An Analysis of Industrial Technology (IT) Programs in Meeting Students Needs: A Survey of IT Alumni

By Dr. Ahmad Zargari & Mr. Robert Hayes

KEYWORD SEARCH

Administration
Curriculum
Research

Reviewed Article

An Analysis of Industrial Technology (IT) Programs in Meeting Students Needs: A Survey of IT Alumni

By Dr. Ahmad Zargari & Mr. Robert Hayes

Ahmad Zargari, Ph.D., CSIT is Morehead State University's NAIT Student Chapter Advisor, a senior member of SME, and is also a member of EPT, NAITTE, ITEA, and NASTS. His research interests are in Industrial Technology graduate programs, job market for industrial technology, alumni and employers' feedback, microprocessors, TQM, SPC, and DOE.

Mr. Robert Hayes, CME, is the IET Department Chair at Morehead State University. He has been a NAIT member for more than two decades, and is a senior member of SME, a member of EPT and past president of Kentucky Technology Education Association. His research interests are in applied technical research, program evaluation, manufacturing processes, quality control, CIM and CNC machining.

Introduction

In recent years, because of a national concern over the content and quality of education that college students are receiving, there has been an increasing emphasis in performance assessment of university programs in order to determine the relevance and quality of the education being provided. Since students are the "customers" and alumni are the main "product" of higher education institutions, their perceptions and feedback can be used as an indicator of thequality of educational programs.

The primary mission of Industrial Technology discipline is to prepare management-oriented technical professionals. The alumni survey can be used as an effective tool for soliciting opinions from graduates about the quality of the completed program. This manuscript presents data obtained from IT alumni regarding their achievements, qualifications, positions and responsibilities, promotions, strengths and weaknesses. It is hoped that this data could be used to improve the quality of Industrial Technology programs by forming the bases for a self-assessment.

Background

In recent years, there has been an increasing public interest in the accountability of United States colleges and universities. Educational policy-makers have called for the examination of higher educational programs in order to enhance their responsiveness to the needs of students. According to Weistroffer & Gasen (1995),"Calls for outcome standards and performance assessment have been made at national and state levels to address the quality of education being provided in colleges and universities today" (p. 258).

Describing the critical objective of higher education institutions during a time of rapid social and technological change, the philosopher Alfred North Whitehead wrote in his preface to *Aims of Education*, " . . . Pedants sneer at an education that is useful. But if education is not useful, what is it . . . ?" (p. 2). Clearly, the primary purpose of education is to prepare informed and productive citizens and feedback from alumni is fundamental to determining the level of success programs have attained.

In response to those critics who lament that the university's mission is to focus only on the student's intellectual development, Whitehead (1957) noted that, "In the modern complex social organism, the adventure of life cannot be disjointed from intellectual adventure" (p. 94-95). Since university graduates are prepared to successfully perform their social functions as productive citizens, their input is critical to the revision and reorganization of educational programs.

Because alumni care about the performance of their alma mater, a high quality institution should systematically collect information from its graduates and make appropriate adjustments in programs and policies in order to enhance the student's intellectual and professional development (Astin, 1985; Bok, 1986; Boyer, 1987).

A customer satisfaction survey is one of the most common and effective means for obtaining information about an organization and its product and services (Besterfield, Besterfield-Michna, & Besterfield-Sacre, 1998). The quality of an educational program to a great extent depends on the performance of its graduates on the job.

Emphasizing the importance of alumni performance on the job as an indicator of IT programs quality, the National Association of Industrial Technology 's accreditation guidelines require that systematic studies be conducted on the performance of IT graduates. According to the Industrial Technology Accreditation Handbook (1998), "The advancement of [IT] graduates within organizations shall be tracked to ensure advancement to positions of increasing responsibility . . . . Follow-up studies of graduates should be conducted every two to five years" (p. 33).

A review of literature indicates that some institutions of higher learning such as the University of Lowell have conducted national surveys of their technology program graduates in order to determine the quality of the degree program (Tuholski & Marchand, 1986). In addition, Edwards (1990) conducted a survey of the San Francisco State University's Department of Design and Industry alumni in order to evaluate the content of core courses.

With regard to the importance of alumni input to IT programs, a Delphi panel of chairpersons of accredited IT programs identified alumni involvement as an extremely important research topic for industrial technology (Butler, Izadi, and Toosi, 1995). Additionally, in a survey to determine important research agendas for industrial technology, IT graduate faculty placed their highest priority on assessment of IT programs, curricula, and courses (Zargari & Coddington, 1998).

