A Summary of Periodic Surveys of WSU Engineering Technology Graduates

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SUMMARY

In 1973, Wayne State University founded the Division of Engineering Technology in the College of Engineering to offer upper division (Junior and Senior years) programs leading to a baccalaureate degree in engineering technology. These programs were developed at the request of industries in southeast Michigan to serve the further education needs of community college technical associate degree graduates already employed in technical areas. The first ever survey of the Wayne State University (WSU) Engineering Technology (ET) graduates was conducted in 1988.

In order to continue to learn about our alumni, their employers, their professional progress, etc., it was decided to conduct periodic surveys every five years. This paper summarizes results of two such surveys as well as provides some insight about changing trends in the employment in southeast Michigan.

Specifically, the following information is covered and discussed: changing trends in employers, job titles, average salary by the year of graduation, job responsibilities, career mobility opportunities, graduates' assessment of their education, graduate degrees and graduate studies, and most valuable and least valuable courses. In conclusion, impact of the graduates' input and changes we have implemented in our curricula are also addressed.

INTRODUCTION

Located in the heart of Detroit's cultural center, Wayne State University (WSU), a Carnegie Research I institution, has long history of strong relationships with community, business, and industry. It is the state's third largest university, organized into 14 colleges and schools, enrolls more than 30,000 students of which 35% are minority.

On May 11, 1973, based on a very strong support by industry in southeast Michigan, the WSU Board of Governors approved the establishment of Division of Engineering Technology in the College of Engineering. That action was taken to serve technical workforce needs of industry by offering upper division (junior and senior years) programs leading to a baccalaureate degree for community college technical associate degree graduates. A vast majority of those graduates were and continue to be gainfully employed.

In June 1974, the Division awarded its first Bachelor of Engineering Technology (BET) degree. Based on alumni and industry inputs, subsequently, the degree title was changed to Bachelor of Science in Engineering Technology (BSET) degree effective fall 1988. In winter 1993, the Division launched a Master of Science in Engineering Technology (MSET) degree, again at the request of alumni and industry. The MSET degree was and is among a handful of such programs in the country.

Employers, students, parents, and funding agencies, all want assurance that educational institutions are providing quality education [1]. One of the important ways to satisfy that need is to conduct a survey of alumni. Assessment is most effective when it is ongoing [2]. The first ever official survey of the WSU ET graduates was conducted in 1988. Since then, it has been our goal to perform such studies with our alumni on a periodic basis, generally every five years. Another survey was carried out in 1993.

ALUMNI SURVEY

Survey instrument was designed as only two pages long. A cover letter explaining the importance of alumni input and possible impact on the programs at WSU was included with the form. The second survey also included the results of previous survey. We also solicited names of our

alumni's supervisors to learn about supervisors' perceptions of WSU and their views of the engineering technology profession. More than 60% of the alumni indicated not to contact their supervisors. By the year 1992, we had more than 1000 alumni and about 90% of the respondents to our surveys indicated that they continued to work and live in Michigan.

Table 1 shows that about 10% of the alumni completed the survey instruments. It also shows the per cent distributions of the curricula they studied at WSU. Some respondents in the survey instruments checked part-time as well as full-time student status [3,4]. That is the reason, Table 1 shows a combined total of part-time and full-time students exceeding 100%.

Table 2 shows the names of the top 6 employers and the per cent of alumni who reported working for a particular organization. One significant change that has occurred in the five years is that there has been a decline in a number of alumni working for the big three automobile manufacturers. Also, over the same period, more than 30% increase in a number of companies employing our graduates. This is sign of changing times where more and more supplier companies are evolving in the market place to support large manufacturers.

Table 3 contains job titles reported in the two surveys. There is a definite increase in management level titles which can be explained by the fact that our alumni are climbing the professional ladder over a period of time.

Table 4 shows job responsibilities in the areas of design, troubleshooting, product testing, manufacturing, R&D, quality control, consulting, field service, purchasing, sales and marketing. Here the respondents were requested to check multiple areas and as a result, the total exceeds 100%. Table 5 indicates average salary by the year of graduation as reported in the 1993 survey. The averages for the seventies included small samples and as a result those numbers may not be significant.

In response to our question, "Has the BET/BSET degree given you career mobility opportunity?" more than 80% responded with a positive answer. More than 80% also indicated that the education had enabled them to obtain the type of job they had thought it would. A more surprising finding was the fact that a number of them had gone to graduate school contrary to the general belief. This information is provided in Table 6.

Table 7 summarizes the most valuable and least valuable courses. Speech and writing courses received the highest marks as the most valuable, followed by General Physics and Reliability & Engineering Statistics. Social Science/Humanities courses were identified as the least valuable.

IMPACT OF SURVEYS

In the era of continuous quality improvements, it is very important for educational institutions obtain input from its graduates. This helps us understand how well we are serving industry needs as well as our own relevance, particularly in a professional program. An alumni survey is one of the significant instruments we have to sustain our survival. Some of the changes we have implemented in our programs include, programming language requirement, initiation of MSET degree, topical changes in courses, and revisions in lab experiments. Also, we have used the published results of the alumni survey to help our alumni in their professional positions and in educating industry personnel. At the same time, it has made us feel good about our role in helping support the industrial infrastructure.

