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ABSTRACT

This report presents an evaluation of Lockheed TEC, a pilot program established by the Lockheed Georgia Company as a joint summer employment venture with other Georgia institutions. The goal of this program for economically qualified high school juniors and seniors was to expose them to aerospace technology through four program objectives. These objectives include: (1) emphasizing the value of science, mathematics, and technological education through applications in the aerospace industry; (2) providing stimulating experiences that reward high achievement, and helping students in personal growth and career direction; (3) providing a means for participants to share their experiences through planned presentations at their home schools; and (4) establishing new linkages to support public education, parents, and others in the pursuit of excellence in mathematics, writing, and reading. Findings (which focus on students' program preferences, educational benefit of the program, and academic achievement) indicate that the program was a success. A list of nine recommendations based on the findings is included. Two of these recommendations are that Lockheed TEC should capitalize on its experiential aspect by incorporating and/or expanding on those activities that provide for learning by doing/knowledge applications and that future participants should have a 2.5 grade point average and show a proclivity for achievement in a technological area. (JN)

AN EVALUATION OF LOCKHEED TECHNOLOGY EMPHASIS CAMP (TEC) SUMMER 1984

RESEARCH, EVALUATION, AND DATA PROCESSING
ATLANTA PUBLIC SCHOOLS
ATLANTA, GEORGIA

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AN EVALUATION OF LOCKHEED TECHNOLOGY EMPHASIS CAMP (TEC) SUMMER 1984

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OVERVIEW

Lockheed Technology Emphasis Camp (Lockheed TEC) was developed as a pilot program focusing on the provision of unique learning opportunities for economically qualified high school juniors and seniors. Participating students were to have documented records of scholastic achievement as well as evidenced interest and abilities applicable for both white- and blue-collar careers in high technology.

Lockheed TEC was established by the Lockheed Georgia Company as a joint summer employment venture. Participating entities were Lockheed Georgia, the Private Industry Council of Atlanta (PIC), City of Atlanta Parks and Recreation Department, Morris Brown College, the Atlanta Public Schools, and the Marietta Public Schools. The program began on June 9, 1984, and culminated in an awards ceremony held the evening of August 14, 1984.

The goal of Lockheed TEC was to expose 40 high school juniors and seniors (30 from the Atlanta Public Schools and 10 from the Marietta Public Schools) to aerospace technology. This goal was obtained through four program objectives. These objectives sought the following:

1. To emphasize the value of science, mathematics, and technological education through applications in the aerospace industry.
2. To provide stimulating experiences that reward and inspire high achievement and help students in personal growth and career direction.
3. To provide a means for participants to share their experiences through planned visual presentations at their home schools.
4. To establish new linkages to support public education, parents, and others in the pursuit of excellence in mathematics, writing, and reading.

Support in achieving these objectives was provided by the five primary branches of Lockheed Georgia (Engineering, Manufacturing, Quality Assurance, Information Services, and Training/Human Resources), and better than 50 professional and technical employees.

Although the program involved students from both the Atlanta and Marietta public schools, the findings will focus on those participants from the Atlanta Public Schools only.

FINDINGS

Participants in Lockheed TEC were involved in two 12-day sessions. Session I began on June 19 and ended on July 12. The second session ran from July 16 to August 19.

Session I began with only 15 participants and was not at full strength (i.e., 20 participants until June 25, 1984). Late entry was due to processing difficulties encountered in recruiting/processing students not already employed for the summer who met the PIC eligibility and program requirements. Those three participants who were six days late in entering the program were recycled to Session II. Seventeen students, therefore, were involved in Session I only.

The second session began at full strength (20 participants). Due to the withdrawal of two Atlanta students following the discovery that they did not meet the PIC eligibility requirements, Session II had only 18 participants to complete the total 12-day program.

Table 1 provides a comparison of the preferences of Session I and II participants in respect to Lockheed TEC.

TABLE 1

STUDENTS' PROGRAM PREFERENCES

Program Aspects	Students' Preferences Session I (N=17)	Session II (N=18)
Engineering	15	17
CADAM	7	9
Flight Simulator	8	6
Manufacturing	—	2
Quality Assurance	2	—
Information Services	5	4
Training/Human Resources		
Graphics	7	8

As can be seen in Table 1, participants were permitted to give multiple responses in respect to their preferred program part. Though the Engineering section was most frequently cited as the most liked part of Lockheed TEC, it must be noted that all respondents indicated that they enjoyed those program areas most where they were able to participate.

Though all stated that they gained knowledge from their participation in Lockheed TEC and indicated they would like to be a part of the 1985 program, they differed in respect to whether they felt the Lockheed TEC experience would be of immediate academic benefit. (See Table 2.)

TABLE 2

EDUCATIONAL BENEFIT OF LOCKHEED TEC

Time Period	Session I (N=17)	Session II (N=18)
One Year or Less	11	13
More than One Year	6	5

As revealed in Table 2, all participants felt that Lockheed TEC was beneficial educationally. Thirty-five percent of the Session I and 33 percent of the Session II participants, however, felt that it will be more than a year before they would realize the educational benefits of their Lockheed TEC experience.

Three of the Session I and four of the Session II participants entered the program having already made specific career choices. The remainder of the Lockheed TEC participants indicated that participation in the program would assist them in selecting careers. In addition, the 14 Session I and 13 Session II participants who had not made career decisions indicated that Lockheed TEC had provided them with additional career options.

Of the 35 Atlanta Public Schools participants who completed the full Lockheed TEC Program, 20 are currently enrolled, and 15 were students who had graduated in June 1984. Table 3 shows the percentage of currently enrolled participants who met the Lockheed TEC academic requirements.

