AC 2008-2745: EMPLOYABILITY FOR ENGINEERING AND TECHNOLOGY GRADUATES

Stephen Hundley, Indiana University-Purdue University-Indianapolis
Stephen Hundley is Associate Professor of Organizational Leadership in the Purdue School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI).

Amanda O'Neill, Indiana University-Purdue University Indianapolis
Amanda O'Neill is a senior in organizational leadership and supervision in the Purdue School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI).

Terri Talbert-Hatch, Indiana University
Terri Talbert-Hatch is the Assistant Dean for Student Services in the Purdue School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI).

Joshua Killey, Indiana University-Purdue University-Indianapolis
Joshua Killey is Director for the Office of Career Services and Professional Development in the Purdue School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI).

Elizabeth Wager, Indiana University-Purdue University Indianapolis
Elizabeth Wager is a Lecturer of Technical Writing in the Purdue School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI), where she is also pursuing a master's degree in applied communication.
Employability for Engineering and Technology Graduates:
Educating for Results

Abstract

Are college graduates in the United States adequately prepared for the jobs that are available to them within their chosen field? Many companies that recruit and hire recent engineering technology graduates report that there are significant gaps between the skills that are needed for the professional world and the abilities of the graduates. The need for an engineering technology-related postsecondary degree has multiplied greatly in the past few years; however, the recent graduates may not be completely ready for the positions available to them. The issue at hand is to determine such gaps and adapt the current curricula in a fashion that closes the gaps.

Currently, there are many ways to assess collegiate level learning; however, there are vague, emerging, and/or incomplete ways to determine the extent to which students possess the “value-added” skills which refer to the thinking skills and knowledge that should occur. Some educators believe that the emphasis in college-level education should be placed primarily on the student’s specific field of study, such as engineering technology discipline-specific concepts. Employers and others from the professional world would like to see more student preparation in areas such as business etiquette, communication, and professionalism. Accreditation bodies, such as ABET, strive for both.

This undergraduate student research paper will address questions pertaining to necessary job skills, and areas in which graduates lack necessary skills. This data will be gathered from industry professionals who frequently hire college graduates, as these individuals know precisely what skills are needed in the job market, and can from their experience make recommendations for improvement. Specific gaps in the engineering technology college curriculum will be identified, and recommendations for students, faculty, administrators, employers, and policymakers will be described. Implications for policy, practice, improvement, and research will be discussed.

Introduction

Although undergraduate graduation rates have increased by 17.4 percent, 40 percent of the companies hiring could not find qualified job candidates. Recent graduates lacked competency in one or more of the following areas: computer and technology, written and oral communication, basic math and problem solving, and being a recognized leader or member of clubs or organizations on or off campus.

The research discussed here will review the employability of graduates from today’s collegiate campuses. Specific attention will focus on select engineering technology programs at Indiana University-Purdue University Indianapolis (IUPUI), in an attempt to identify what gaps, if any, exist in the curriculum. Qualitative information will be gathered via interviews of corporations that have been identified as successful firms that hire entry level, supervisory positions.
Data will be analyzed to produce quantitative results to display areas in which undergraduate programs are not effectively preparing students. Gaps in the knowledge, skills, and abilities of graduates will then be applied to the undergraduate supervisory programs producing graduates. This research seeks to identify whether undergraduate student education is adequate to compete in the corporate world. Additionally, the research seeks to identify which areas outside the academic are essential for placement in premium positions.

**Research Problem**

This research seeks to identify gaps in the collegiate curriculum at IUPUI in a select engineering technology degree programs that may leave college graduates less than prepared for today’s workforce. The need for a post-secondary degree has multiplied greatly in the past few years; however the influx of graduates who are not completely ready for the positions available may stem from an archaic belief in holding to the boundaries of a traditional undergraduate curriculum. In a dynamic global and technology-driven economy, college graduates must possess all tools needed to transition from classroom to boardroom. This research seeks to examine the knowledge, skills, and abilities (KSAs) of recent graduates, to evaluate the improvements required to allow students to be more qualified entry-level candidates, and to establish standards for assessment of learning relating to both the general education framework established by IUPUI and the courses taken by a specific group of undergraduate students about to enter the workforce.

