

Do student incentive and reward programs foster student achievement?

(Intersections: Student Learning with School Processes and Perceptions)

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Abstract

The focus project studied the following question, “Do student incentive and reward programs foster student achievement?” The primary measures of student data emphasized the intersections of Student Learning with School Processes and Perceptions. Measurements of student learning included PSSA scores (for Grade 8) and summative assessments, as indicated by quarterly grade point averages (for the entire student body). The data were tracked from three perspectives: scoring with no formal recognition program; scoring with a reward program; and scoring with a formal incentive program. Students participating in the recognition activities completed student perception surveys. Preliminary findings suggest school sponsored recognition programs raise student achievement. Further analysis from the current testing cycle will follow when scoring data are released in the fall.

Problem

The impetus for the study initially arose not from how incentives would raise student achievement but merely how time and energy were expended in relationship to number of students and nature of interactions—whether positive or negative. Many educators invest a majority of time and effort into a minority of students. Students at the extreme ends of the ability spectrum (special needs or gifted) tend to receive additional attention beyond that of the majority of students in the middle; likewise, the minority of students with behavioral issues consume more administrative energy than the majority of the students who adhere to school guidelines. Such disproportionate expenditures in educational resources parallel the disproportionate economic inputs as described by Pareto’s 80/20 principles. (Koch, 1998)

Educational leaders could learn from their business counterparts on more effective management principles.

As our school endeavored to equalize some of these disparities, we implemented a system to reward those behaviors—both academic and behavioral—that we wanted students to exhibit. Simply recognizing students for what they accomplished, beyond the standard academic honor roll and athletic awards, became a focal point. In essence, the problem lay not with what the students were doing, but with what the staff was not doing. The goal became how to maximize the positive elements of the school while at the same time to minimize occurrences of the negative. At this point the strategy required active incentives replacing passive rewards applied after the fact. The plan required creating programs (School Processes) to raise student morale (Perceptions) with the subsequent intent of raising student performance (Student Learning).

Method

The initial information needed for the study lay in the PSSA results. The specific nature of the question required examination of data from three perspectives: scoring with no expectation of reward (a field trip as reward with no advance knowledge); scoring with the knowledge of a prior reward (a field trip as a repeat reward); and scoring with advance announcement of the reward (a field trip as incentive). The web-based tools available through “Data Interaction for Pennsylvania Student Assessments”, eMetric, provided the necessary historical data for comparison. (See Appendix A)

Consistent with Bernhardt’s emphasis on multiple measures of student data, quarterly grade point averages formed a second avenue for information analysis. Student achievement must be measured in multiple capacities. For the purposes of this study, student achievement reflected more than just attaining “Proficiency” on standardized tests; it included progress demonstrated in quarterly grades. The use of complementary data—GPA—to the PSSA tests paralleled the implementation of additional reward trips and provided measurable data during the period of the study.

In addition to the numerical PSSA and GPA data, student perception surveys were administered based on the following:

- ◆ 2009 PSSA Students (Class of 2013) eligible for inaugural, 2009 reward trip;
- ◆ 2010 PSSA Students (Classes of 2011 and 2014) eligible for 2010 reward trip;
- ◆ 2011 PSSA Students (Classes of 2012 and 2015) eligible for 2011 reward trip;
- ◆ 2010 GPA Improvement Students (All grades) eligible for 2nd term reward trip; and
- ◆ 2010 GPA Improvement Students (All grades) eligible for 3rd term reward trip.

Each survey followed the same format (see Appendices). The surveys were designed to measure the effect of the reward trips on student performance on the assessments and the effect of the reward trips in creating a positive learning atmosphere.

Results

Educators often fail to maximize simple psychological principles when engaging students. In designing programs to advance student achievement, operant conditioning offers viable principles for educators. B. F. Skinner’s work describing operant conditioning as a technique in using positive reinforcers to change behaviors formed the foundation of the approach. (Kasschau, 2003) A reward trip or activity was the positive reinforcer; increased performance was the desired outcome. The results reveal that when used as part of an incentive program increase rewards will raise student performance.

