



Austin Independent School District

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TEXAS ACCELERATED SCIENCE ACHIEVEMENT PROGRAM: SUMMARY REPORT, 2005-2006

INTRODUCTION

In 2005-2006, the Texas Education Agency funded the Texas Accelerated Science Achievement Program (TX ASAP) for \$150,000 at Austin ISD's Crockett, Lanier, and Reagan high schools. The TX ASAP grant targeted students in 9th through 12th grades who were struggling to pass their science courses and/or the TAKS science test. Staff on each campus determined the needs of their students and developed a menu of activities to fit those needs. In general, program services included a variety of intensive after-school and summer school science instruction programs, which were implemented to varying degrees at the individual schools. Each campus implemented summer, fall, and spring programs. Though the TX ASAP program originally targeted struggling students, all three schools opened the program to additional students based on space availability.

After participating in the program, students' progress was measured by changes in science course grades for all participants and by changes in TAKS Science performance for 10th and 11th graders. In addition, student attitudes were examined through surveys administered in the fall and spring semesters. Reports from campus staff indicate that at least 200 students participated in some form of the TX ASAP at Crockett, Lanier, and Reagan high schools.

DESCRIPTION OF PROGRAMS

CROCKETT HIGH SCHOOL

Crockett conducted the most comprehensive of the three programs in 2005-2006. The most intensive component of Crockett's program was the Summer Science Institute (SSI), which ran from June 20—July 1, 2005. The institute paired high-achieving 11th grade students with 10th graders at various achievement levels. Thirty students participated in total. The SSI provided field experiences and guest speakers for students and assigned an independent research project focusing on a local environmental issue. Each student received a credit in Environmental Science upon completion of the institute. Local universities supported the SSI by organizing tours of

laboratories and research facilities, offering lectures by professors, and providing tutoring. Several professors from the University of Texas (UT) donated their time to teach during the SSI. They designed and implemented their own learning activities with the students, and the Environmental Science Institute at UT hosted outreach lectures for TX ASAP participants. St. Edwards University provided tutors, and Texas State University sponsored the Edwards Aquifer Study day, hosted by the Edwards Aquifer Research Center. Texas A&M at Corpus Christi gave students a tour of laboratory facilities and the campus. The University of Texas Marine Science Institute students hosted a tour of a UT research vessel.

In addition to the SSI, Crockett held a biology credit recovery program in the summer of 2005 to help students who did not pass biology in the 2004-2005 school year get back on track for graduation. Crockett used TX ASAP funds to pay teachers to work with students for two weeks during the summer to create an individualized credit recovery plan. The students worked on a self-paced program to master individual six-week material and to recover science course credit. Students were allowed to recover credit for up to three six-week periods.

From Fall 2005 through Spring 2006, Crockett created a science club, funded by TX ASAP, which served 73 students. Students from the SSI attended meetings of the Crockett Science Club. The club sought to increase student interest in science by

having students design their own science learning experiences. They held meetings every other Tuesday after school, elected officers, worked on fundraisers and service projects, and organized events. These events included UT outreach lectures, Saturday field trips, and work with an elementary class to design TEKS-based (Texas Essential Knowledge and Skills) lessons. These types of experiences were intended to increase student interest in science, to increase TAKS knowledge through the process of lesson design, to create connections with the community, and to expose students to real world science connections.

One-on-one science instruction was another major aspect of TX ASAP at Crockett. Students who were failing science courses and who previously failed the TAKS science section worked with an Evening Academy Science Specialist. The specialist was responsible for designing self-paced TAKS review materials that Crockett would keep as a resource after the grant expired. Crockett's TX ASAP staff also hired college tutors to work with struggling science students. In addition to providing one-on-one instruction, these tutors acted as mentors, presenting students with the opportunity to interact with successful university students.

