

A Twenty-Year History: Perspective From the Past

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ABSTRACT

All new graduates of the University of Pittsburgh at Johnstown are surveyed annually by the Office of Career Services. The Engineering Technology Division has done periodic surveys of all its alumni. This paper examines the data collected through these instruments. Conclusions drawn from the results are useful in evaluating the effectiveness of the programs and in planning for the future.

INTRODUCTION

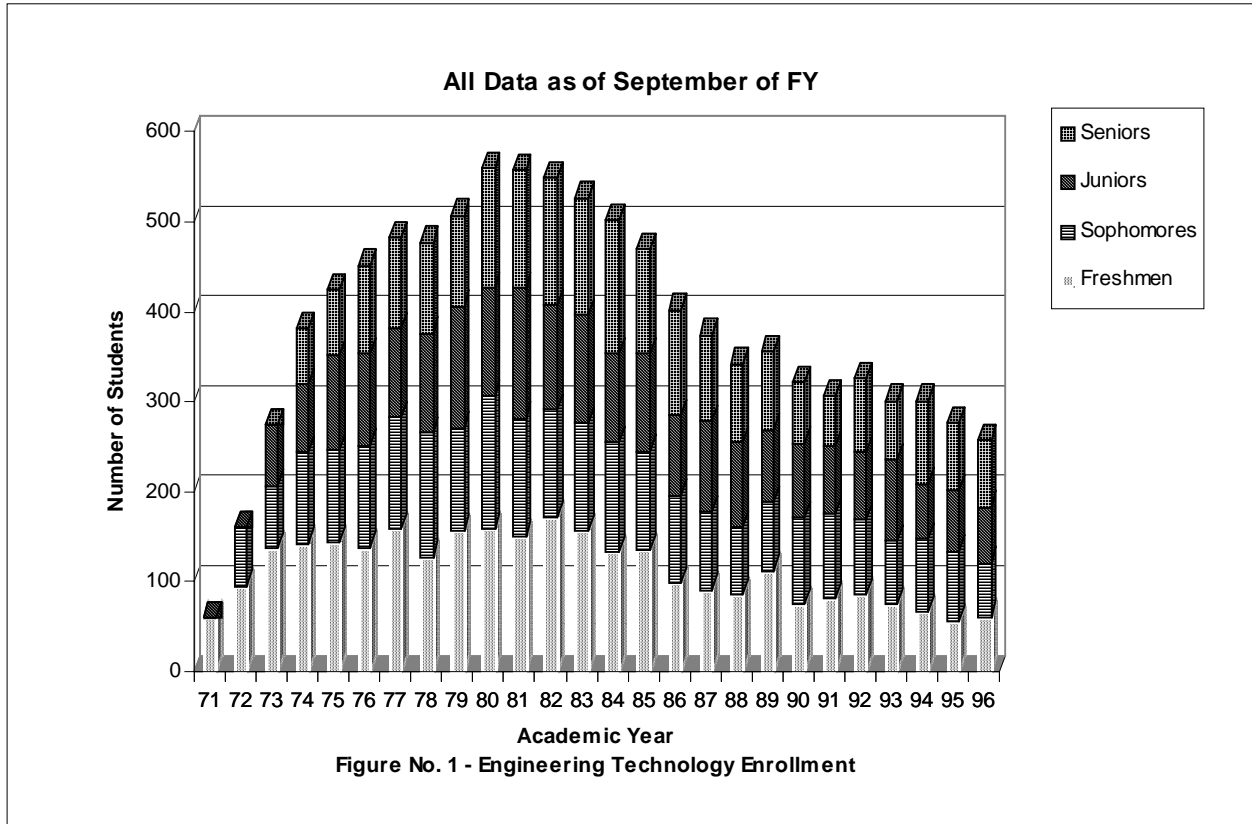
The objective of this paper is to present the results of information obtained from surveys of alumni of the three Engineering Technology programs at the University of Pittsburgh at Johnstown (UPJ) in Johnstown, PA. The alumni data was gathered from two distinct types of surveys. One is an annual survey of each year's graduating class conducted by the Office of Career Services at UPJ. The other is a periodic survey by the Engineering Technology Division of all alumni of the ET programs. The surveys are conducted to gather statistical information about the graduates and to collect subjective information from the graduates and their employers.