The scope of this type of research could cover a vast spectrum of students, related institutions, and organizational stakeholders; however, it is difficult to apply organization research to all academic areas or to research the needs of all target employers. As a result of these challenges, narrowing the scope of the study and defining the problem and research questions will help limit the information needed to establish a specific set of KSAs common to all employers hiring engineering technology graduates for entry-level supervisory, technical, and professional positions and the information needed to assess the current curriculum. Learning assessments at the college level are difficult to obtain; primarily because the learning that takes place at the post-secondary level is more than data and facts, but also patterns of thinking and conceptual information. Some students can apply the theories to contextual settings and some cannot translate learning to action.

Some educators believe that the emphasis and thus the courses required in college-level education must be dominated by each student’s specific field of study, such as computer programming, medicine, etc. Others, including many people in the business world, would like to see more emphasis on soft skills in areas such as business etiquette, communication, and professionalism. Both sides of the argument are difficult to dispute; and, in some areas of study, it is easy to understand the need to amass volumes of knowledge at the microscopic level – but this is not the case for most supervisory roles. To make this research reliable, the KSAs and associated gaps must be derived from reliable organizational stakeholders and clearly articulated to the degree-awarding institutions.
This research will address questions pertaining to job requirements, and areas in which graduates lack necessary skills. This data will be gathered from industry professionals who frequently hire college graduates into entry-level supervisory or management roles. These individuals know precisely what skills are needed in the job market and, based on their knowledge and course-specific assessment for these skills, the research will lead to a set of recommendations for improvement.

**Topic Significance**

This research will impact college students, educators, and leaders within all organizations hiring entry-level supervisors. College students earn degrees with the expectation it will benefit them when seeking a job. Employers anticipate that recruited supervisors with a college education will be better suited for jobs. They hope this strategy will save a lot of time, energy, and money in training. Additionally, recruits will have an overall ability to work within the organization. College educated graduates are expected to be more capable not only in regards to task completion, but also concerning overall ability to work with people and communicate effectively.

Discussion regarding the ability of graduates to find jobs within their chosen field of study has been ongoing. Many students find it hard to get a job once they have their degree. With the increasing number of students earning degrees, the job market is remarkably competitive. Should this research reveal gaps within the general curriculum at the collegiate level, there will be a basis for adapting the curriculum concentrations. These adaptations will benefit all groups of people listed above. I hope implementation of this data would make individuals more adequately prepared to fill the positions in recruiting companies. These companies will save money previously used to train new employees. The customers of every organization will be better served. Consumer business transactions by under-qualified people with ineffective communication skills are replaced by new recruits who are the top in their fields.

Professors of higher education will fulfill expectations of society if changes can be made to increase the employability of recent graduates. College educated students will no longer be under-qualified for the top level positions they desire. Members of society will feel more confident that the premium price paid for a college education will be worth the cost. At the institutional level there are additional concerns. If the graduates from this campus are not obtaining jobs, a negative impression of this university can develop. Should this institution not adequately prepare its students, the possibility of a decline in enrollment exists. Potential students would be unlikely to attend an institution that has a reputation for producing under-qualified graduates.

**Review of Literature**

**Introduction**

Are college graduates in the United States adequately prepared for the jobs that are available to them within their chosen field? Many companies that recruit and hire recent college graduates report that there are significant gaps between the skills needed for the professional world and the abilities of the graduates\(^1\)\(^2\). The issue at hand is to determine such disparities and adapt the
current curriculums in a fashion that fills in the holes. Currently, no concrete way exists to assess collegiate level learning, or the “value-added” skills which refer to the thinking skills and knowledge that should occur\(^3\).

Statistical data from the 2006 United States Census states that the median income of college graduates is nearly double the income of high school graduates (Table 675)\(^4\). However, evidence also shows many unemployed people possess college degrees (Table 615)\(^4\). This article will show evidence for methods in which post-secondary institutions can improve their graduates’ ability to enter the labor market.