LANIER HIGH SCHOOL

Based on the results of a student needs assessment, the Lanier 2005-2006 TX ASAP focused on academic support. TX ASAP funds supported the Lanier Science Credit Repair Program in Summer 2005, enabling

students to improve one or two of their previous six-week grades and to earn credit for their science class taken during the 2004-2005 school year. Lanier's 9th grade science teachers designed the Science Credit Repair Program based on a previous curriculum that included laboratory sessions, a technology component, and an assessment tool to ensure that students acquired appropriate knowledge. Students took from one week to a month to repair their grades. Upon completion of the program, students' grades were changed from failing to 75 (passing). The Science Credit Repair Program continued into the Fall 2005 semester, using the same curriculum that was developed for the summer program. Forty-four students took part to gain credit in Biology, Integrated Physics and Chemistry (IPC), and Chemistry courses.

During the fall and spring semesters, Lanier's TX ASAP staff used AISD Benchmark tests, six-weeks exams, TAKS, and the UT TRACK (TAKS Readiness And Core Knowledge) program to continue assessing students' level of knowledge and achievement in science. To support science achievement, Lanier began a tutoring program that took place three days a week for one hour before and after school in Biology, IPC, and Chemistry. TX ASAP staff used a variety of instructional materials to reach students, such as the SMART board, Quizon Game Technology, Science Literacy, AP lab equipment, and field guides. The book *Math Made Real* was used to help students interpret numeric charts and graphs. Lanier partnered with the Charles A.

Dana Center at the University of Texas in developing curriculum for biology courses.

Lanier also provided activities to promote science enrichment. In the summer of 2005, Lanier's TX ASAP held a two-day event called the Lanier Science Circus. The Science Circus introduced 29 incoming freshmen to the world of science by introducing them to their new science teachers and the Lanier Science Club, and by holding presentations from various science professionals. In November 2005, Lanier held a presentation by special effects expert Steve Wolf called "Science in the Movies," which showed students how basic science is integral to his work in creating special effects for TV shows and movies.

REAGAN HIGH SCHOOL

The TX ASAP at Reagan served students needing specialized academic support in science. In Summer 2005, 45 students with limited English proficiency (LEP) participated in one of two summer camps supported by TX ASAP. The TAKS Camp offered instruction to students who failed the TAKS science test. The 9th Grade Transition Camp sought to promote interest in and motivation for learning science among incoming freshmen.

During the 2005-2006 school year, the TX ASAP facilitator used the UT TRACK system for student diagnostic purposes and TAKS preparation. Students who participated in a summer camp were eligible for tutoring services. These services were limited, however, because the campus experienced difficulty in obtaining approval for expenditures for instructional materials

and laptop computers. Parent outreach services were provided for students participating in IPC and Chemistry course credit repair classes. Science teachers at Reagan participated in professional development sessions focused on incorporating literacy skills in the science classroom.

METHODOLOGY

EVALUATION OBJECTIVES

The purpose of TX ASAP was twofold: (a) to improve science academic achievement and (b) to increase student interest in science. To measure these goals, this program evaluation examined TAKS science scores, science course grades, and students' attitudes toward science. In combination, these measures provided project decision makers with the information necessary for making future implementation decisions at schools that suffer from poor science achievement.

DATA COLLECTION

The following data sources were used to evaluate the program:

- **Student Achievement Data:** TAKS science test and science course data obtained through district student information systems were used to assess the academic achievement of students participating in the TX ASAP program.
- **TX ASAP Participation Data:** Each campus provided program records to document student participation in program services.

- **Science Attitudes Surveys:** These surveys helped determine whether students were sufficiently motivated to learn about science at the high school level. They measured student attitudes regarding science education, such as whether they found it useful or interesting, and student feelings of self-efficacy about science, such as whether they felt confident about mastering science concepts and succeeding in their classes. Students enrolled in science courses at Crockett and Lanier (TX ASAP participants and non-participants) completed these surveys in the fall and spring semesters.
- **Student Focus Group:** In Fall 2005, 11 SSI students at Crockett participated in focus group interviews to help identify important outcomes of the institute.