History of the Engineering Technology Program at UPJ

As part of the initiation of four-year programs at the University of Pittsburgh at Johnstown, agreement was reached in 1970 between the Johnstown campus and the School of Engineering at the main campus of the University of Pittsburgh to establish a Bachelor of Science degree program in Engineering Technology, exclusively in Johnstown. Prior to 1970, the Johnstown campus served essentially as a two-year feeder program to the main campus. Students were able to complete the first two years of the engineering curriculum in Johnstown. At that time, approximately fifty students transferred annually to the various engineering departments at the University of Pittsburgh, with a few transferring to other schools such as the Pennsylvania State University and West Virginia University.

With the decision to commence the four-year Engineering Technology program at UPJ, an Engineering Technology freshman class of sixty students was enrolled. Civil, electrical and mechanical engineering technology degree options were established. At the start of the program, the Engineering Technology faculty consisted of four professors. The first class of sixty-five students graduated on April 27, 1975. Planned growth in the program brought the peak total full-time day enrollment close to 550 in 1982, with

twenty-one faculty members. In the most recent school year (1996-97) there were 257 students enrolled and eighteen faculty members. There are more than 1900 graduates of the three programs working throughout the United States and in foreign countries. A graphical representation of the enrollment trends for the three programs since 1975 is shown in Figure 1.



How Do You Measure Success?

Every person defines success in his or her own way. Trying to quantitatively measure success is difficult at best. For this paper, individuals are assumed to be successful if they find a full-time job in their field of engineering within one year of graduation and are compensated at a level consistent with other engineering professionals. Continued success is measured on the basis of monetary compensation, graduate job satisfaction, employer satisfaction with the graduate, and attainment of professional recognition or registration. Comparisons are made between data for UPJ graduates and published data for engineering graduates.