The Survey

In 1997, Morehead State University's Industrial Education and Technology faculty decided to randomly administer alumni surveys to assess the quality of IT program (Morehead State University Undergraduate Catalog, 1997-98). In order to obtain relevant information about the IT program and options, a survey was administered to the most recent graduates (1989-1994). A 15-item two-page questionnaire was pilot-tested for clarity and appropriateness by a number IT faculty members and alumni (a copy can be obtained from the authors).

The University's Alumni Relations & Development provided a total of 220 current addresses of IT alumni who graduated from 1989 to 1994. From the total of 220 graduates, a sample of 100 individuals was randomly selected. To increase the return rate, the alumni were also contacted by telephone and fax. Of the 100 questionnaires mailed, 41 were completed and returned, for a 41% return rate.

The purpose of the survey was to assess the quality of the IT program through the eyes of its alumni. The following questions were addressed in this study:

1. What are key characteristics of IT alumni?
2. What is alumni's highest academic degree and qualifications?
3. What are alumni's perceptions and opinions about the completed degree program?

Survey Results

The survey results are presented in the following categories:

Age-gender.

Table 1 displays the participants' age and gender.

Highest Degree Earned

Table 2 displays the highest academic degree earned.

Employment Status

Table 3 presents the participants employment status.

It is important to note that none of the graduates were employed before they enrolled in the IET Department. Twelve percent (5 respondents) were employed before graduation and 88 percent (36 individuals) were employed after graduation.

Position-Responsibilities

Eighty percent of the participants believed that their present occupation was directly related to the program of study (80% yes, 20% not).

Time Required for Completion of the Degree

Seventy-eight percent graduated in four years or less, 17% completed the degree in four and half years to six years, and only 5% graduated after six years.

Table 1. Age and Gender

Years (age)	Percent	Gender	Percent
25 - 30 years	70%	Female	2%
Over 30 years	30%	Male	78%
		Not reported	20%

Table 2. Highest Degree Earned

Degree	Percent
B.S.	80%
MS	12%

Table 3. Employment Status

Status	Percent
Full time	93%
Part time	2%
Unemployed	2%
Unemployed (disabled)	2%

Table 4. The Value of the Program

Value	Percent
Failing	2%
Poor	0%
Average	12%
Good	63%
Excellent	21%

Promotions

Fifty-one percent of respondents were promoted to new positions after completion of the program.

Perceptions of the Program

Table 4 illustrates the individuals' opinions about the program.

While 14% of the 41 respondents placed a rating of average or less, the majority (85%) believed the program was good or excellent. It should be noted that 85% would recommend the program to others.

Graduate Education

While almost 88% of participants (36 individuals) have not yet enrolled in a graduate program, 12% (5 respondents) have enrolled in a Master's program. Sixty-three percent of respondents (25 individuals) were planning to enroll in a graduate program.

Table 5 displays the participants' preferred graduate programs using the following scale: 1 = least preferable — 10 = most preferable

Culminating Experiences

The culminating experience of the program as reported by majority of respondents was rank-ordered as follows:

1. Independent projects
2. Practical job-based projects
3. Cooperative education
4. Supervised work experience

Subject Matter

The respondents were asked to rate courses/subjects taken as part of their degree in terms of importance to their present occupations. Table 6 displays the courses in terms of their importance based on the following scale: 1 = lowest value; 10 = highest value.

Strengths

The following items were most frequently mentioned as the strengths of the program:

1. Laboratories
2. Technical courses
3. Hands-on projects
4. Cooperative education
5. Small size classes
6. Program flexibility
7. Multidisciplinary
8. Field trip
9. Advising
10. Dedicated faculty
11. Work-related Courses such as Quality Control, Industrial Design, Robotics, CAD, Surveying, and Electronics.

Weaknesses

The following were frequently mentioned as weaknesses of the program.

1. Old/outdated equipment
2. Not enough upper level courses
3. Large size Labs
4. Not enough field trips
5. Not enough faculty

Improvements

Majority of the respondents stated that the program should be improved in the following ways:

1. Add new equipment.
2. Add more practical hands-on projects.
3. Internship/Cooperative education must be required.
4. Night classes should be available.
5. More field trips needed.
6. Offer more technical courses.
7. Need to have accredited programs.
8. Establish Masters Degree in Technology
9. Require real-world design projects.

