
Findings from the Evaluation of Learn and Earn:
A Math & Science Tutorial Program with Monetary Incentives

EXECUTIVE SUMMARY

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Introduction

In January 2008, the Learning Makes a Difference Foundation[®] (LMDF) launched “Learn and Earn,” a pilot program aimed at increasing achievement and interest in math and science by providing students with tutoring and by rewarding them with money for participation and achievement. The program was provided to low-achieving students at two Fulton County schools – Bear Creek Middle School and Creekside High School – both located in Fairburn, Ga., outside Atlanta. Students were paid \$8/hr and could also earn a bonus cash award at the end of the program for passing standardized tests and earning a B or better in math and science.

The Learn and Earn program targeted 8th graders at Bear Creek and 11th graders at Creekside. Twenty students were selected from each school by principals on the basis of low math and science achievement and good attendance and behavior. Tutoring was provided by a teacher (also selected by the principal) for each subject. Tutoring was provided in two-hour sessions, two sessions per week (one for each subject) for 14 weeks, during the 2008 Spring semester. On each day of tutoring, half of the students received math and the other half science, so that the class size for tutoring was no more than 10 students per teacher.

LMDF contracted with EMSTAR Research, Inc. to conduct an independent evaluation of the Learn and Earn (L&E) program.

Attendance

Program policy stated that any student missing more than two sessions would be dismissed from the program. Thirty of 40 students (75%) met the threshold of minimum attendance. Broken down by school, 16 Bear Creek students (80%) and 14 Creekside students (70%) met the threshold for minimum attendance. Results of subsequent analyses are based on these program graduates.

Demographics

The L&E sample was evenly divided by gender (53% female). The large majority of participants were black (90%) and the remaining 10% were Hispanic. Most participants received either free (53%) or reduced price (23%) lunch.

□ 2007-2008 LMD Foundation; <http://www.lmdfoundation.org/>

Math & Science Achievement Prior to L&E

The average math and science grades for L&E students prior to the program were well below average. L&E students were also much less likely to meet basic standards on standardized tests, prior to the program.

	L&E Students	All Bear Creek 8 th Graders	All Creekside 11 th Graders
Course 1 Grades Fall 0708			
Math	68	75	78
Science	73	79	79
CRCT Performance Levels Spring 0607 (8 th graders only)			
Math ('Does not Meet Standard')	87%	43%	--
Science ('Does not Meet Standard')	80%	44%	--

Note. CRCT=Criterion Referenced Competency Test

Selection of Matched Comparison Students

For each L&E participant a comparison student was selected who was in the same math and science class during the Fall and Spring semesters of the 2007-08, and who had a similar achievement in math and science. The analyses below contrast change in math and science achievement after the program for L&E and comparison students.