DATA ANALYSIS

A mixed methods approach was used to evaluate TX ASAP. Quantitative and qualitative data were collected and analyzed. Quantitative data from Crockett and Lanier high schools were analyzed to describe the impact of TX ASAP on students' science achievement (TAKS science test and science course grades). Program Evaluation staff merged the program participation data collected from TX ASAP staff at Crockett and Lanier with AISD student records. Simple descriptive statistics were calculated for TAKS science scores and science course grades, based on the students' type of participation in TX ASAP. Where possible, inferential statistics were used to estimate group mean differences. Qualitative

information from program meetings, site visits, focus groups, and state progress reports also were used to describe program implementation and impact. Due to the small number of program participants and limited program implementation levels, Program Evaluation staff determined that it was inappropriate to include Reagan student data within these analyses.

LIMITATIONS OF EVALUATION

Complications with the participant data limited the ability of Program Evaluation staff to conduct a thorough quantitative outcomes examination. TX ASAP data did not indicate the full extent of each student's participation in the various camps, clubs, credit recovery programs, and presentations—all of which were available to all students, not just struggling science students. This circumstance makes it difficult to create a meaningful standard by which to define TX ASAP participation and suggests that related analyses be interpreted with caution. Nevertheless, this analysis considers the SSI at Crockett, all other Crockett ASAP participation, and the Lanier summer programs as the three main categories of comparison.

RESULTS

This evaluation of TX ASAP at Crockett and Lanier revealed few statistically significant results. As explained above, due to widely varying levels of participation in TX ASAP within each school and to the “open door” policy that allowed any student to participate, it was

difficult to isolate the specific effects without diluting the sample to the extent that the results became meaningless. The results shown here provide a simple description of the performance of the students who participated in at least some part of TX ASAP.

CROCKETT HIGH SCHOOL

The surveys and focus groups conducted at Crockett addressed students' attitudes and levels of interest relating to science. The survey results offered encouraging signs about student attitudes. At least 75% of Crockett survey participants agreed that they enjoyed science and felt capable of mastering its concepts. In the focus group conducted in Fall 2005, students reported that their SSI experiences were fun and interesting. The hands-on experiences challenged the students intellectually and provided them with a better understanding of the concepts. Students reported that they wanted additional opportunities to participate in similar activities throughout the school year and would recommend that their friends participate. Twenty-nine of the 30 SSI participants continued to participate in TX ASAP in the fall and spring semesters.

Crockett's TAKS science test results were compared according to three types of student participation: SSI, fall and spring TX ASAP, or no participation. Twenty-five of Crockett's 10th and 11th graders from the 2005 SSI scored an average of 102 points higher on the 2006 TAKS Science section than did Crockett students of the same grades who did not participate in any TX

ASAP services (Table 1). Seventy Crockett students who participated in the fall or spring TX ASAP had an average TAKS Science score 60 points higher than that of non-TX ASAP students. However, the 11 students who took both the 2005 and 2006 TAKS science sections and who participated in the 2005 SSI scored an average of 2294

on the 2005 TAKS (all passing). That score was approximately 200 points higher than the average for all Crockett 10th graders in 2005 (2091). This may have indicated that some of the SSI participants were less in need of supplemental science instruction than were the students for whom the program was originally intended.

Table 1. Crockett TAKS Science Results, Grades 10-11, By TX ASAP Participation

Type of ASAP Participation	Mean 2006 TAKS Science Scale Score	2006 TAKS Science Passing Rate
Fall/Spring TX ASAP participation (no SSI) (N = 70)	2191	79%
Summer Science Institute (N = 25)	2232	76%
No ASAP/SSI participation (N = 752)	2130	58%

Sources: District TAKS files and TX ASAP program participation records, August 2006

