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LONG-TERM PERFORMANCE OF OLD DOMINION UNIVERSITY ENGINEERING TECHNOLOGY GRADUATES

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Abstract

The long-term career patterns of Old Dominion University's engineering technology baccalaureate graduates have been studied extensively. Results from approximately 400 alumni have been analyzed. The results of the analysis are presented and conclusions are drawn from the trends. The results indicate that the career progress of engineering technology graduates over a nearly twenty-year period is substantial and that they are performing effectively in a variety of career patterns.

Introduction

Old Dominion University (ODU) in Norfolk, Virginia awarded its first Bachelor of Science degrees in Engineering Technology in 1973, and accreditation by the Engineers Council for Professional Development (ECPD) was received in 1976. Accreditation was later transferred to the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC-ABET) following reorganization of the accrediting agency. The programs in Civil Engineering Technology (CET), Electrical Engineering Technology (EET), and Mechanical Engineering Technology (MET) have maintained continuous accreditation since 1976.

In preparation for an ABET visit in the fall of 1993, the department recently undertook an extensive study of the career patterns, occupational progress, and professional development of its graduates over the period since the first degrees were awarded. The survey form used for collecting data is provided in Appendix A of this report. The graduate had the option of remaining anonymous or of providing his or her name.

The forms were mailed to over one-thousand alumni for whom addresses were available encompassing the entire period from 1973 through 1992. Approximately 400 alumni forms were received by the department, and about 98% of the alumni chose to identify themselves. By scanning through the names of the alumni, there seemed to be just as many former "below-average" students as "above-average" students. We, therefore, believe that the returns represent a reasonable cross-section of the alumni population. With the exception of a few years for a few programs, which will be delineated in the analysis that follows, the number of returns per class was typically 15 or more. Thus, this constitutes a population sample sufficiently large to draw some general conclusions.

In the sections that follow, a number of general patterns established from the data will be studied. The order is not necessarily the same as on the forms, and in some cases, the data may represent a slightly different format than given in the forms. The pertinent question on the form will be repeated at the top of the each table.

In some of the studies, graduates are categorized according to the number of years since graduation, rounded to the nearest integer number of years. At the time of the survey, the largest integer number was 19 years, so the independent variable in those cases varies from 1 to 19.



During the period in which this study was being performed, an excellent paper by Mott [1] appeared, which indicated results of a similar study undertaken at the University of Dayton, Mott indicated the need for other studies to provide additional data of the type obtained. Our studies overlap and support many of Mott's findings, but they provide some information from a different perspective, We, therefore, offer this study as an additional contribution to support and complement Mott's study of the long-range performance of engineering technology graduates.

Salary Study

Based on the salary as of January 1, 1993, the mean values were computed for the three programs as a function of the number of years since graduation. Based on current dollars, it appears that EET and MET graduates tend to reach a level of approximately \$50,000 after about 11 years, but CET graduates are somewhat behind. Beyond that point, the fluctuation in salaries increases, partly as a result of fewer data points, but also as a result of changes in career directions, i.e., management versus continued technical or engineering work.

As a basis for comparison, a decision was made to compare ODU engineering technology salaries with Engineering Manpower Commission (EMC) data [2]. The latter data are based on national statistics concerning the salary progress of engineers throughout the country and are released periodically. The most recent data available were from mid- 1992, but they should be sufficiently close to the time period of this study to permit a valid comparison.

