

Course Analysis Effectiveness Survey of BSET Graduates

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ABSTRACT

Just as the business world has realized that customers are its first priority, higher education also needs to become customer oriented. Since our customers are our students, the opinions by recent and past graduates on course effectiveness with respect to their job functions is important.

This analysis was part of an overall strategic planning effort within the Engineering Technology department of NJIT. A ten-year follow-up study of EET graduates was completed.

This study concerned itself with current and past job functions, salary analysis, job progression, prior (to graduating) work experience and course analysis. This paper will concentrate on the course analysis.

SURVEY DEMOGRAPHICS

A survey was sent out to over 450 graduates of the electrical engineering technology program at NJIT, representing graduates from this program over a ten year period. The 60 graduates responding represented a 13% response rate. While names and other demographic information were optional, over 80% of the respondents included that information. This will help with further follow-up studies.

Over 85% of the respondents worked two or more years before graduation, typically in a related technological field. Over 95% of those replying agreed or strongly agreed that the BSET has helped their career.

With respect to job title, over one-third of the students worked in technical areas (research, design, engineering and development). Almost one-half of the students responding had job positions **immediately after** graduating with the title engineer.

There was a great diversity in the types of jobs first performed after graduation (See Table I). This could have a significant impact in the response to the questions on the impact of courses in their first position.

| TYPE OF JOB | # OF STUDENTS | % OF TOTAL |
|------------------------|---------------|------------|
| Design and Development | 8 | 13 |
| Production/QA | 9 | 15 |
| Repair/Service | 17 | 28 |
| Research | 10 | 17 |
| Sales | 3 | 5 |
| Management | 2 | 3 |
| Programming | 2 | 3 |
| Other | 9 | 15 |

Table 1. Breakdown of Types of Jobs immediately after graduation

TECHNICAL COURSE ANALYSIS

There were two questions in the survey that dealt with technical courses that the students perceived were most helpful and least helpful to them in their first position after graduating. Many of the courses that were taken might have some impact later in a graduate's career. However, it is important to understand the relevance of these courses immediately after graduation.

There were numerous courses listed as most helpful in the first position after graduation. Students were able to list up to three courses, although some students would list complete categories (i.e. computer courses or labs). The three courses or course areas, which had the highest response rate, were general introductory electrical courses (21%), control and communication courses (20%), and technical writing (8%).

There was no correlation between the types of courses considered helpful and either the field or job title for the first job after graduation. Part of this problem is that in looking at Table I, EET graduates initially are in very diverse fields, ranging from repair to research. Because of this lack of homogeneity in work assignments, different courses will impact an EET graduate's first job. Even the 10% of students that were in non-technical job functions (sales, management or business) felt that the electrical technical courses were most helpful.

In regard to courses that were considered least helpful, there was definitely a strong direction to the non-electrical engineering technology courses. Thermodynamics was one course singled out by over 16% of the students as least helpful. However, 6 out of those 10 responses came from students that were in a repair job function immediately after graduation. Two of the 10 respondents with job titles of research also felt that thermodynamics was their least helpful course.

Over 35% of the respondents did not list **any** technical course as their least helpful. In addition, 16% felt that the mathematics courses were least helpful. These were students in the repair and production area.

NON-TECHNICAL COURSE ANALYSIS

The non-technical courses that were most helpful in the student's first job centered on management courses, technical writing and industrial cost analysis. Thirty-five percent listed the management course (which is a Principles of Management course) as one of their most useful courses. Fifty percent of the respondents that listed the management course were in research or repair as their first job function, which could indicate a future direction for these individuals.

Forty-five percent of the respondents listed Technical writing and/or English as useful in their first job function. In that group, seven of the 10 students who were in a research capacity responded with technical writing.

Fifteen percent of the respondents listed an industrial cost analysis course as one of the useful courses in the non-technical area, even though it is listed in the curriculum as a technical course. Of those respondents, 80% were in either the research or repair field as their first job position.

In analyzing non-technical courses that were least useful in the graduate's first position after graduation, forty percent of the respondents did not list course. Of the remaining students, one-third chose history.