Satisfaction

Table 7 displays the respondents' rating of the academic services they received while completing the degree based on the following scale: 5 = very satisfied; 4 = satisfied; 3 = neutral; 2 = dissatisfied; and 1 = very dissatisfied.

Table 5. Graduate Programs

Programs	Mean Rating
Master of Technology in Manufacturing	7.3
Master of Technology in Electronics	6.3
Master of Technology in Quality Assurance	6.3
Master of Vocational Education	3.8
Master of Education	3.3

Table 6. Importance of Courses

Subject/Courses	Mean Rating
Technical content	9.2
LAB experiments	8.6
Internships/on-site projects	7.5
Cooperative education	6.5
General education	6.1
Courses without LAB	5.7

Table 7. Satisfaction

Items	Mean rating
Advising/mentoring	3.95
Teaching	3.90
Lab experiments	3.80
Field trips	3.60
Counseling	3.25
Cooperative education	3.10
Tutoring	2.80

Table 8. Individual Perception

Strongly agree	36%	Disagree	4%
Agree	49%	Strongly disagree	7%
Don't know	2%		

Perceptions

Table 8 displays the participants' responses to the following statement. *I believe I am a more competent professional because of earning a degree in Industrial Technology.*

Comments

The comments made by respondents are as follow:

1. I work for Kentucky Power Company. I do about 99% of what an electrical engineer job is.
2. I am a plant engineer in Ashland, KY at Pennco, Inc.
3. Technology is 2nd to none. World growth relies on it.
4. I feel IET Department gave me a well-rounded base to build on.
5. IET relates well to the U.S. industry.
6. I have worked with people with similar degrees from other schools and I feel better qualified.
7. It is a very good program, which gives you the tool to grow.
8. IET gives students many different options.
9. I liked the small classes with all the hands-on experiences.
10. IT Department has an excellent staff. However, the curriculum needs updating.
11. The instructors all advocated on-the-job experience as a part of curriculum.
12. The program has good options, good overview of different techniques.
13. The basics are excellent, but could you have more real life situations?

Summary

For Industrial Technology programs to stay on the leading edge of the profession, it is critical that their curricula and policies be systematically examined and revised. The results indicate that the majority of IT graduates have been able to enter the workforce in a position related to their field of study, and are satisfied with their occupations. A large number (63% of the respondents) are interested in completing a masters degree. The graduates' responses to the overall value of their technical, lab-based courses, teaching and advising, internships, and cooperative education are very favorable. The fact that the majority of respondents (85%) believe that they are a more competent professional because of earning an IT degree is an indication of alumni satisfaction and program quality.

The opinions and perceptions of IT alumni who are functioning as technologists in industry, business, and educational organizations can be utilized to assess the quality of programs. Although NAIT has recognized the importance of IT graduates feedback by requiring the accredited programs to conduct alumni survey and disseminate the results, a review of literature indicated that very limited research data is available on alumni perceptions of IT programs. The current survey, though very limited in scope, can be used to develop and conduct further studies at all levels.

References

Astin, W. A. (1985). Achieving educational excellence. San Francisco, CA: Jossey-Boss.

Besterfield, D. H., Besterfield-Michna, C., Besterfield, G. H., & Besterfield-Sacre, M. (1998). Total quality development. Upper Saddle River, NJ: Prentice Hall.

Bok, D. (1986). Higher learning. Cambridge, MA: Harvard University Press.

Boyer, E. L. (1987). College: The undergraduate experience in America. New York, Harper & Row Publishers.

Butler, C. L., Izadi, M., & Toosi, M. (1994-95, Winter). Research topics for industrial technology. Journal of Industrial Technology. 39(1), 11-14.

Edwards, J. G. (1990). The alumni survey of core course value as a student and in career. Journal of Industrial Technology, 6(2), 13-16; 34-36.

Industrial Technology Baccalaureate Program Directory (1997). National Association of Industrial Technology, Ann Arbor, MI.

Tuholski, R. J., & Marchand, C. (1986). Following the University of Lowell IT graduates. Journal of Industrial Technology, 2 (4), 2-3; 14-15.

Weistroffer, H. R., & Gasen, J. B. (1995). Assessment of information system programs. Journal of Education for Business, 70(5), 258-262.

Whitehead, A. N. (1957). The Aims of education and other essays, Free Press, pp. v2.

Zargari, A., & Coddington, C. (1998). Development of research agendas for industrial technology. Journal of Industrial Technology, 14 (4), 8-10.