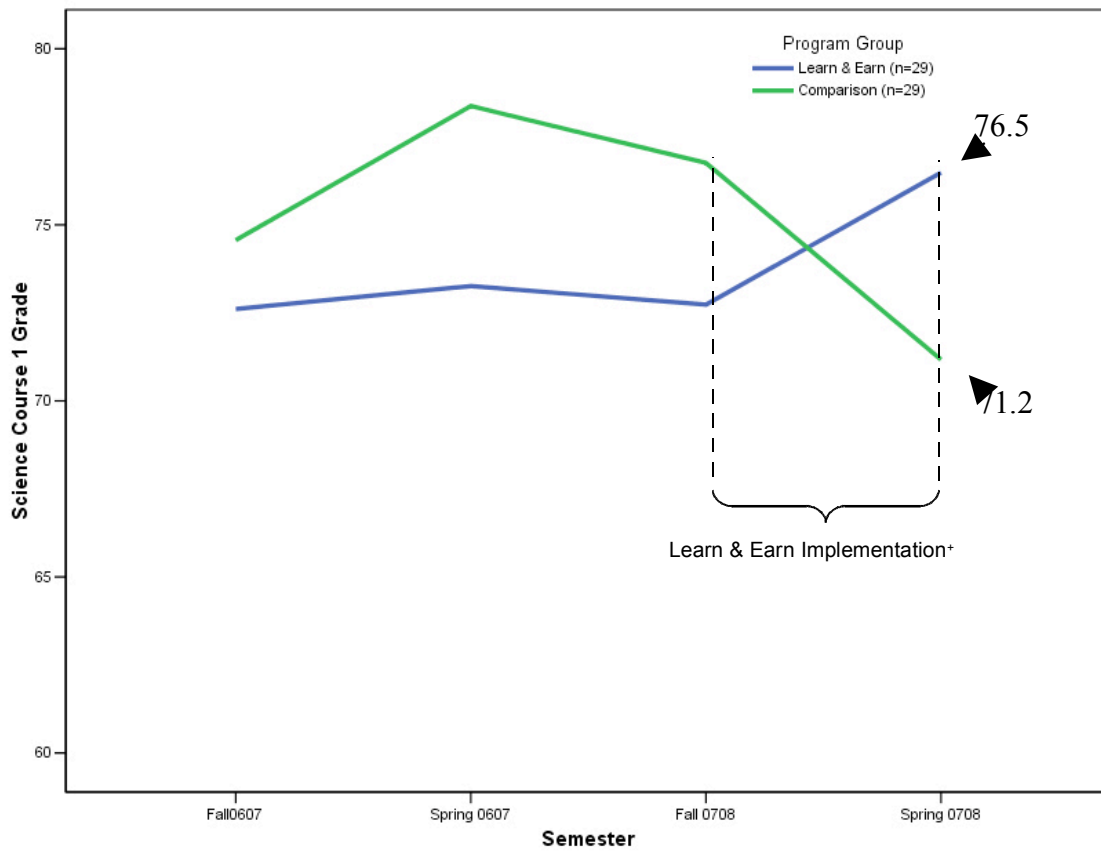
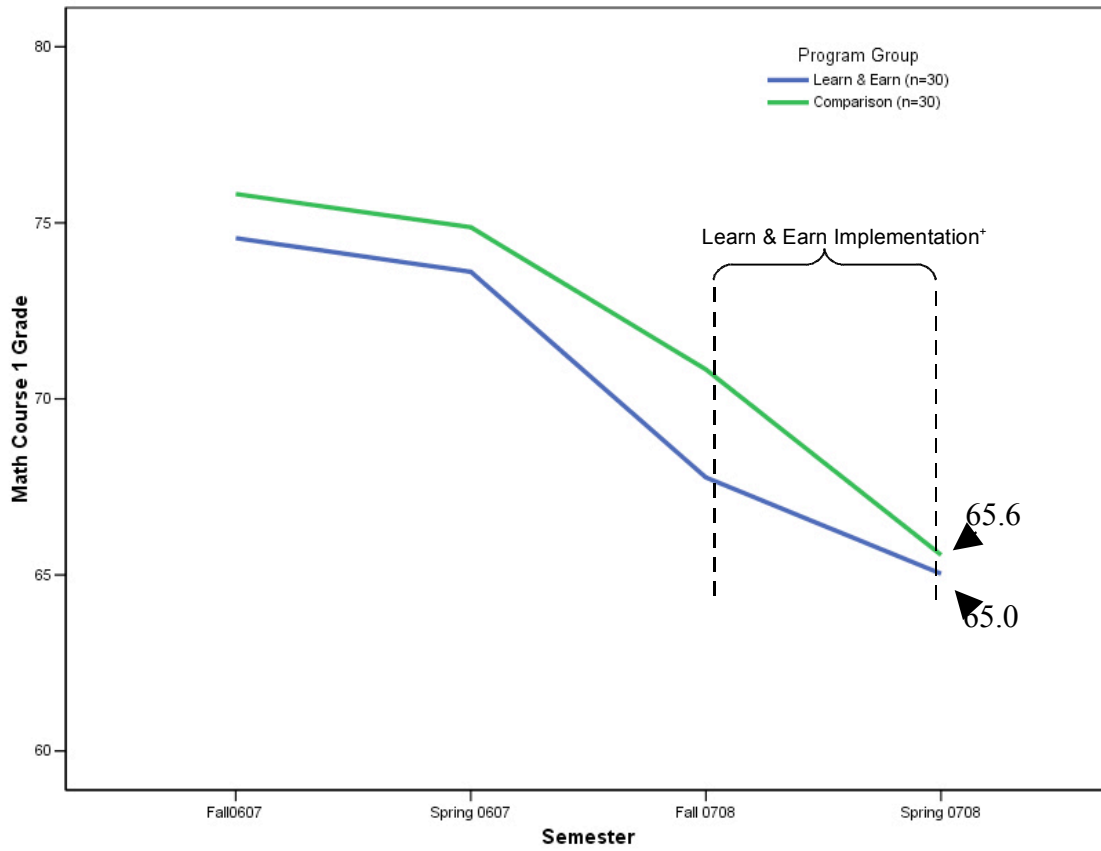
Program Effects on Math & Science Grades

Math: As shown in the figures below, average math grades declined over the three semesters preceding Learn & Earn implementation for Learn & Earn students. There was a similar decline for comparison students. However, Learn & Earn students demonstrated an easing of the decline in Spring semester 2008 that did not occur for comparison students.

Science: L&E students' science grades were very stable over the first three semesters, and consistently lower than comparison students. However, after participating in the L&E program, L&E students demonstrated a marked increase in science grades at the same time that comparison students' grades showed a considerable decline.

The pattern of change over time in both math and science grades differed significantly ($p < .05$) between L&E and comparison students. For both subjects, comparison students' grades tended to become increasingly worse over time. In contrast, the science grades of L&E students improved markedly in Spring 2008, and their math grades declined less than they had previously (see figures below).