The first step for the project required raw data with no reward system in place. Scaled scores from the PSSA tests administered in 2009 provided a starting point. Grade 8 students who scored proficient in all 4 PSSA subject areas were invited to attend a special field trip (miniature golf) in the fall; 25 of 43 students who tested qualified (58%). This spring twenty of those same students completed perception surveys (Appendix B) on their experience. The following represent key findings from the surveys:

- ◆ 50% believe they will work harder on the PSSA test next year Juniors to qualify for a reward trip;
- ◆ 75% believe trips and activities help create a positive school atmosphere; and
- ◆ 80% believe a positive school atmosphere creates a better learning environment.

As the first group of students to participate in the reward program, the Class of 2013 saw the benefits of such a program.

The next group of students, the Class of 2014, completed their 8th PSSA tests in the spring of 2010. Their results improved over their predecessors. (Appendix A) Though the

previous class had taken the trip, no announcement was made that such a trip would be taken again. Some, 22%, knew they would be invited since the grade before them had gone; 75% of those worked harder on the PSSA test in order to be invited. Of those unaware of the forthcoming invitation, 60% responded that knowing about the trip would have encouraged them to do better on the PSSA. Fourteen of the thirty-nine testing students qualified; this represented a slight decrease over the prior year. (See Appendix C)

The final perspective in relating school process to student learning dealt with students who just took the PSSA tests this spring. They completed a perception survey prior to taking the tests. (See Appendix D) The students clearly expect the trips consider—92% yes to 8% no. Most significantly, however, was their intent to work harder on the PSSA tests to qualify for the trip (56% yes, 36% somewhat). The scores, once released this summer, may validate their intentions.

The PSSA scores established the criterion for the first of the reward trips—we want to see, and reward, a specific level of achievement. The second set of trips was based on an individual improvement as represented on quarterly GPA—we want to see, and reward, achievement across all levels. The first trip, to a nearby ice skating rink, took place in the 2009-2010 school year using improvement from the 1st to 2nd quarter GPAs as criterion. A 2% increase qualified students to be invited; 29 were invited (roughly 10% of the students). This trip, like the first year of the PSSA golf outing, was strictly a reward as no one knew in advance. This year a 2% increase again qualified students to attend the reward trip. The number of students, however, increased to 42. In responding to a perception survey (see Appendix E), a

majority (79%) did not know about the trip in advance yet an even greater number (88%) would have worked harder if they had known. An equal number stated they would work hard to be invited if a second trip were to be taken the next marking period.

To test if the reward trip genuinely served as a positive reinforcer to encourage behavior (as per operant conditioning), announcements were made about a reward trip based on improved GPAs from second to third term. Seventy-two students (24%) qualified for the trip. We observed several significant facts from surveys completed by this group of students:

- ◆ The percentage of eligible students continues to rise (1st trip: 10%; 2nd trip 14%, 3rd trip 24%);
- ◆ Students attribute the reward trips as a motivator to raising grades (See Appendix F);
- ◆ A positive school atmosphere creates a better learning environment; and
- ◆ Being recognized for achievement encourages students to achieve.

This most recent trip included more students than any before. Perhaps more importantly, though, it engaged students who may otherwise not be recognized. By using student-based improvement on an individual basis, the school has succeeded in reaching a segment of the student population heretofore overlooked.

In summary, the reward trips undoubtedly have impacted the students. The increase in PSSA scores parallels the introduction of the trips; however, the study addressed only perception issues associated with the trip and not all possible variables influencing increased scores. A clear correlation exists, though no exclusive causation. Furthermore, the trips have supplemented other morale-boosting efforts to create a more positive learning environment. (Appendix G)

Conclusion

As the reward trips continue, a regular monitoring of student performance will be necessary. No plan or program can stand alone to guarantee student achievement. Testing proficient on PSSA or raising quarterly GPA as criterion for a reward trip serves as a starting point to recognize student effort. The incentive program described on this research project represent only a portion of the efforts the school has undertaken to raise school morale, thus hoping to raise student achievement. For example, the discipline system is currently under review for effectiveness as well and has been the subject of another graduate student’s focus project. (Anderson, 2010)

In addition, a thorough analysis of student/time ratio could be implemented utilizing Pareto’s 80/20 principles. Do educators maximize the limited time and resources available? Do we distribute those resources equitably and with the greatest efficiency?