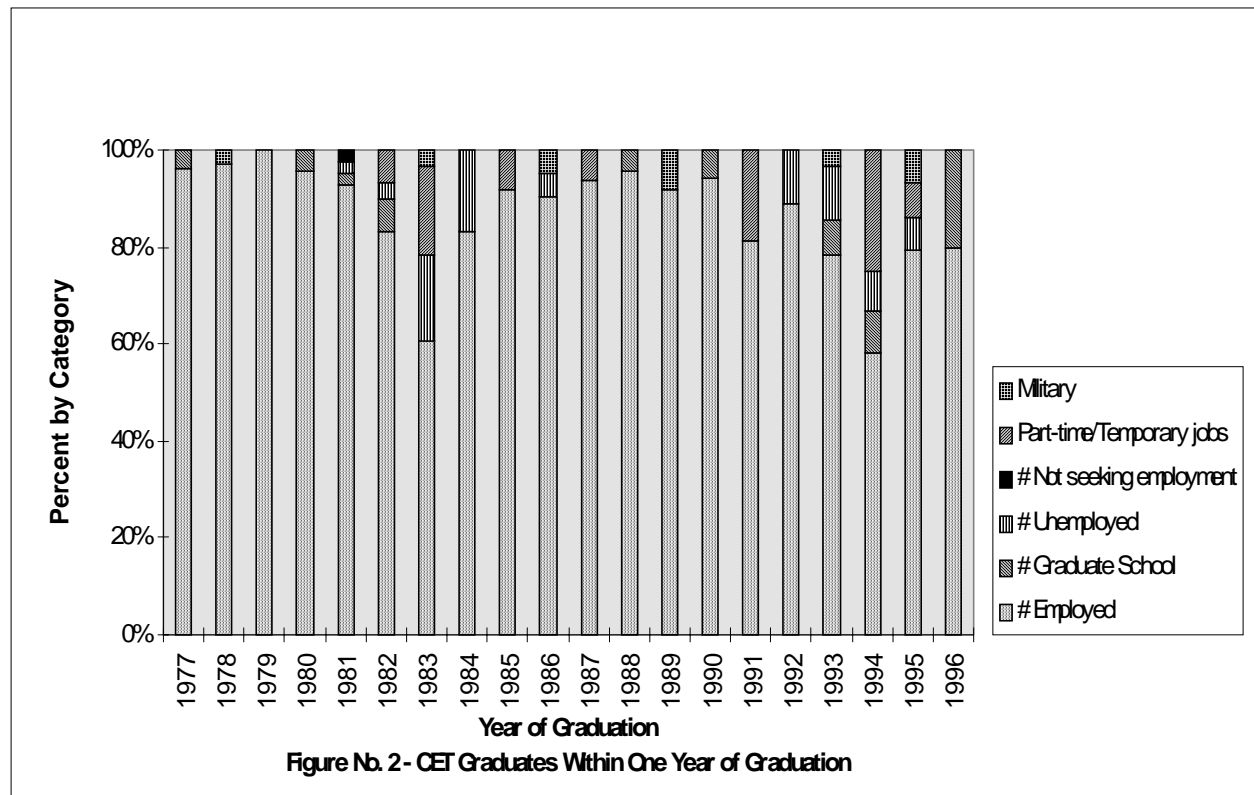
THE SURVEY DOCUMENTS

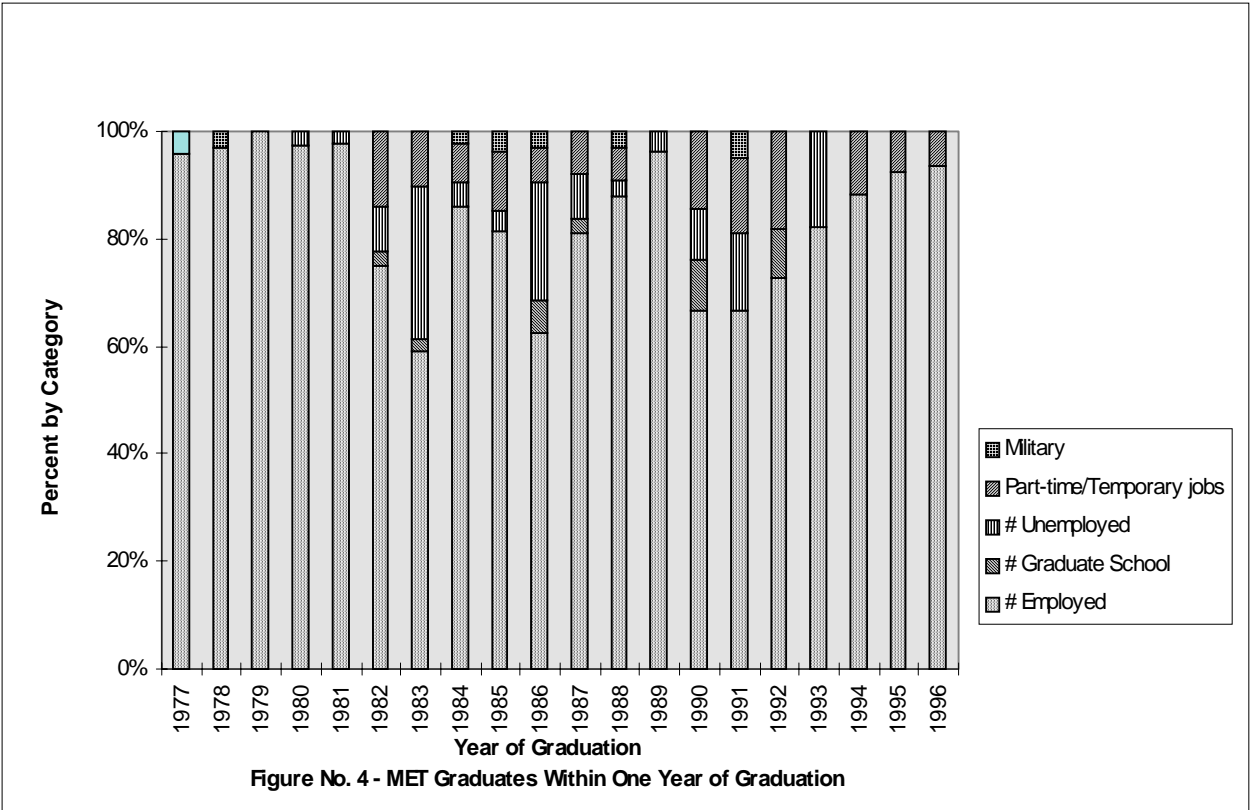