CURRENT POSITION COURSES/SKILLS

Students were also surveyed as to what courses or skills would help them in their current position (see Table 2 for details on their current position). Almost 25% surveyed were interested in "soft skill" courses. These courses include management, planning, goal setting, financial and project management. Over half of these students also were either interested or in the process of obtaining a graduate degree, principally in management. Almost 75% of the respondents to this question were currently in either management or sales positions.

Additional computer and digital courses, beyond the required courses, were listed by 35% of the respondents as desirable. Most of the comments were generalized, although several specific responses include networking, databases, C programming and JAVA. Similar to the responses on the soft skills, the respondents had varied positions, ranging from management, research, production and support.

| TYPE OF JOB | # OF STUDENTS | % OF TOTAL |
|------------------------|----------------------|-------------------|
| Design and Development | 15 | 25 |
| Production/QA | 9 | 15 |
| Repair/Service | 6 | 10 |
| Research | 6 | 10 |
| Sales | 4 | 7 |
| Management | 12 | 20 |
| Programming | 4 | 7 |
| Other | 4 | 7 |

Table 2. Breakdowns of Types of Jobs Graduates currently have

CONCLUSION

Due to a large diversity in job types after graduating, it can be very difficult to assess which courses will be most relevant in their first job. While the response rate to this survey was only 13%, there are certain trends that are worthwhile exploring for future curriculum changes.

One of these changes is an expansion in offering “soft skills” courses, such as management, planning, goal setting, financial and project management. This interest comes from respondent’s needs in both their first job after graduating as well as in their current positions. This interest in these types of courses can be related to the types of jobs that EET graduates currently hold- over 25% of the respondents are in either management or sales, and another 25% are in design and development.

Engineering Technology Graduate Follow-up Survey

Name (Optional) _____

Address _____

City _____ State _____ Zip _____

Phone _____

The year that I graduated NJIT was _____

1. My undergraduate option was :

- Construction and Contracting Electrical Manufacturing Mechanical
 Surveying

1. The number of years that I worked **before** I graduated was:

- 0 1 2-5 greater than 5

3. The number of years that I worked **in my field before** I graduated was:

- 0 1 2-5 greater than 5

4. When I **first graduated** from the engineering technology program:

a. The type of job that I performed was:

- Research c. Sales e. Other (*please describe*) _____
 Repair d. Production

b. The title of my position was _____

c. The starting salary at that position was _____

(For Questions 5-8, you may want to refer to the enclosed course list)

5. The **technical** courses that were **most** helpful to me in my first position after graduating were:

7. The **technical** courses that were **least** helpful to me in my first position after graduating were:

7. The **non-technical** courses that were most helpful to me in my first position after graduating were

8. The **non-technical** courses that were least helpful to me in my first position after graduating were

9. The number of companies I have worked for since graduating is _____

10. I am currently employed: yes no (If no, then answer questions 11-17 about your **last** position)

11. My **current position** is in the field of :

- Research c. Sales e. Management
 Repair d. Production f. Other _____

12. The title of my **current position** is

13. My **current salary** is _____

14. An approximate number of employees at my **current company** is:

- less than 50 50-250 250-999 1,000-9,999 > 10,000

15. How satisfied are you with your **current position**.

- | Very satisfied | Somewhat satisfied | Not too satisfied | Dissatisfied | Very dissatisfied |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

16. If you are dissatisfied or very dissatisfied, why?

17. How likely is it that you will be changing companies during the next 12 months?

| | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Extremely likely | Very likely | Somewhat likely | Very unlikely | Not at all likely |
| 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

18. Courses or skills that would help me in my current position would include:

20. I intend to pursue a graduate degree within the next two years.

yes no have already started have already completed

21. If the answer to question 20 is either yes or already started, what specialty would you pursue?

Engineering Computer Science Management
 Other _____

22. I believe that going for my BSET has helped my career?

| | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Strongly agree | Somewhat agree | Neither | Somewhat disagree | Strongly disagree |
| 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

Biographical Information

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The author is currently an associate professor of electrical engineering technology at New Jersey Institute of Technology. He has a Ph.D. in bioengineering and an M.B.A in marketing, and prior to teaching at NJIT had over twenty years of industrial experience in research, engineering and marketing management in technology corporations.