Surveys show definite areas in which the professional world would like to see improvement in skills offered by graduating college students\(^1\). This article seeks to evaluate the current methods for assessing post-secondary learning, determine the skills that employers seek to hire, and analyze the methods of educating undergraduate students.

**Measuring Graduate Learning**

While elementary schools are continually evaluated via standardized testing, post-secondary schools are not monitored in such a fashion. Colleges and universities are not regulated by a government controlled curriculum; therefore each school must decide what students need to learn. “Value-added” refers to the mostly undefined measurement of the thinking skills and body of knowledge that graduates should learn\(^3\). Currently, the United States Department of Education is investigating the idea of creating standardized tests for post-secondary institutions. The United States government is responsible for 24 percent of all money spent in higher education, and regulates nothing. In contrast the government pays only 10 percent of funding for K-12 schools\(^3\). However, the government can implement a freeze of the accrediting agencies that approve colleges who are performing sub-par.

It is the opinion of collegiate officials that standardized tests are not a good indicator of undergraduate learning. A student’s ability to regurgitate facts, does not demonstrate how well they will be able to perform in their chosen field. Instead a better instrument includes evaluation of the graduates who are functioning well within graduate programs or within their chosen career field.

**Current Statistics**

Data from 2004, contained in the 2006 census states that there are 39,293,000 college graduates employed. In contrast, only 35,944,000 individuals holding just high school diplomas are employed (Table 607)\(^4\). Data from 2003, indicates 2.8% (577,000) of bachelor’s degree graduates, while employed, are below the poverty level (Table 699)\(^4\). The unemployment rate for high school graduates in 2004 was 5.0%. The rate for college graduates was only slightly more than half of that at 2.7% (Table 615)\(^4\).

**What Employers Want**
Survey results of 104 Silicon Valley employers indicated that employers were not satisfied with the communication skills demonstrated by recently graduated new hires. Both oral communication and written communication skills need improvement in most cases. Communication skills are considered to be a top priority for both gaining and retaining employment, according to published reports from the Department of Labor’s Secretary’s Commission in Achieving the Necessary Skills. The author notes that information from this report is somewhat outdated. No recent studies regarding employer satisfaction has been conducted since the early 1990’s in the specific field of education.

In comparison, a study completed regarding competencies of graduates within more technical fields, such as Information Systems, also found that “68% of CIOs said that ‘soft skills’ such as communication and team building are more important today than five years ago” (pg 1). A gap exists between what employers expect from academic programs and what they discover in newly hired graduates. Paramount to all skill sets, the ability to learn is crucial. Many fields require ‘retooling’, or learning new approaches and technologies. Instructors at the post-secondary level must foster the ability to learn through “incorporating sufficient challenge into course assignments and projects,” (pg 6).

There are two categories that employers fall into: those who are hiring to fill a specific job, and those hiring for raw skills. Many graduates do not possess the necessary work-related experience and skills that are necessary to be competitive. Research concludes that graduates need to have more job-related experience, communication and team-work skills. Employers also indicated that an increased focus on professionalism, etiquette, and business manners would be desirable.

The Need for Transferable Skills

Skills that can be moved from one job to another are known as “transferable skills”. Developing transferable skills will benefit not only the student but also all organizations with which they will work. Research, writing and communication skills all fall into this category. These types of transferable communication skills create a resume that portrays developed abilities and not just tasks that can be completed. Emphasizing transferable skills improves a person’s ability to move between fields; perhaps even into a field in which no degree is held.

Authors from the United Kingdom offer a differing opinion. While they agree that such transferable skills are necessary, it is not always the lack thereof that presents a problem for graduates. The authors find that other factors, such as gender and socioeconomic differences, may play a larger role than most think. The skill of decisive decision making may be sought out by an employer, however they may desire this trait in a man, and find it less appealing in a woman.