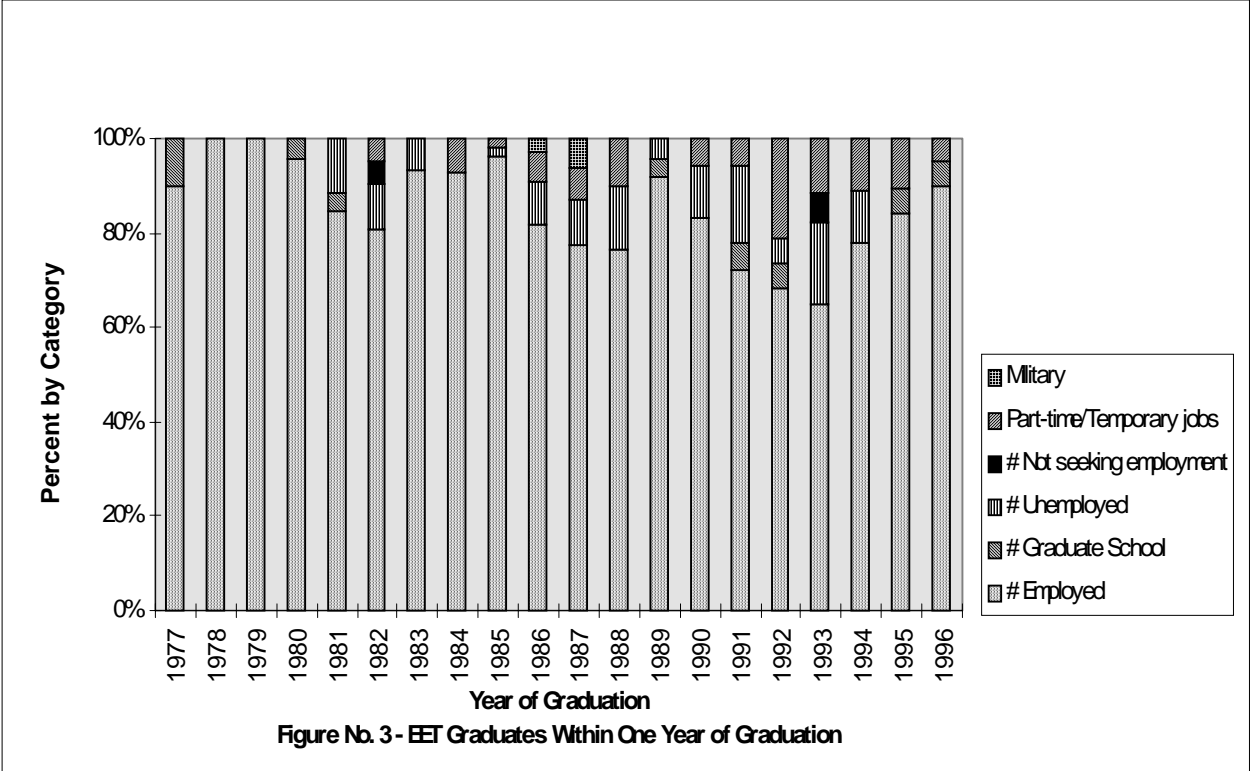
Office of Career Services Graduate Follow-Up Surveys