Average Math & Science Grades for L&E and Comparison Groups



* Learn & Earn ran from January to April 2008

Program Effects on Math & Science Grades (cnt'd)

Number of Students with Grade Improvements in Spring 2008

	Math		Science	
	Improve	Improve > 4 pts	Improve	Improve > 4 pts
L&E	14 (47%)	11 (37%)	14 (48%)	11 (38%)
Comparison	9 (30%)	2 (7%)	7 (24%)	4 (14%)

Program Effects on Standardized Tests

Although a small percentage of L&E students met minimum standards in math and science on the CRCT in Spring 2008, it was a slightly larger percentage for math than in the previous year, whereas the school percentage meeting math standards decreased.

*Criterion-Referenced Competency Tests (CRCT) – Percentage Meeting Standards**

	n	Math		Science	
		2007	2008	2007	2008
L&E	14	14%	27%	21%	7%
Bear Creek 8 th Grade	338	57%	50%	56%	34%

Among high school students, a larger percentage of L&E students met minimum standards on the math GHSGT than in the population of 11th graders at Creekside (below).

Georgia High School Graduation Tests (GHSGT) – Percentage Meeting Standards

	n	Math	Science
L&E	14	93%	79%
Creekside 11 th Grade	411	85%	82%

* Includes students who met or exceeded standards, for both CRCT and GHSGT tables.

Focus Group Results

The thirty program graduates were divided into four focus groups and a separate focus group was conducted for L&E instructors. The purpose of these groups was to elicit discussion of participants' experiences in the program. Each group lasted approximately one hour and was facilitated by an EMSTAR researcher.

Students and teachers reported they felt the program was successful at increasing students' knowledge in math and science. Students and teachers also reported an increase in students' sense of efficacy and enjoyment in math and science, and school in general. One student said, *"I don't feel stupid anymore. It actually works if you pay attention."* Another stated, *"At first I didn't like school, but now that I am bringing up my grades, I like school more and want to go to high school and college."*

Students and teachers also reported that while the stipend served as motivation, it was not the primary motivator because long-term participation required intrinsic commitment. Students reported being very engaged and placing great value on participating in the program. Both students and teachers reported that the program provided an environment that was more supportive of learning than a traditional classroom because of the lower teacher-student ratio. This created:

- An opportunity for more one-on-one interaction between students and teachers
 - *"In the program they try to help you; in class you either get it or you don't."*
- An environment in which teachers used innovative techniques
 - *"You don't realize that you are really learning. I wish my regular class was like this."*
- An atmosphere in which students felt comfortable asking questions
 - *"I don't participate in class because I feel like people are going to laugh at me. But I participate more in after school because you can ask questions and the people around you are in the same situation."*
- A climate in which students felt that teachers cared about their personal and academic success.
 - *"You've got people who actually care about the students' success and it's not just a paycheck – and that comes out to the students."*

Students felt the program was beneficial academically and interpersonally. Teachers also reported that this experience was personally rewarding. Students and teachers suggested the program should last the entire school year enabling teachers to establish a foundation for learning before students' achievement had fallen too far. Students also suggested the program include more subjects (i.e. Language Arts). Almost all teachers and students wanted the program to continue for these students into the next school year. All teachers felt the students' future academic success was dependent on their continued involvement.

Discussion

Quantitative data (grades and standardized tests) and qualitative data (focus groups) both provided positive, if not unequivocally consistent, results. Prior to participating in the program, Learn and Earn students showed trends in grades that were equal to or more negative than the trends for comparison students. However, after participating in the program, the trends for Learn and Earn participants were more positive than those for comparison students. This effect was most pronounced for science grades. Standardized test scores also showed some positive effects, though these results were less consistent than for grades.

Focus groups provided insight into the meaning of the program for participants. Students reported a more positive attitude about their academic experience, particularly with respect to math and science, and were optimistic about their abilities to improve further in the future. They attributed much of this effect to the encouragement and support they received from their fellow students, and particularly from their teachers. These relationships helped to provide motivation and commitment to the program. While the financial incentives served to attract students to the program, the rewards associated with success and positive support from others were more important in keeping students engaged in the program over its duration.

It should be noted that changes such as those intended, and to some extent achieved, are very difficult. The students chosen for participation were among the lowest achieving at their grade level. Such low achievement would likely have attracted the attention of school faculty and staff, as well as parents, and been the stimulus for previous attempts to improve their performance. Low academic achievement tends to create a downward spiral. Failure to learn what is expected in one semester or year makes it difficult to absorb the material presented in the classes which follow. Thus, reversing this trend in one semester, in even modest ways, represents a substantial accomplishment. It is likely that the continuation of this intervention over a longer period of time would build upon the success which has been achieved to date.

It appears that the Learn and Earn approach is promising. Results of this study suggest that providing financial incentives to students provides an initial motivation to attend after-school tutoring. The relationships formed in this setting, along with encouragement and support, provide additional commitment to this process. Grades, and to some extent, test scores reflect the benefits of this program for participants. Although sample sizes were relatively small, and the time-frame of this study was limited to the semester of the program (as opposed to long-term follow-up), the Learn and Earn approach does appear to be beneficial for its participants. If these gains can be maintained, the investment associated with this program is very likely to be returned several times over in terms of higher achieving students who become more productive citizens.