Annual Salary vs Years Since Graduation ODU ET Compared to EMC Engineering Data

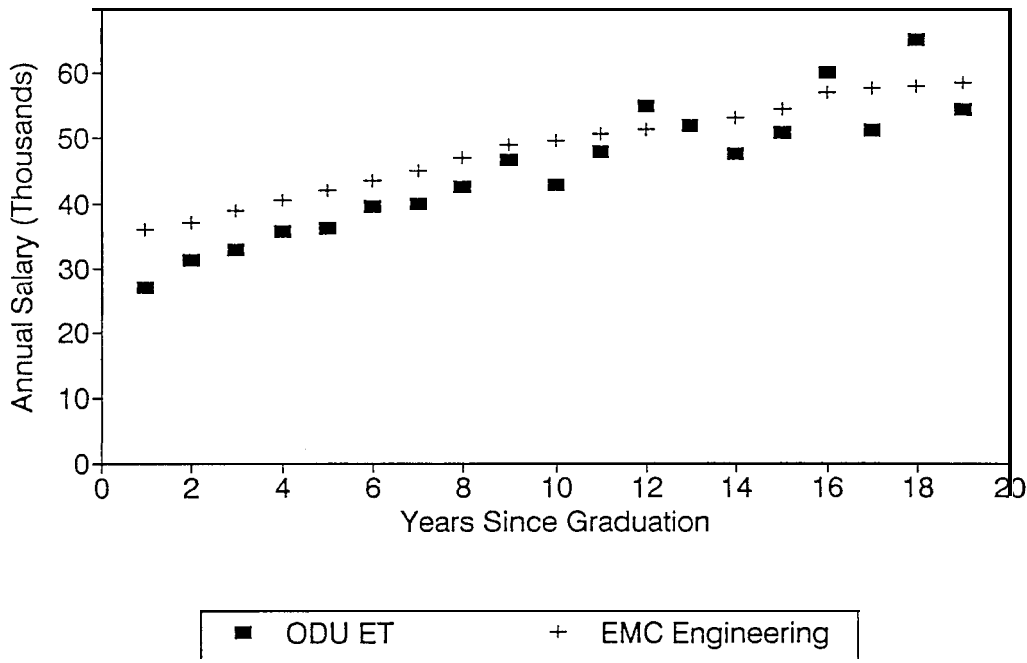


Figure 1

The EMC data are based on median salaries, while data shown in Figure 1 are based on mean salaries. Consequently, the ODU data were reorganized to determine median values for comparison purposes. In addition, the salaries for all three programs were combined for this purpose.

The ODU engineering technology salaries and the EMC salaries are compared on a year-by-year basis in Figure 1. As most national studies show, engineering technology graduates tend to start at lower salaries than their engineering colleagues, and this effect is definitely evident. One qualifier here is that most ODU ET graduates tend to stay in the Southeast where salaries are generally lower, while the EMC data reflect values from many higher salaried areas, e.g. California.