Assessment of Learning vs. Acquisition of Skills

The RAND Corporation’s Council for Aid to Education (CAE) developed an approach to assess the “value added” of higher education systems. This project was called Collegiate Learning Assessment (CLA). CLA focuses not one the specific content of the curriculum but on general
education skills such as critical thinking, reasoning and written communication\textsuperscript{9}. This project demonstrated in importance of a student’s ability to use information, rather than to just memorize facts and processes. By focusing on general education skills, it is possible to compare a number of institutions across the entire sector of higher education\textsuperscript{9}.

Researchers from the United Kingdom conducted research to develop an approach that “embeds employability in the design of a university degree scheme using skill sets\textsuperscript{10}.” In their research it was evident that direct involvement of employers was needed to identify necessary skill sets. Their approach encompasses the full range of skills, both non-technical and technical in nature. This allows for a skill set that the graduates consider employable in terms that employers will understand\textsuperscript{10}. The identification of these skill sets by employers to the university develops a clear path towards the degree being sought. Such a path is then clearly articulated to prospective students.

\textbf{Making it Work: How to Educate}

While many students are becoming aware that academic credentials alone do not secure jobs, not enough are making changes. “Some have not realized that graduate employers are interested in their part-time work, volunteering, and all non-directly related employability skills\textsuperscript{2}.” A participant from another study indicated that academics are only one key element to success\textsuperscript{1}. The other two key elements found to be highly important are experience, through internships and special projects, as well as leadership, found through campus activities for example. Overall, the research conducted indicates that non-technical skills are rated even higher than technical skills\textsuperscript{1}. Similarly, other research concludes that the intensity of writing standards as well as public speaking, interviewing skills, and business etiquette should be increased in an undergraduate curriculum\textsuperscript{5}.

One researcher produced a list of 12 keys to educating for employability\textsuperscript{11}. Curriculum should include professional development activities. Students should also be instructed on building portfolios that provide a representation of the skills and traits employers value. The pattern of classroom instruction also provides added value to the students. Role playing/simulations, as well as group discussions and problem-solving exercises prove to be more valuable than lectures\textsuperscript{11}.

While there is much discussion in academia concerning what should be taught, professionals who hire college graduates have their own opinions. With the increasing number of college graduates it is important that students be extremely well prepared for the professional world. However, there is not much information that shows the best way to educated students. More research needs to be conducted to determine how educators should change the current system for instructing in the country’s undergraduate programs. Once these practices are developed, equal work should be invested in creating a method for assessing learning at the collegiate level. This method should be different than assessments performed at elementary and secondary level, primarily because college learning is more than memorizing facts.
Research Methodology

To adequately cover this problem area, both qualitative and quantitative data is necessary. Many people are affected, at different levels, by college graduates not being prepared for the workforce. Research will be conducted not only to determine why graduates aren’t prepared, but statistical data that precisely states how many top quality employers are not impressed.

Interviews

The researchers admit that the sample size is small, however as an exploratory survey, these organizations are indicative of the types of companies that have been identified by the Organizational Leadership and Supervision department (OLS) as companies who have hired engineering technology graduates in the past. The interviews include qualitative questions, with the interviewer asking specific questions to each individual, and allowing the interviewee to answer and provide any additional information that he or she believes is important and relative to the topic. The limitations of the interviews will be determined partially by the number of companies that grants interviews. The major limitation will depend on the interviewees’ ability to provide valid information to the researcher. The purpose of the interviews is to determine if the expectations that are held by employers for newly hired graduates are consistent with the current engineering technology curriculum at IUPUI.

Participant 1- AIT Laboratories. In the last calendar year, this organization has hired top graduates from engineering technology programs at IUPUI. Since the company has experienced extreme growth in recent years, they must continually grow their management team. Having hired recent graduates, this organization is able to make recommendations for continued improvement of the program and curriculum.

Participant 2- Sallie Mae. As the leader in the financial services market, this organization has insight into current trends in post-secondary education. The individual interviewed by the researcher also has participated in classroom activities at IUPUI, and has hired engineering technology graduates into the organization.