Also, additional work and study needs to be applied toward individual teacher/student interaction. Orszulak (2007) describes the importance of “Focused Encouragement” in dealing with “tough kids”, but the principle should extend to all students. He contends that “people who look for the good things kids do will find them.” (Orszulak, 71) The impact of negative reinforcement will also need to be examined. Would student achievement rise if those scoring below proficient enroll in a mandatory remediation class in lieu of an elective? What impact does PSSA proficiency as a graduation requirement have on performance?

This focus project represents not a conclusion of a study but the beginning of professional evaluation for advancing student achievement.

References

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Appendix A
PSSA Test Results

	Reading		Mathematics		Reading		Mathematics		Reading		Mathematics	
	BB/B	P/A	BB/B	P/A	BB/B	P/A	BB/B	P/A	BB/B	P/A	BB/B	P/A
	Class of 2013				Class of 2014				Class of 2015			
8 th PSSA %	18.6	81.4	30.2	69.8	13.1	86.8	18.4	81.6	Data available summer 2011			
7 th PSSA %	Data not applicable				28.9	71.1	34.3	65.7	35.1	64.8	18.9	86.1
6 th PSSA %	Data not applicable								36.6	63.4	28.6	71.4

Comments about data analysis

- ◆ Scale Scores from tests administered 2009 and 2010; 2011 scores available in summer
- ◆ Only Reading and Mathematics scores allowed for longitudinal analysis; Science and Writing scores not applicable
- ◆ Performance levels groupings combined Below Basic with Basic (BB/B) and Proficient with Advanced (P/A) to match eligibility for reward trip
- ◆ Longitudinal comparison of grade tracking shows consistent improvement with grade level progression
- ◆ Latitudinal, or snapshot, comparison shows improvement in three of four subject areas (8th grade Reading, 8th grade Mathematics, and 7th grade Mathematics)

Appendix B
Student Perception Survey – 2009 PSSA
(N=20, Results)

In order to help us plan activities and programs for Oswayo Valley students, please take a few minutes to answer these questions about the field trip to GARY’S PUTTER WORLD last year.

You were part of the first group invited to attend the golfing trip because you scored proficient on all of your PSSA tests. You did not know about the trip before taking the tests. If you had known it, would you have worked harder to do better on the PSSA tests?

- Yes (45%) Somewhat (35%) No (20%)

Next year, as Juniors, you will take the PSSA again. Knowing we have started this recognition program, will work harder to do better on the PSSA tests to get invited to another trip?

- Yes (50%) Somewhat (40%) No (10%)

Do trips and activities like miniature golf help create a positive school atmosphere?

- Yes (80%) Somewhat (20%) No (0%)

Does a positive school atmosphere create a better learning atmosphere?

- Yes (75%) Somewhat (25%) No (0%)

Do trips and activities like miniature golf show the school’s effort to recognize your work and achievement?

- Yes (95%) Somewhat (5%) No (0%)

Does being recognized encourage you to achieve more?

- Yes (50%) Somewhat (50%) No (0%)

Appendix C
Student Perception Survey – PSSA 2010
(N=37/14 [all students / 8th], Results All students / 8th)

In order to help us plan activities and programs for Oswayo Valley students, please take a few minutes to answer these questions about the field trip to GARY’S PUTTER WORLD last fall.

You were invited to attend the golfing trip because you scored proficient on all of your PSSA tests last year. Did you know this reward would be given before you were invited?

Yes (22% / 29%)

If YES, did knowing about the trip encourage you to do better on the PSSA tests?

Yes (50% / 75%) Somewhat (35% / 0%) No (13% / 25%)

No (78% / 72%)

If NO, would knowing about the trip have encouraged you to do better on the PSSA tests?

Yes (31% / 60%) Somewhat (45% / 40%) No (21% / 0%)

Do trips and activities like miniature golf help create a positive school atmosphere?

Yes (84% / 79%) Somewhat (14% / 14%) No (2% / 7%)

Do trips and activities like miniature golf show the school’s effort to recognize your work and achievement?

Yes (89% / 93%) Somewhat (5% / 7%) No (5% / 0%)

What ideas or suggestions do you have to create a positive and constructive learning experience at OV?

Appendix D
Student Perception Survey – PSSA 2011

In order to help us plan activities and programs for Oswayo Valley students, please take a few minutes to answer these questions about the PSSA tests.
(N=69/33 [all students] / [8th], **Results All Students / 8th**)

For the last two years, the school recognized the students who scored proficient on all their PSSA tests with a field trip (*to GARY'S PUTTER WORLD for miniature golf*) at the start of the school year. Do you expect the same—or similar—reward for your class?