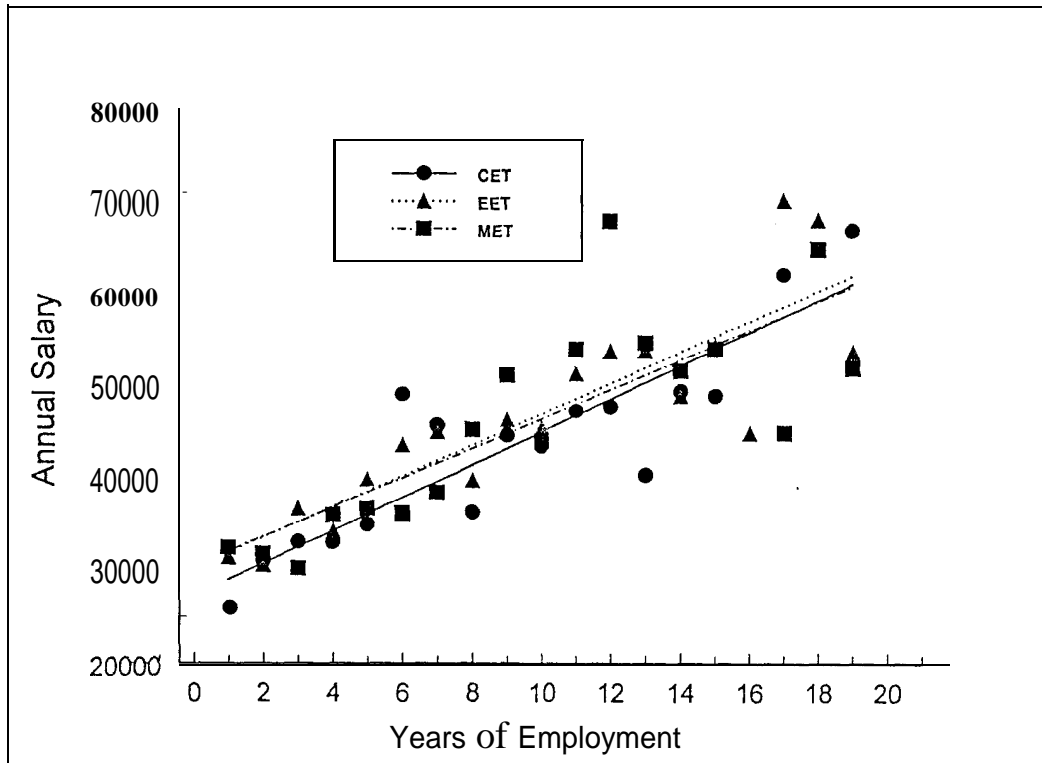


Figure-2

As the number of years increases, the ODU salary data tends to track the EMC data with about the same differential until about year 11 or so. At that point the curves cross and show several crossings over the next several years. Said differently, an ODU ET graduate appears just as likely to earn more as to earn less than the median national engineering salary level after about 11 years. Figure-2 shows the salary progression for each of the three programs.

Licenses or Certifications

Alumni were asked to list various licenses or certifications that they have obtained. Based on the approximately 400 respondents, the number of persons in each of the several categories is listed in Table 1. It should be pointed out that in the Commonwealth of Virginia, and in some other states, graduates of ET programs must practice engineering for 6 years prior to taking the professional engineering examination. Consequently, the 33 persons who have become professional engineers are based on a population of about 300, which represents the pertinent 13-year period for which alumni would be eligible.



Observe that 113 persons in the group have passed the EIT examination (now called the Fundamentals of Engineering or FE examination), In the authors' collective opinions, this is a significant number based on the widespread perception that engineering technology programs are not suited for EIT preparation. One of the motivating factors for ODU graduates is that many of the local employers are either Civil Service agencies or work directly with Civil Service agencies, and passing the EIT/FE examination is a means of establishing "legitimacy" with some of these organizations. Interestingly, it appears that EET graduates, as compared with CET and MET graduates, are much less motivated to take the final step to become registered professional engineers.

TABLE 1.

LICENSES OR CERTIFICATIONS

(Indicate any special licenses or certifications that you have received.)

PROGRAM	EIT	PE	CMfgE	LSIT	LS	NICET	OTHER
CET	34	20			1	3	RCE
EET	44	3				1	*
MET	35	10	2				**

* One each of following: ASQC, CQA, Electricians License, Master Electrician, RCDD

