquiry-oriented-science labs often allow students the freedom to stay and complete the write up in class or leave lab early and complete the write up later. Teachers must decide whether to allow students this freedom to self-regulate this time. Student interviews have indicated four time-target strategies that may influence how students utilize this time: grade-target-A, grade-target-C, time-limited, and proficiency. The hypothesis tested was that variability in class composition relative to the four grade-target strategies has an impact on when students leave class, which in turn may influence their overall learning as exemplified by grades. Students were divided into the four indicated groups with a survey. Class composition and the GTA teaching the class had significant impacts on how long students stayed in class with class composition having the greatest impact. A factor analysis identified two factors. Factor 1 included classes with percentages of grade-target students opposite time-limited/proficiency students and explained 43% of the variance. Factor 2 included classes with percentages of grade-target-A/proficiency students opposite grade-target-C students and explained 33% of the variance. Students who stayed longer received significantly higher grades ( $P = 0.008$ ) with no significant relationships between grade and Factor 1 or Factor 2 ( $P > 0.05$ ). The time students stayed in class was significantly positively related to Factor 1 ( $P = 0.006$ ) and significantly negatively related to Factor 2 ( $P = 0.008$ ). These results support the hypothesis and indicate that teachers may want to know the composition of student-target strategies before deciding on how to have students allocate study time at the end of inquiry-oriented labs. According to these results, ideal classes for self-regulation have a high proportion of proficiency and time-limited students and a low proportion of grade-target students, or a high proportion of grade-target-A and proficiency students and a low proportion of grade-target-C students. Non-ideal classes for self-regulation were comprised of the inverse proportions.

**Keywords :** grades, inquiry lab design, synergism in student motivation, class composition

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