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THE EFFECTIVENESS OF THE CONTRA COSTA COLLEGE ELECTRONICS PROGRAM IN PREPARING ITS GRADUATES FOR EMPLOYMENT AS REPORTED BY POST-GRADUATE STUDENTS.

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IN 1967, GRADUATES OF THE ELECTRONICS PROGRAM OF CONTRA COSTA COLLEGE WERE SENT A QUESTIONNAIRE ASKING HOW THEY RATED THE CURRICULUM AND WHAT THEY DID AFTER GRADUATION. THE 178 STUDENTS POLLED HAD GRADUATED AT ANY TIME DURING THE 14-YEAR LIFE OF THE PROGRAM. SEVENTY-EIGHT USABLE RESPONSES WERE RECEIVED, FROM WHICH THE FOLLOWING DATA WERE ABSTRACTED--(1) 23 GRADUATES DID NOT WORK IN ELECTRONICS, (2) 27 TOOK FURTHER WORK IN THE FIELD, (3) STARTING SALARIES, TITLES AND DUTIES VARIED WIDELY, AND (4) THERE WAS HIGH CORRELATION BETWEEN THE SUBJECTS TAUGHT AND ACTUAL JOB REQUIREMENTS. THE ONLY CHANGES IN THE COURSE THAT SEEMED INDICATED WERE ADDITIONAL EMPHASIS ON TRANSISTORS INSTEAD OF ON TUBES AND MORE TIME FOR BASIC THEORY AND TROUBLE SHOOTING. ONLY FOUR RESPONDENTS CONSIDERED THE PROGRAM A POOR ONE. OF THE 74 WHO RECALLED IT FAVORABLY, HALF WOULD RECOMMEND THE COURSE TO FRIENDS. A MORE COMPREHENSIVE STUDY, TO INCLUDE DROPOUTS AND TRANSFERS, IS RECOMMENDED. (HH)

CONTRA COSTA COLLEGE

RESEARCH & PLANNING

Selection Approaches to Vocational Education Students

(SAVES Project)

THE EFFECTIVENESS OF THE CONTRA COSTA COLLEGE ELECTRONICS PROGRAM IN PREPARING ITS GRADUATES FOR EMPLOYMENT AS REPORTED BY POST-GRADUATE STUDENTS

Investigator: Don Stephenson

January 15, 1968

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In the late spring of 1967 a survey of the graduates of the Contra Costa College electronics program was conducted in an effort to seek student evaluation of the level of skills necessary for entry into an electronics position and to determine how adequately these skills are taught in the electronics program, as indicated by student evaluation.

Those students contacted stretched over the 14 year history of the electronics program. Characteristically, the longer a student has been away from the institution the less likely he is to respond. One hundred seventy eight former students were polled and 87 returned the questionnaire. A response of 48 percent was received, which compares favorably with surveys of a similar design and nature. Nine of the replies were not usable for a variety of reasons, consequently the information in this paper is a reflection of the reports of 78 former students.

The following information and conclusions are based on the results of the survey:

1. 29% (23 respondents) have not worked in the electronics field.
2. 35% (27 respondents) took formal classes in electronics since leaving Contra Costa College electronics program.
   a. 17% (13) in the service.
   b. 1% (1) out of state college.
   c. 8% (6) state college or university.
   d. 4% (3) in other junior colleges.
   e. 5% (4) private or industry related schools.

3. It is difficult to adequately determine the average starting salary since changes in salary schedules have risen dramatically over the last few years. The usual starting salary (43% of the respondents) is between 400 and 500 dollars a month with three respondents reporting over $600 beginning salary. The type of job determines, to a large extent, the salary received.

4. Of those who responded to the question, "What was the title of your beginning position in the electronics field" 43% indicated they started as electronics technicians. The rest of the respondents were scattered across customer, engineer, repair and maintenance, electronics instructor, electricians, transmission, assembler, test technician, radio and TV repair, and sales. 17 of the 41 who described their duties indicated that their time was spent in maintenance and repair. An additional eight respondents indicated that they worked in technical fields related to electronics.

5. Twenty-three out of 73 respondents (32%) indicated that they had enrolled in college offering a bachelor's degree since leaving Contra Costa College. The school they are most likely to attend is San Francisco State College. A large variety of other colleges enrolled one or two of the former students with the bay area colleges picking up 75% of those who go on to degree colleges. An additional few students indicated that they went on to some industrial schools for advanced study. Only four of the twenty who indicated their collegiate major had left the field of electronics and majored in non-related fields.