Participant 3- Simon Property Group. This organization hires recent engineering technology graduates in large numbers (the last group was approximately 30 positions). The exposure that the company has to a variety of undergraduate students is significant; thus, this organization is able to speak to the employability of graduates across the nation.

Participant 4- City Government (Indianapolis, Indiana). City government agencies hire engineering technology graduates for jobs in technical areas, project management, and supervisory positions. The interviewee from the Department of Public Works has a background in human resources for the city, as well as experience in supervision.

Participant 5- Society for Human Resource Management. This professional organization works with companies across the nation, and presently has over 225,000 members. The Vice President for Workforce Readiness participated in this research; thus, this person is well-informed on the needs and demands of organizations across all sectors in the area of graduate skills.
Participant 6- Indiana Blood Center (IBC). A large non-profit organization, regulated by the FDA and the European Union (as products are shipped there), also follows good manufacturing practices. This employer hires engineering technology graduates for positions in entry-level supervision, technology, manufacturing, quality control, and distribution.

Research Questions

- As a manager in what areas would you like to see improvement in the overall knowledge, skills and abilities of newly hired college graduates?
- In what areas of knowledge, skills and abilities do you find that newly hired college graduates excel?
- In what areas of professional development, (e.g. Interview capabilities, business etiquette etc) do recent graduates lack proficiency?
- In what areas of professional development, (e.g. Interview capabilities, business etiquette etc), do recent graduates excel?
- What types of classes or experiences should be added to college curriculum to better prepare entry-level supervisors/employees?
- How do you wish you had been better prepared as an entry level employee?
- Beyond academic learning, what additional skills would like to see in entry-level supervisory positions?
- Would you describe your training and orientation process for new hires?
- What baseline expectations do you have of new hires?
- Any other comments regarding employability of recent college-graduates?

Research Tool Testing

Survey questions were tested with the management team of a large bank in Indianapolis, Indiana. Feedback from the pilot test provided clarification and enhancement to the final research questions.

Data Analysis

This information will be analyzed and reviewed to see what areas of the current engineering technology curriculum, if any, need to be adjusted. It is expected that varied answers will be gained, but that a definite concentration of responses that focus on communication skills as the most needed skill set. This was the case in nearly all of the material gathered for the literature review, however the material given in the literature dealt with studies that are now several years old. The data gathered in the literature review dealt mostly with technical types of fields, while the information that this research focuses on supervisory, project management, and related positions.

Data Presentation

Analysis of Question 1—As a manager in what areas would you like to see improvements in the overall knowledge, skills, and abilities of newly hired college graduates?
Respondents were able to give any answer to question one. The interviewees were not given access to answers previously given by others; therefore it is significant that many interviewees responded with the same answers. Table 1 demonstrates the breakdown of every answer.

The following answers were given more than once: Real world experience or internships, formal written business communications, ability to supplement theories learned with applicable skills, mock interview experience, and all verbal communication. These responses can be classified into two categories, communication skills, and applicable experience. All respondents answered at least once in one or both of these categories.

Question 2- In what areas of knowledge, skills and abilities do you find that newly hired graduates excel?

Four out of the six interviewees responded that today’s graduates are extremely competent when dealing with current technology, and “book knowledge”. As seen in table 2, interviewees also
responded positively to graduate’s ability in the areas of individual thinking, teamwork, ability to self start/motivate, and informal communication skills (e.g. email).

Question 3- In what areas of professional development, (Interview capabilities, business etiquettes etc) do recent graduates excel?

Three of the six respondents expressed concern in recent graduate’s ability to interview effectively. Comments from interviewees on this topic were lack of ability to “sell oneself as a candidate of choice”, and lack of “thorough research of the company interviewing for”. In this realm, professionals showed concern in the professional conduct of recent graduates. As seen in Table 3, other responses were varied, but demonstrate a range of areas in which today’s managers and professionals would like to see improvement. Gaps in public speaking, networking and resume development were noted.