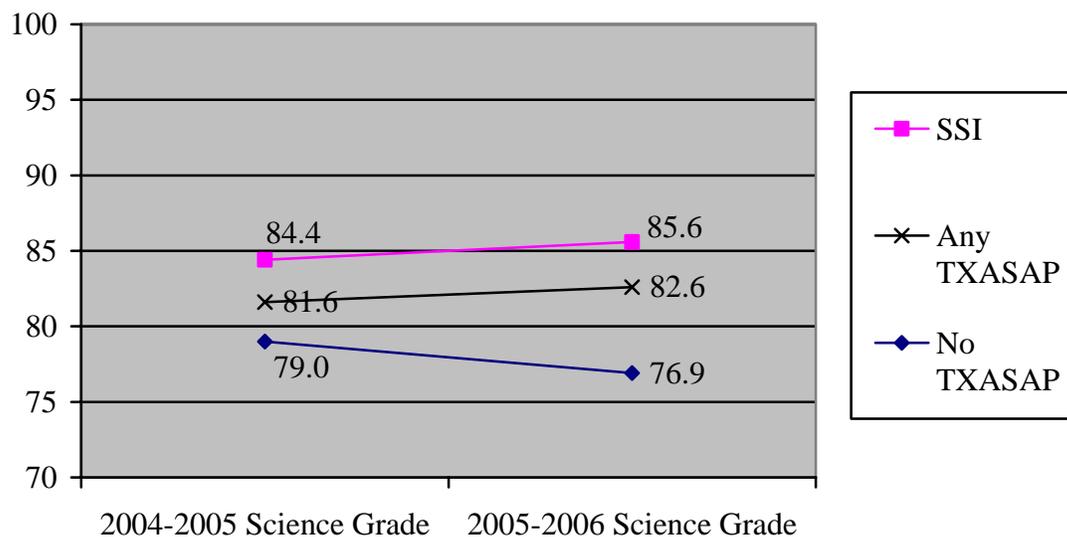
A comparison between science course grades from 2004-2005 and from 2005-2006 shows a 1-point increase among students who participated in TX ASAP at Crockett in 2005-2006 (Figure 1, below). The TX ASAP students, however, were already performing better than other students in 2004-2005, as evidenced by the higher 2004-2005 average grade for SSI (84.4) and other TX ASAP students (81.6) compared with all other students (79.0). Like the TAKS results

above, these results suggest that SSI and other TX ASAP activities at Crockett may not have reached as many struggling students as they intended. The 2-point decrease in the average science grade among non-TX ASAP participants, compared with the slight increase among TX ASAP participants, may be attributable to two factors. One possible factor is the TX ASAP itself, which may have helped participating students improve their grades while other

students regressed slightly. Another contributing factor may be the preponderance of 11th graders among non-TX ASAP participants. Eleventh graders represented 48% of non-TX ASAP participants and 28% of TX ASAP participants. Most of these non-participating 11th graders received slightly lower grades in the more rigorous 11th grade Chemistry

and Physics courses than they did in their 10th grade Integrated Physics and Chemistry (IPC) courses. Thus, due to the different types of science courses taken at different grade levels and to the minor differences in grade changes, it is difficult to identify the specific effect of TX ASAP participation on students' performance in science courses.

Figure 1. Crockett HS, Change in Science Grades from 2004-2005 to 2005-2006, Based on TX ASAP Participation Type



Sources: AISD course enrollment and grade files and TX ASAP participation records, August 2006

LANIER HIGH SCHOOL

The results of the TX ASAP surveys offered encouraging signs about Lanier students' attitudes toward science. At least 70% of Lanier survey participants overall said they agreed that science was important, fun, and interesting, and that they wanted to understand it better. Eleven out of 13 (85%)

summer TX ASAP participants who took the fall survey reported science was important in their daily life and they intended to discuss and master difficult science concepts by talking to their teachers or other students.

An examination of TAKS scores revealed a significant increase in average scale score for students who participated in

TX ASAP. The 11 students who participated in summer TX ASAP programs and took the TAKS science test in 2005 and 2006 improved their TAKS scores by an average of 100 points (Table 2). Non-TX ASAP

students increased their scores an average of 53 points from 2005 to 2006. However, only 1 of the 11 students who participated in a summer ASAP program improved from not passing in 2005 to passing in 2006.