- Yes (96% / 92%) No (4% / 8%)

If the school sponsors this trip for you, will you work harder to do well on the PSSA tests? *Be honest.*

- Yes (64% / 56%) Somewhat (29% / 36%) No (7% / 8%)

Do trips and activities like miniature golf help create a positive school atmosphere?

- Yes (62% / 58%) Somewhat (33% / 36%) No (4% / 8%)

Do trips and activities like miniature golf show the school's effort to recognize your work and achievement?

- Yes (86% / 86%) Somewhat (12% / 11%) No (2% / 3%)

What ideas or suggestions do you have to create a positive and constructive learning experience at OV?

Appendix E
Student Perception Survey – 2010-2011 2nd Marking Period GPA
(N=42/8 [all students] / [8th], Results All Students / 8th)

In order to help us plan activities and programs for Oswayo Valley students, please take a few minutes to answer these questions about the field trip to the ICE SKATING RINK last week.

You were invited to attend the Ice Skating trip because you showed improvement on your report card from Marking Period 1 to Marking Period 2. Did you know this reward would be given before you were invited?

- Yes (21% / 0%) No (79% / 100%)

If you had known at the beginning of the marking period, would that have influenced you to work harder to raise your grade average to be able to go?

- Yes (88% / 88%) No (12% / 12%)

If we have another reward trip based on Marking Period 3, how likely would you be to work harder on your grades to be able to go?

- More likely (83% / 88%) No effect (14% / 12%) Less likely (2% / 0%)

Do trips and activities like Ice Skating help create a positive school atmosphere?

- Yes (85% / 67%) Somewhat (13% / 23 %) No (2% / 0%)

Do trips and activities like Ice Skating show the school’s effort to recognize your work and achievement?

- Yes (97% / 100%) Somewhat (7% / 0%) No (0% / 0%)

What ideas or suggestions do you have to create a positive and constructive learning experience at OV?

Appendix F
Student Perception Survey – 2010-2011 3rd Marking Period GPA
(N=63/9 [all students] / [8th], Results All Students / 8th)

In order to help us plan activities and programs for Oswayo Valley students, please take a few minutes to answer these questions about the field trip to OV LANES.

You earned this field trip because you improved your 3rd marking period grade. This reward trip was announced in March. Did you work harder to raise your grades so you could go on the trip?

- Yes (52% / 44%) Somewhat (24% / 44%) No (24% / 12%)

Do trips and activities like going bowling help create a positive school atmosphere?

- Yes (75% / 44 %) Somewhat (24% / 56%) No (2% / 0%)

Does a positive school atmosphere create a better learning atmosphere?

- Yes (78% / 89%) Somewhat (22% / 9%) No (0% / 0%)

Do trips and activities like going bowling show the school’s effort to recognize your work and achievement?

- Yes (78% / 56%) Somewhat (21% / 44%) No (2% / 0%)

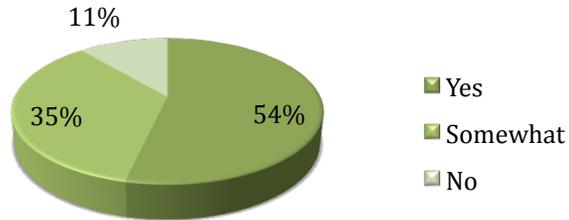
Does being recognized encourage you to achieve more?

- Yes (63% / 56%) Somewhat (32% / 44%) No (5% / 0%)

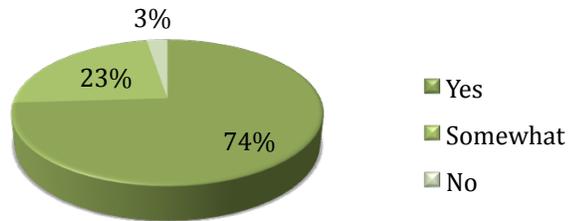
What ideas or suggestions do you have to create a positive and constructive learning experience at OV?

Appendix G

Would you work harder on the PSSA tests to get invited to go on a reward trip?
(N=126)



Do reward trips help create a positive school atmosphere?
(N=231)



Does a positive school atmosphere encourage you to achieve more?
(N=83)