** One each of following: CMfgT, NEBB, CPE

**License or Certifications
Percentage Of Respondents**

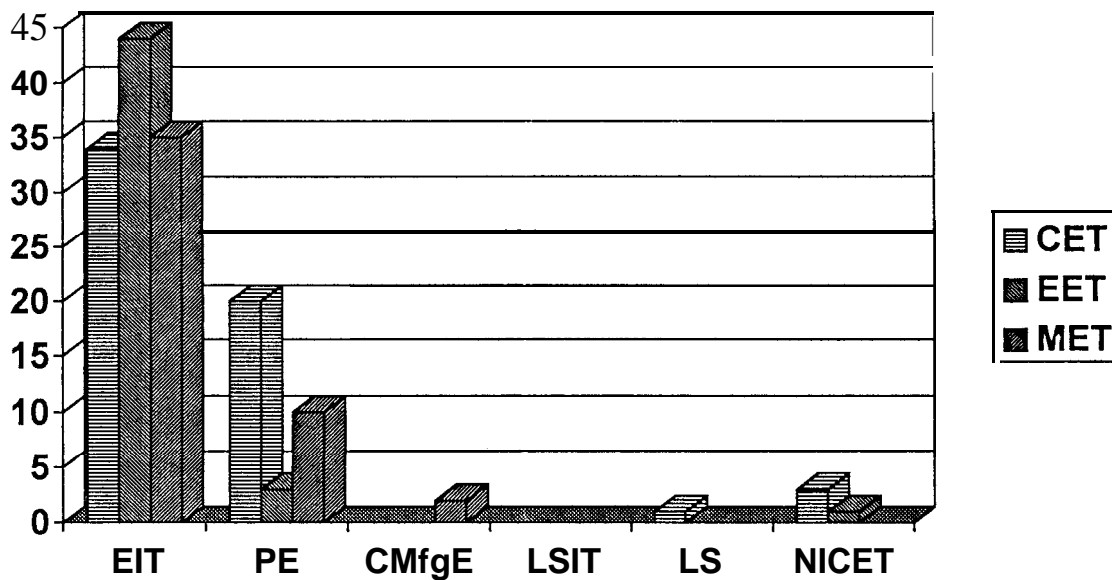


Figure-3

Additional Degrees after ODU

The number of alumni who have received additional degrees and the corresponding fields are shown in Table 2. Obviously, the MBA has been the most popular advanced degree. It should be noted that the Masters of Engineering Management degree is offered at ODU, and our graduates have established credibility in that program.

One or more graduates of each of the ET programs have been successful in engineering master's degree programs as is partially evident from the table. In all fairness to MET, we know at least one who has completed a master's degree in Mechanical Engineering, but he evidently did not participate in the survey. In all cases in which we are aware, the ET graduates were not required to first complete an undergraduate degree in the engineering discipline. Instead, they typically were required to complete about five "undergraduate" leveling courses, which usually included several advanced mathematics classes.

TABLE 2.

ADDITIONAL DEGREES AFTER ODU

(List any additional degrees that you have received.)

PROGRAM	MBA	M Engr Mgmt	Masters CE	Masters Envir Engr	MS EE	MS Comp Engr.	MS Comp Sci	JD	Other BS	Master Theology	PhD
CET	4	1	1						1		
EET	9	1		1	2	1	4	2			1
MET	7	3	1						3	1	

Career Progress

Alumni were asked to compare their career progress with other persons in similar professional or technical positions, and the results are shown in Table 3. In all three programs, the perceived progress for about 50% was about the same as for persons whose degrees were from other schools or programs, but for between 30 and 40%, the perceived progress was either somewhat higher or much higher. On the down side, a much smaller percentage perceived their career progress as somewhat less or much less. For some reason, MET had a higher percentage in this category.

TABLE 3.

CAREER PROGRESS

(This analysis is quite subjective and requires your best opinion. By comparing your progress with other persons in similar professional or technical positions, but whose degrees were not from ET programs at ODU, indicate your perceived progress in terms of advancement, increased responsibilities, raises, etc.)

Program	much less	somewhat less	about the same	somewhat higher	much higher
CET	3.12%	4.69%	54.69%	31.25%	6.25%
EET	3.82%	6.37%	49.04%	35.67%	5.10%
MET	3.67%	10.09%	53.21%	29.36%	3.67%

Graduate Satisfaction

Alumni were asked to indicate their relative level of employment satisfaction, and the results are shown in Table 4. The averages for the three group are displayed graphically in Figure 4. It is very enlightening to note that between 80 and 90% of the graduates are moderately or very satisfied with their careers. Interestingly, the CET group had no one indicate “very dissatisfied” even though their average salary levels are the lowest. Perhaps as a byproduct of the Career Progress response, METs had the highest level of dissatisfaction.

TABLE 4.

EMPLOYMENT SATISFACTION STUDY

(Considering your overall career pattern since graduation, especially in regard to your work assignments, indicate your relative level of employment satisfaction.)