6. As a result of being asked to rate how necessary certain skills and information was for their beginning job in electronics the former students placed the following emphasis: (on a scale of 1 through 5 with 1 representing vitally necessary, 3 representing moderately necessary, and 5 representing something not needed)

SKILLS & INFORMATION FOR ENTRY POSITIONS	AVERAGE SCORE	RANK
Knowledge of basic electronic theory and circuits	1.5	1
Trouble Shooting	1.62	2
Knowledge of basic electrical theory and circuits	1.65	3
Use and care of instruments	1.7	4
Knowledge and application of semiconductors (transistors, etc.)	2.0	5
Maintenance and repair of electronic equipment	2.1	6
Knowledge of tubes (gas diodes, triodes, and high vacuum)	2.4	7
Knowledge of electronic industry	2.9	8
Installation of electronic equipment	3.0	9
Manufacturing of electronic equipment	3.7	10

7. When asked to specify how adequately they thought the same information and skills were taught the former students indicated the following: (using a similar 1-5 scale)

SKILLS AND INFORMATION TAUGHT IN CLASS	TEACHING EMPHASIS		BEGINNING JOB	
	SCORE	RANK	SCORE	RANK
Knowledge of basic electronic theory and circuits	1.8	1	1.5	1
Trouble shooting	2.6	6	1.62	2
Knowledge of basic electrical theory and circuits	2.0	3	1.65	3
Use and care of instruments	2.3	4	1.7	4
Knowledge & application of semi-conductors, transistors, etc.	2.5	5	2.0	5
Maintenance and repair of electronic equipment	2.8	7	2.1	6
Knowledge of tubes (gas diodes, triodes and high vacuum)	1.9	2	2.4	7
Knowledge of electronic industry	3.0	8	2.9	8
Installation of electronic equipment	3.2	9	3.0	9
Manufacturing of electronic equipment	3.6	10	3.7	10

8. The following conclusions may be drawn from an analysis of the importance of the information and skills required on the beginning electronics job and an analysis of the reported classroom emphasis upon the same information and skills:

   a. There is a high degree of harmony between the order of importance of information and skills taught at Contra Costa College and the order of importance of information and skills needed on the beginning job.[1] (see footnote)

   b. The reported heavy classroom emphasis on knowledge of tubes appears out of harmony with the requirements of the entry job in the electronics field. It is possible that the rapid change-over to transistors in most electronics areas has a great deal to do with the apparent disparity.

      The problem is highlighted by the fact that the average score for classroom emphasis is 1.9 and the beginning job requirements score is 2.4. This means that the students see a real difference between the emphasis of tubes on the job and in the classroom. The role of transistors, though ranked fifth in importance in both the classroom and on the job, indicates that the rapid change-over to transistors is likely to be the cause of the problem since the teaching emphasis is 2.5 and the job requirement is 2.0 on a 5 point scale.

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(1) The rank order correlation coefficient comparing the classroom emphasis and information and skills needed for an entry job in electronics is .745. This correlation, which is a comparison of rankings of the scores for each of the 10 areas of investigation, is significant at the .04 level of confidence. This means that there are only four chances in one hundred that such a relationship could occur by chance.

c. It should also be noted that though the students indicated that trouble shooting was given more than moderate attention in class, the requirements of the job seems to place considerably more emphasis upon their ability to trouble-shoot.

Only a knowledge of basic electronic theory (which is fundamental to trouble shooting) appears to be more important than trouble shooting. It should also be stated that unless all of the other skills and information being examined are adequately learned it is unlikely that a person can be an effective trouble shooter.

d. It is recommended that the electronics department evaluate the reported over-emphasis on knowledge of tubes and the under-emphasis on trouble shooting.

9. When asked to evaluate the strong points of the program only 4 respondents indicated that they thought it is a poor program. All other responses were favorable in terms of good basic information, experience in the laboratory, and in theory taught.

50% of the respondents would send their best friend interested in electroncs to the Contra Costa College electronics program. A few (7) respondents would advise their friend to go into the United States Navy or into specialized electronics schools. A most interesting side light to this question is revealed in the fact that 19 of the 56 respondents (34%) who answered this question would refer him to a junior college electronics program. This would indicate that, though the students feel they have been adequately trained, a sizeable number (48%) feel the same train-

ing would be obtained in nearly any junior college.

The meaning of such replies are hard to evaluate since nearly one-half of the students did not specify Contra Costa College. However, it seems fair to conclude that they feel that the Contra Costa College electronics program served their needs since only 7 specified they would send their friends to a different junior college. In light of the information on the adequacy of classroom instruction in preparing students for their first full-time job in electronics it is difficult to understand why nearly half of the students did not specify that they would send their best friend to the Contra Costa College electronics program. Apparently the survey question was framed in such a way that nearly one-half of the respondents did not give clear answers.

10. Recommendations for further study.

a. A more comprehensive report, investigating all those who completed one or more semesters in the electronics program would provide a great deal of valuable information on how adequately the program meets the needs of <u>all</u> of its students. The present report deals only with those who successfully completed the program and ignores the fate of many others who enter the program and do not complete it. The following questions should be asked: (1) How do those who have the program before completion feel about the program?; Do they quit school or transfer to another curriculum?; Do they go to work - if so, do they work in electronics?; what are the reasons for leaving the program?; and, do those who do not continue possess special characteristics which may be used

to identify them before they enter and before they leave the program?

b. An in-depth examination of the nearly one-third who transfer from what is essentially a terminal program to four year schools may provide information relative to possible curricular changes for those who intend to transfer.