Table 2. Lanier TAKS Science Comparison, 2005 to 2006

SUMMER 2005		
TX ASAP*	TAKS Year	Mean TAKS Science
No (N = 257)	2005	2069
	2006	2122
Yes (N = 11)	2005	1952
	2006	2052

Sources: District TAKS files and TX ASAP program participation records, August 2006

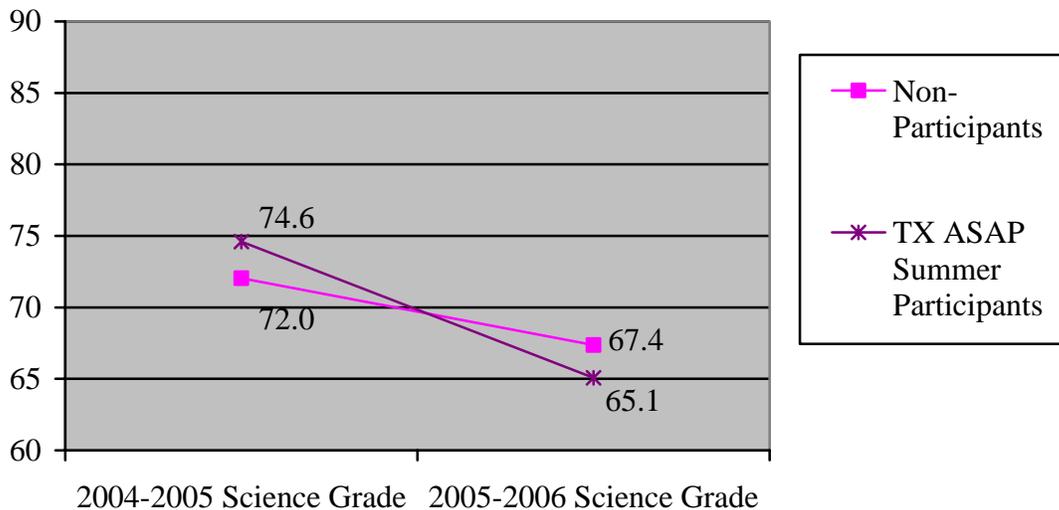
*Either “Summer Credit Repair” or “Science Circus” program

Note: Includes only students who took 2005 and 2006 TAKS science test

As shown in Figure 2, the average science grades of 65 Lanier TX ASAP summer participants decreased from 2004-

2005 to 2005-2006 by nearly 10 points. All non-TX ASAP participants’ grades decreased nearly 5 points on average.

Figure 2. Mean Science Grades by Year and TX ASAP Summer Participation



Sources: AISD course enrollment and grade files and TX ASAP participation records, August 2006

SUMMARY

A wide range of activities took place under the auspices of TX ASAP from Summer 2005 through Spring 2006 at Crockett, Lanier, and Reagan high schools. These three schools had large percentages of students who struggled on the TAKS science section and/or failed science courses. The TX ASAP activities at these schools included intensive after-school and summer school science instruction. The program originally was made available to students who were performing below their grade level and unsuccessfully in science courses and who received poor TAKS science scores. The program was later opened to all students, many of whom were already performing well on these criteria. Programs such as Crockett's SSI, Lanier's Summer

Science Circus, and credit recovery programs at all three schools sought to generate greater interest in science and to help students catch up with their peers in science achievement. Actual performance outcomes related to TX ASAP participation were hard to measure with confidence due to incomplete data, varying degrees of participation among students, and small sample sizes. Survey results, however, indicate that students maintained positive attitudes toward science.

RECOMMENDATIONS

Any future TX ASAP implementations should aim to improve data collection procedures so student performance measures can be assessed based on the degree of

participation in the program by each student. Furthermore, the program staff should seek a more aggressive recruitment strategy so the benefits of TX ASAP can be provided to students who greatly need assistance with the TAKS science test and their science

courses. To increase participation and generate greater interest in TX ASAP and science, other TX ASAP schools should follow Crockett's example of offering a wide array of enrichment activities and special events.

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