Program	very dissatisfied	moderately dissatisfied	neutral	moderately satisfied	very satisfied
CET	0%	3.12%	6.25%	50.00%	40.63%
EET	2.53%	6.96%	8.86%	37.97%	43.67%
MET	5.56%	7.41%	8.33%	50.00%	28.70%

Employment Satisfaction Study

Percentage of Respondents

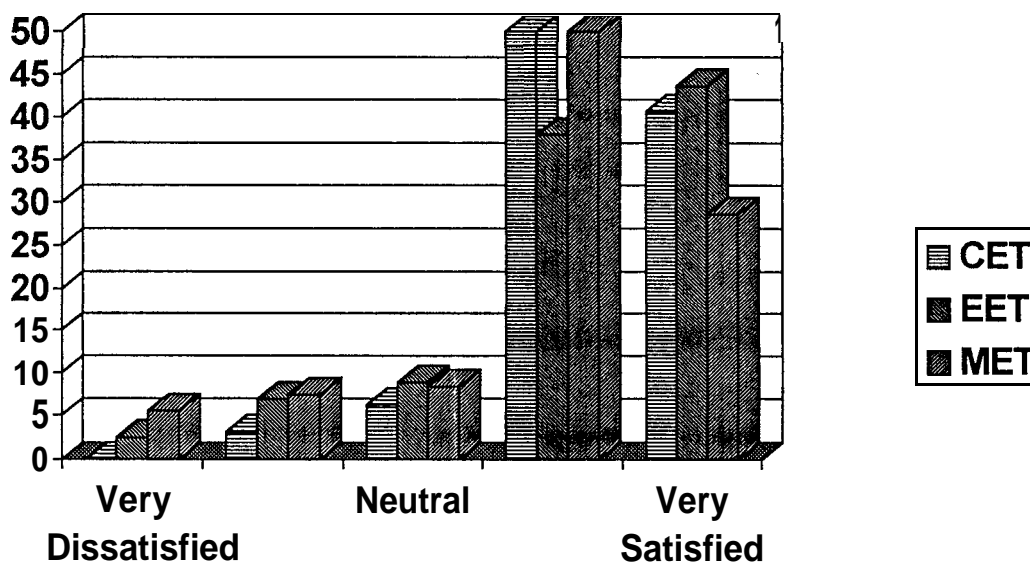


Figure-4

Career Direction Study

Alumni were asked to categorize their present position in one of four broad categories as displayed in Table 5. There is amazing consistency among the three programs. Approximately 60% or so of all graduates are performing engineering or technical work in the same field as the degree, while about 15% are performing engineering or technical work in a different field than the degree. Finally, about 20% of the graduates are now in management positions.

TABLE 5.

CAREER DIRECTION STUDY

(Indicate which of the following categories best fits your present position.)

PROGRAM	Engr./Technical Work in Same Field as Degree	Engr./Technical Work in Different Field than Degree	Management	Other
CET	67.1%	15.8%	17.1%	
EET	60.8%	15.8%	21.5%	1.9%
MET	57.5%	13.3%	22.1%	17.1%

The percentages above are based on the major groups.

Conclusions

Although there are many detailed conclusions that can be drawn from individual data, the overall pattern leads to the following general conclusions concerning Old Dominion University baccalaureate engineering technology graduates:

1. Alumni are pursuing successful career patterns with salary and professional growth commensurate with others of similar educational and professional background.
2. Alumni are employed in positions commensurate with their educational background, and most are still functioning in their fields of study.
3. The vast majority of alumni are satisfied with their career progress and their professional work activities.

REFERENCES

1. Mott, Robert L. "Twenty-five Years of Success with the Baccalaureate Degree in Engineering Technology". Journal of Engineering Technology, Vol. 9 Washington, D. C.: The American Society for Engineering Education, 1992.
2. Engineering Manpower Commission. "Engineering Salaries, 1992". Engineering Manpower Bulletin, No. 120 Washington, D. C.: Engineering Manpower Commission, 1992.

WILLIAM D. STANLEY

William D. Stanley is the chairman of the **Engineering Technology Department at ODU**. He received his Ph.D. in Electrical Engineering from N.C. State in 1963. He has authored more than half dozen books. Professor Stanley has received nine outstanding faculty awards and is a member of IEEE and ASEE.