The UPJ Office of Career Services requests information of each year's graduating class concerning their activities through a graduate follow-up survey.[1] Classes for this survey instrument consist of students that graduate at the end of the fall (December), spring (April) or

summer (June or August) terms of an academic year. The information about graduates is obtained by several different methods. Questionnaires are mailed to graduates in November following their graduation. For those graduates who fail to respond to the first mailing, survey questionnaires are again sent in late December, and again in late January. Finally, attempts are made to call the home of the individual. Information is included only when it comes from the graduate personally or from a member of his or her family.

Since 1977 more than 85% of the ET graduates have responded to these surveys. In 1980 the surveys were revised to incorporate employment status information. Since 1980 students have been requested to indicate their employment status by selecting one of these categories: employed full time, attending graduate or professional school, unemployed, not seeking employment, part time and/or temporary job holder or a member of the military. Figures 2, 3 and 4 graphically depict the results of these surveys for CET, EET, and MET graduates, respectively. Table 1 indicates the results for the graduates since 1980. As indicated, on the average 84% of those responding had a full-time, engineering-related job within one year of graduating. In many cases, students that are not successful in finding employment quickly have limited the area of their job search to a very small, narrowly defined geographical area.





Item	Number or Percent
Engineering Technology Graduates	1447
Respondents to the Survey	87%
Employed Full Time	84%
Attending Graduate or Professional School	2%
Unemployed	7%
Employed Part Time	6%
Not Seeking Employment	<1%
In the Military	1%

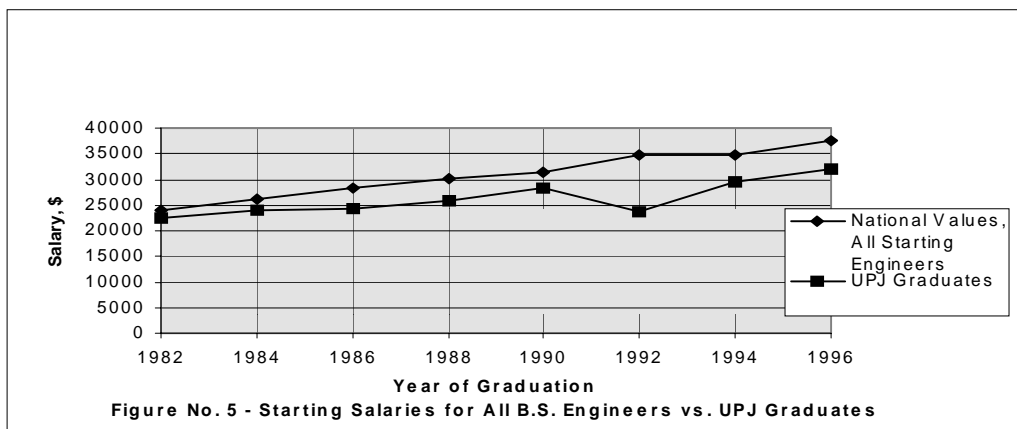
Table 1. Cumulative Graduate Follow-Up Survey Results Since 1980

Additionally, graduates are asked to indicate their job titles. Typical titles for new graduates are indicated in Table 2.

Engineer	Engineer-in-Training
Structural Engineer	Application Engineer
Design Engineer	Sales Engineer
Power-Systems Engineer	Junior Engineer
Engineering Trainee	Engineer Grade I
Field Engineer	Project Engineer

Table 2. Typical professional titles for new ET graduates at UPJ

In 1982 salary data was collected as part of the survey for the first time. A comparison was made between the UPJ graduate data and that collected by the Engineering Workforce Commission of the American Association of Engineering Societies.[2] In June 1996 the Commission published data concerning starting salaries for B. S. engineering graduates of *all* types of engineering programs. That data was compared to the average starting salaries of UPJ ET graduates in Figure 5. At the time of graduation, it appears that UPJ graduates receive salaries that are lower than the national average. It must be noted, however, that UPJ confers *only* CET, EET, and MET degrees, but the national values represent an average of many types of degrees, including those that traditionally have had high starting salaries. The national and the UPJ curves are similar. Table 3 gives a comparison of the UPJ data and the national data.



Year	National	CET	EET	MET	UPJ Average
1982	24100	20690	24330	22670	22560
1984	26250	20430	25710	25760	23970
1986	28350	20500	26750	25800	24350
1988	30100	22100	27500	28300	25970
1990	31450	26000	29140	30000	28380
1992	34650	20250	26270	24870	23830
1994	34900	23750	33420	31000	29390
1996	37500	27800	35820	32500	32040