CONCLUSIONS/RECOMMENDATIONS

Alumni provide very valuable information that can be used in many ways. Survey results provide a powerful tool for our survival. In summary, the alumni surveys we have conducted have served us, the educational institution very well. It has help build our image and misspell some myths.

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Table 1. Respondents

	1993	1988
Number of survey forms sent	903	742
Responses received	12%	13%
Electrical/Electronic ET	50%	42%
Manufacturing/Industrial ET	22%	26%
Mechanical ET	28%	32%
Attended full-time	35%	35%
Attended part-time	72%	71%

Table 2. Employers

	1993	1988
GM	15%	22%
Ford	15%	15%
Chrysler	8%	9%
Detroit Edison	4%	6%
General Dynamics	4%	4%
TRW		3%
Army TACOM	4%	
Number of other employers	42	30

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Table 3. Job Titles

	1993	1988
Manager	15%	8%
Design Engineer	9%	10%
Senior Engineer	9%	13%
Supervisor	7%	7%
Project Engineer	4%	10%
Product Engineer	4%	6%
President/Owner	4%	
Director	3%	
Field Engineer	3%	
Manufacturing Engineer	3%	6%
Quality Engineer		5%
Asst/Assoc Engineer		4%

Development Engineer   Draftsperson
DVA Engineer   Electrician
Engineering Specialist   Engineer
Experimental Specialist   Field Engineer
Industrial Engineer   Liaison Engineer
Mechanical Engineer   Professor
Mfg Planning Specialist   Proposal Engineer
Release Engineer   Reliability Specialist
Sr Product Planner   Senior Buyer
Tech Service Engineer   Staff Engineer
Test Engg Technician   Systems Engineer
Technical Support

Table 4. Job Responsibilities

Design 39%	Troubleshooting 35%
Product Testing 30%	Manufacturing 25%
R & D 19%	Quality Control 12%
Consulting 11%	Field Rep 11%
Purchasing 8%	Sales/Marketing 8%
Other 21%	

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Table 5. Average Salary by Year of Graduation

Year	Salary	Year	Salary
1992	$45,900	1984	$49,400
1991	$45,300	1983	$58,200
1990	$42,800	1982	$55,700
1989	$50,700	1981	$57,200
1988	$48,600	1980	$56,700
1987	$46,400	1979	$74,000
1986	$55,700	1978	$58,000
1985	$51,200	1977	$74,700

Table 6. Impact of Education

Has the BET/BSET degree given career mobility opportunities?	1993	1988
A great deal	46%	58%
Somewhat	38%	28%
A minimal amount	13%	9%
None	1%	1%
No basis for judgement	2%	4%
Did your education enable you to obtain type of job you had thought it would?	1993	1988
Yes	81%	82%
No	15%	8%
No basis for judgement	4%	6%
Have you continued your education since graduating from WSU?	1993	1988
No	46%	57%
Yes	51%	43%
Those who have completed degrees	10%	9%
Degrees earned: JD, MBA, MSA, MSEE, MSIE, MS Computer Engineering, MS Engineering Management, PhD.		

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Table 7. Most and Least Valuable Courses

Indicate courses you found most valuable and least valuable	Most	Least
Speech/Writing Courses	90%	1%
General Physics	84%	5%
Reliability & Engg Statistics	71%	14%
Engineering Graphics	66%	13%
Engineering Economic Analysis	66%	19%
Technical Courses	64%	1%
Engineering Materials	63%	13%
Computer Programming	50%	37%
Appl Calc & Diff Equations	36%	50%
General Chemistry	35%	48%
Applied Diff & Integral Calc	34%	48%
Social Science/Humanities	26%	51%

BIOGRAPHY OF AUTHOR

Mulchand S. Rathod: Mulchand S. Rathod, Ph.D., P.E. joined WSU as Professor and Director of the Division of Engineering Technology in 1987. He earned his B.E. (Mechanical) degree from Sardar Patel University in 1970; and his M.S. in 1972, Ph.D. in 1975, both in Mechanical Engineering from Mississippi State University. At WSU, he has been instrumental in starting three new undergraduate and a graduate program. He established student chapters of SME and Tau Alpha Pi and is the founding leader of the Professional Order of Engineering Technology.

His prior appointments include State University of New York at Binghamton, Tuskegee University, Jet Propulsion Laboratory, and IBM. A registered Professional Engineer, he is active in ASME, SME, ASHRAE, and ASEE. He has served as a Commissioner on the TAC of ABET. A holder of numerous publications and inventions, he is listed in several Who's Who publications. He was awarded the 1995 Dedicated Service Award by ASME and Certificates of Recognition by NASA and IBM for technical innovation. Also, a recipient of numerous grants and contracts and a Fellow of ASME, Dr. Rathod is a nationally known leader in Engineering Technology education.