ALOK K. VERMA

Alok K. Verma is the Program Director of the MET Program and Director, Automated Manufacturing Laboratory at ODU. He received his B.S. in Aeronautical Engineering from Indian Institute of Technology in 1978 and MSME from Old Dominion University in 1981. He is active in ASME, ASEE and SME.

Appendix A

**OLD DOMINION UNIVERSITY
DEPARTMENT OF ENGINEERING TECHNOLOGY
ALUMNI EMPLOYMENT SURVEY FORM**

OPTIONAL

In order to encourage as much participation is possible, we are making this section optional. However, we assure you that all information will be kept confidential within the departmental administrative files, and it will not be released to any outside organization.

NAME: _____
(last) (first) (middle initial)

ADDRESS: _____

TELEPHONE: HOME () _____ WORK () _____

EMPLOYER: _____

Circle your program. CET EET MET TO

Circle the integer representing the nearest value of the number of years since graduation as of January 1, 1993.

1 2 3 4 5 6 7 8 9 1 0 1 1 1 2 1 3 1 4 1 5 1 6 1 7 1 8 1 9 2 0 .

1. ENTRY-LEVEL EMPLOYMENT INFORMATION

To the best of your memory, indicate your annual starting salary and job title following graduation.

SALARY _____ TITLE _____

2. PRESENT EMPLOYMENT INFORMATION

As of January 1, 1993, indicate your annual salary and job title .

SALARY _____ TITLE _____

3. LICENSES OR CERTIFICATIONS

Indicate any special licenses or certifications that you have received.

E I T _ PE_ C M f g E LS I T _ LS_ N I C E T Other _____
(Name)

4. ADDITIONAL STUDIES

List any additional formal studies you have undertaken, the institutions involved, and whether undergraduate (UG) or graduate (G).

_____ UG__ G __
_____ UG__ G __

5. ADDITIONAL DEGREES

List any additional degrees that you have received.

Level _____ Field _____ Institution _____
Level _____ Field _____ Institution _____

6. **ORGANIZATION MEMBERSHIP**

List any technical or professional organizations of which you are a member. _____

7. **CAREER PROGRESS**

This analysis is quite subjective and requires your best opinion. By comparing your progress with other persons in similar professional or technical positions, but whose degrees were not from ET programs at ODU, indicate your perceived progress in terms of advancement, increased responsibilities, raises, etc.

much less somewhat less about the same somewhat higher much higher

8. **GRADUATE SATISFACTION STUDY**

Considering your overall career pattern since graduation, especially in regard to your work assignments, indicate your relative level of employment satisfaction.

very dissatisfied__ moderately dissatisfied__ neutral__ moderately satisfied_ very satisfied_

9. **CAREER DIRECTION STUDY**

Indicate which one of the following categories best fits your present position.

Primarily engineering/technical work in same field as degree _____
Primarily engineering/technical work in different field than degree _____ Primarily management _____
(Indicate field _____)
Other (Please describe. _____)

10. **TECHNICAL COURSE RELEVANCY**

Indicate several technology, math, or engineering subjects that you have found most helpful in your career (e.g. microprocessors, surveying, thermodynamics, calculus, etc.)

11. **NON-TECHNICAL COURSE RELEVANCY**

Indicate several non-technical or non-mathematical subjects that you have found most helpful in your career (e.g. public speaking, technical writing, philosophy, etc.)

12. **ADDITIONAL COURSE(S)**

List any course(s) that were not required, but that you believe would have been very helpful to you in your career.

13. **EMPLOYER SATISFACTION STUDY**

Enclosed with this form are a separate form and envelope for use by your immediate supervisor or other official who can evaluate your recent employment record. As with this form, you can choose to place your name on the form or let him or her evaluate you without disclosing your name to us. Indicate by a check mark if you have supplied the form and envelope to that person. _____

14. **COMMENTS**

Indicate below any comments you can provide to us about your education at ODU and the extent to which it prepared (or didn't prepare) you for your career.