TABLE 3

STUDENTS DEMONSTRATING SCHOLASTIC ACHIEVEMENT
(N=20)

Academic Average	Technology Related Courses: Mathematics No.	Mathematics %	Science No.	Science %	Overall No.	Overall %
Less than C (2.0)	2	10	1	5	1	5
C to C+ (2.0 - 2.5)	5	25	4	20	3	15
B- to B (2.6 - 3.0)	3	15	9	45	6	30
More than B (3.1 - 4.0)	10	50	6	30	10	50
Total	20	100	20	100	20	100

As can be seen from Table 3, 80 percent of the currently enrolled participants had an overall academic average of 2.6 (B-) or better on a four-point scale. Further, 75 percent had better than a 2.6 average in science and 65 percent better than a 2.6 average in mathematics. It is clearly apparent that at least four of the participants did not meet the academic criteria for participation either by subjects (mathematics or science) or overall.

Talks with counselors in each of the seven high schools attended by the 20 currently enrolled students tended to indicate that those who were performing well are continuing to perform at a C+ or better level. They note, however, that several of those students who were performing below the C level have shown a new interest in their studies.

As part of the Lockheed TEC project, participants were to make presentations to their respective student bodies upon returning to school. In assisting the achievement of this objective, one set of the slides developed during the summer portion of Lockheed TEC and the applicable script were delivered to the principal of each of the seven Atlanta Public Schools high schools by a representative of Lockheed Georgia. Principals were encouraged to permit students to make their presentation to the student body prior to the Christmas break. Where possible, presentations were made to groups of students in each participating high school during the pre-Christmas period. The participants shared some insights and knowledges gained from their experiences in Lockheed TEC. In all instances, presentations were made to groups of no fewer than 30 students. Each presentation included a brief question-and-answer period.

Lockheed TEC, from its inception, forged additional linkages between private industry and the Atlanta Public Schools. As conceived, the program was designed to help students concretize the relationship between particular academic subjects and the employment world. Although this tie was limited during the pilot year, it is expected that it will become stronger and more resilient in subsequent program years.

CONCLUSIONS AND RECOMMENDATIONS

In spite of the initial difficulties in filling all slots, and transportation difficulties at the outset, Lockheed TEC was a success. Thirty-five students from the Atlanta Public Schools spent an enjoyable and profitable summer during which they gained additional knowledges and information upon which to make future academic as well as career choices. The overwhelming strength of Lockheed TEC was the experiential/knowledge application aspect of many of the presentations. This particular focus permitted students to interact with much of the equipment/apparatus utilized in the construction of an airplane, from the point of conception to rollout. When queried, all participants cited a Lockheed TEC presentation in which they were actively involved as their preferred program aspect.

Seventy percent of the Session I and 67 percent of the Session II participants believed they would realize the educational benefit of participating in Lockheed TEC within one year. The remaining percentages of participants felt it would take longer than a year to realize the benefits of the program. All participants recognized that they would benefit educationally from their Lockheed TEC participation but differed in when they believed that benefit would be realized.

Though not succinctly delineated as a participation requirement, objective 3 indirectly indicates that all participants should have at least one remaining year of high

school study. Only 20 of the Atlanta Public Schools participants were not already high school graduates. Sixteen of these 20 students met the scholastic requirement for participation. Clearly four participants did not meet the participation requirement in respect to scholarship, however, they have evidenced a new interest in school since participating in Lockheed TEC.

A limited connection between the home school, the program, the participants, and their parents was formed. One program strength was the linkage between the program and participants, and indirectly their parents forged by the relationships established by the Youth Motivators. These relationships went beyond program areas, yet added depth to the program itself. Missing, however, was a strong defined connection with the parents and home schools.

The following recommendations are based upon the conclusions cited in the preceding paragraphs.

1. In ensuing years, Lockheed TEC should capitalize on its experiential aspect by incorporating and/or expanding on those activities that provide for learning by doing/knowledge applications.

2. Academic benefits to Lockheed TEC participants can be concretized and/or embellished by assigning individual or team products/projects to be completed by a specified date utilizing information regarding the practical application of science, mathematics, and/or technological education in the aerospace industry.

3. Initiate preliminary recruitment process earlier to insure all participants have an overall academic average of 2.5 and show a proclivity for achievement in a technological area. A certain percentage of slots should be set aside for students with potential but an average of 2.0 to 2.49.

4. Insure that participant requirements are available and involve local school counselors/teachers in identifying/recommending probable participants.

5. Develop a stronger link with the home schools via the principal, magnet coordinator (if applicable), or junior/senior counselors. Counselors/principals/magnet coordinators could possibly provide the Project Coordinator with background data on participants so that certain program aspects may be tailored to address identifiable student weaknesses and/or the participants' academic focus.

6. Limit program participation to rising high school juniors and seniors in order to fully assess the programmatic impact both academically and vocationally.

7. Wherein there is more than one participant from a particular high school, make sure it is understood that either each student is to do an individual presentation or develop presentations so that they may be delivered by a group at the home school.

8. Establish a closer connection between Lockheed TEC and parents by the Project Coordinator issuing a periodic parent update throughout the summer concerning the program and student progress. Further, it is suggested that Motivators in all instances be urged to meet with parents at least twice during the program, preferably once near the beginning and prior to the culminating activity.

9. Maintain relationship with the Atlanta Public Schools Central Office in order to expedite the recruitment process, verify participant's academic and grade placement eligibility, and to insure a continuous external program evaluation.

Additional comments and recommendations regarding Lockheed TEC may be found in the internal evaluation prepared by the 1984 Program Coordinator.