Table 3. Comparison of National Starting Salaries with UPJ ET Graduate Salaries

Engineering Technology Division Survey Documents

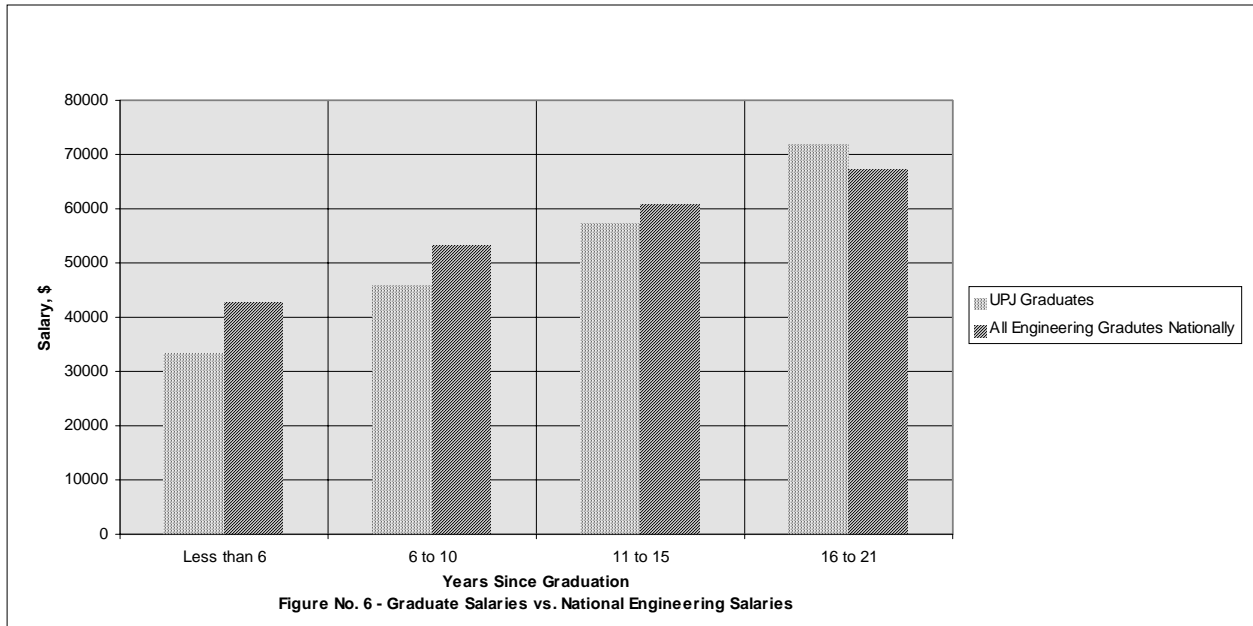
Alumni surveys have been conducted periodically since 1971 to satisfy requirements for TAC/ABET accreditation and to assess the status of graduates and ascertain changes that need to be effected in the programs. For example, the Electrical Engineering Technology program changed the introductory programming language from FORTRAN to C, partially in response to alumni feedback. The Industrial Advisory Board made the same observations as the alumni, resulting in the change.

Survey instruments were developed by incorporating pertinent aspects of those prepared by others with items related to the concerns and philosophical interests of UPJ. It was believed that the response rate would be increased by confining the instrument to a single page. It is expected that the form can be completed in a few minutes. Respondents may make personal comments and observations on the reverse side of the form. Most of those responding made comments.

With each survey the form has evolved to capture only the information needed. The most recently used survey consisted of two single-page forms which were both sent to the graduates. One form requested information from the graduate and the second requested information from the graduate's immediate supervisor. A copy of the alumni form is included in Appendix A. The employer form is included in Appendix B.

The most recent survey was sent in early 1996 to all graduates at their last known address. There were 219 responses. At the time that the survey was mailed, there were 1849 graduates. It is not known how many responses were not received because of inaccurate address information.

Data from the Engineering Workforce Commission was again used for comparison purposes.[2] As indicated in Figure 6, the average salaries of UPJ graduates with job experience have approached or exceeded national averages. The salary figures compiled by the Commission are very similar to those compiled by the National Society of Professional Engineers and presented in the July 1997 issue of the Engineering Times. [3] Job titles that are typical of graduates with ten to twenty years of work experience are shown in Table 4. Ninety-seven percent of the graduates held professional titles.



Chief Engineer	President/Owner
Senior Engineer	Project Engineer
Director of Engineering	Associate Professor
Director	Department Manager
Design Engineer	Team Leader

Table 4. Job Titles for Graduates with 10 to 20 Years of Experience

Of the 219 graduates that responded, 187 (85%) identified themselves as successfully completing the Fundamentals of Engineering exam or as being a registered professional engineer. For the FE exams administered in October 1996 and April 1997, EAC/ABET students taking the exam for the first time had pass rates of 83% and 86%, respectively. First-time students from non-EAC/ABET programs had pass rates of 61% and 58%, respectively.[4] Assuming that the respondents are typical of all UPJ graduates, they are as successful in passing the FE exam as are the EAC/ABET graduates.

From the Employer's Point of View

Employers are very satisfied with the UPJ graduates. An overwhelming majority of the employers that responded to questionnaires indicated that they would hire UPJ graduates again. Written comments praised the contributions made by the graduates and acknowledged that they were competent. Some typical comments were:

- “The graduate is very much an asset to the function of the office. He was well prepared.”
- “The general curriculum was appropriate to provide the graduate with a systematic problem-solving approach needed for engineering. It also provides basic fundamentals from which to develop a more refined expertise.”

- “UPJ’s ‘hands on’ program prepared him excellently for his job assignments.”
- “She was able to be productive her first day on the job.”
- “He is one of the best employees I have ever been associated with in 30+ years of service.”
- “He came to us better prepared than most graduates in my experience.”
- “She has been a positive addition to our staff.”

SUMMARY

For the past twenty years students have been graduating from the engineering technology programs at UPJ. The Engineering Technology Division is proud of its graduates and their successes. Graduates appear to be well compensated in their fields and contributing members of their professions. The annual and periodic surveys provide the Engineering Technology Division with data which is helpful in planning for the future. Feedback from alumni can be used to determine curriculum changes and modifications. Positive comments from both graduates and their employers indicate that the curriculum and direction of the division are on course. The comments also indicate that the graduates have the ability to adapt to the changing environment and keep pace with new technologies.

ACKNOWLEDGMENT

The authors would like to thank the Office of Career Services and its director, Mr. Ronald Rovansek, for their assistance in the collection of the graduate data.

REFERENCES

- [1] University of Pittsburgh at Johnstown/Office of Career Services, “Graduate Follow-Up Survey,” 1975 to 1996.
- [2] Engineering Workforce Commission of the American Association of Engineering Societies, “Compensation, 1996: Finally, Real Improvements in Pay,” Engineers, Vol. 2, No. 3, July, 1996, p. 3.
- [3] Farrell, M., “Income Survey Gives U.S. Snapshot of PE Pay,” Engineering Times, Vol. 19, No. 7, July 1997, p. 10.
- [4] Siegel, D., “Do EAC-ABET Grads Deserve FE Exam Exemption?” Engineering Times, Vol. 19, No. 10, Oct. 1997, p. 11.

BIOGRAPHICAL INFORMATION

JAMES L. HALES is associate professor and head of EET at the University of Pittsburgh at Johnstown. He has been with the university for 24 years. He taught in Jilin, China, in 1992-93. Prior to joining the university he was an application engineer in the industrial power systems department for six years and a field service engineer for two years with General Electric Company in Schenectady, NY and Beaumont, TX.

BEVERLY J. HUNTER is associate professor and head of CET at the University of Pittsburgh at Johnstown, Johnstown, PA. She has been with the university for 15 years. Prior to joining the university she was a facilities engineer for the Abex Corporation in Hollsopple, PA, and a power engineer for the Allegheny Power Service Corp. in Greensburg, PA.

APPENDIX A

UPJ ENGINEERING TECHNOLOGY

GRADUATE QUESTIONNAIRE

NAME _____ MONTH/YEAR OF GRADUATION _____

HOME ADDRESS

MAJOR: ___CET ___EET ___MET

HOME PHONE NO. _____

EMPLOYER _____ BUSINESS PHONE NO. _____

BUSINESS ADDRESS

FAX NO. _____

E-MAIL ADD. _____

JOB TITLE: _____

PRESENT SALARY: _____

(strictly confidential - to be used in composite salary

survey)

JOB DESCRIPTION:

CHRONOLOGICAL LISTING OF PROFESSIONAL POSITIONS SINCE GRADUATION:

ADVANCED DEGREES: _____

ADDITIONAL NON-DEGREE EDUCATION: _____

FUTURE EDUCATIONAL GOALS: _____

ENGINEER-IN-TRAINING: _____ Year

REGISTERED PROFESSIONAL ENGINEER: _____ Year _____ State

Using the scale numbers below, rate the following:

1) Excellent 2) Above Average 3) Average 4) Below Average 5) Poor

_____ a) Your satisfaction with your engineering technology education

_____ b) Your satisfaction with current and past professional employment

Please add comments on the reverse side of this sheet!

APPENDIX B

Confidential

Return to: James L. Hales
Interim Director
University of Pittsburgh at Johnstown
Johnstown, PA 15904

EMPLOYER SURVEY FORM
(information required for reaccreditation evaluation)

NAME OF GRADUATE/EMPLOYEE: _____

DATE OF GRADUATION: _____ MAJOR: _____ CET _____ EET _____ MET

EMPLOYEE'S JOB TITLE: _____

EMPLOYEE'S ANNUAL SALARY: _____
(This information is for statistical purposes only and will be maintained confidential.)

SUPERVISOR'S NAME: _____

SUPERVISOR'S TITLE: _____

COMPANY/DIVISION: _____

CITY AND STATE: _____

The following portion to be completed by the employer.

Was the graduate well-prepared for the job? _____

What deficiencies (if any) do you feel the Engineering Technology Program has for this job?

Would you hire other graduates from this Engineering Technology Program?

Other Comments: _____

Date: _____ Signed: _____
(Supervisor)