Question 4- In what areas of professional development to recent graduates excel? Responses were extremely scattered. Only two participants used the same words to express the areas in which they are impressed with today’s in graduates. Those areas were in resume development, and self-promotion (eye-contact and handshakes). One interviewee specifically noted that some graduates excel in developing resumes, stating that the resumes that he/she has seen from this campus are among the best received.

Question 5- What types of classes or experiences should be added to college curriculum to better prepare entry-level supervisors/employees?
Four of six interviewees stated that internships should be a required part of undergraduate’s experience. These four individuals find that graduates who have participated in internship programs are much better prepared for the work environment. The other two respondents did not use the term internships, however one did reply that role-playing, case studies, and ability to conduct interviews as the interviewer, would be a benefit to the skill set of new graduates. The last respondent finds that overall sales, finance and business education would be helpful.

Question 6- How do you wish you had been better prepared as an entry level employee?

One respondent stated that he/she did not begin at an entry-level position; instead went directly to management at the age of 19 due to speaking Spanish fluently. Of the remaining five respondents, four stated that they would have benefited from having a mentor, to assist them in navigating not only their educational career, but to help understand the organizational climate of the company they began their professional career in.

Three of the five interviewees that responded to this question, felt that being required to complete an internship prior to college graduation would have helped them. Internships would have provided insight into corporate politics and help in working in many organizational cultures.
Question 7- Beyond academic learning what additional skills would you like to see in entry-level supervisory positions? The responses to this question were varied, possibly due to the fact that interviewees were responding with what skills are necessary in their field, which differs greatly. However, there were three responses that were mentioned by two interviewees. Working with people, resolving conflict, and having real world experience were given as skills that need to be honed in addition to academic learning.

Question 9- What baseline expectations do you have of new hires?

Again these answers greatly depend on the sector and field of the interviewees. However, three of the six respondents stated that a strong ethical foundation, good computer skills, and the ability to back up educational qualifications are expected. Two professionals find that good customer service and self-motivation is very important.

**Implications**

**Curriculum**

Whereas there is overwhelming evidence from each of the employers that soft skills rank higher than specific technical skills for professions requiring a foundation in leadership, this research is also fully supported in the literature. Previous studies indicated that “non-technical skills are
rated even higher than technical skills” and for the areas of communication mentioned by five of the six participants in this study, additional research concluded that “the intensity of writing standards as well as public speaking, interviewing skills, and business etiquette should be increased in an undergraduate curriculum.1,5,”

While technological/book knowledge information and competency is an integral part of the undergraduate process, academics “are only one key element of success.” All participants in this study agree that graduates must meet the credentials and capabilities that correspond with the position hired for, reconfirming what other researchers agree that “graduates need to have more job related experience, communication and teamwork skills1,2.

Professional and Career Resources

All participants in this study express desire to see a higher level of professionalism and business skills. One participant indicated interest in developing boards and discussion forums to assist the collegiate community in assessing and having open communication to discuss with students the opportunities to increase graduate employability. This method is similar to the developments in England, in which they used professional panels to communicate with the faculty to improve the undergraduate curriculum10.

Students should be encouraged to use the existing resources, such as career centers to better prepare themselves for the rigorous demands of the professional functions of interviews, resume development, and networking. Instruction on, “building portfolios that provide representation of the skills and traits employers value”, will not only build skill sets, but also demonstrate willingness to understand the behaviors that employers prefer to see in candidates applying for their positions11.

Real-World Experience

The knowledge, skills, and abilities that are developed in “real-world” experiences are often transferable to other fields. These opportunities provide students with the chance to work with other people, develop teamwork abilities, and professional presentation abilities. Four of the six of the individuals interviewed would like to see internships be made a required part of the undergraduate experience, which reiterates research which states, “graduates need to have more job-related experience, communication and teamwork skills2,6,7.”

Three participants of this research even stated that they would have greatly benefited from required internships or similar experiences. Such requirements would have provided insight into topics such as corporate politics and experience in organizational cultures that can not be taught in the classroom, aren’t “task completion” skills, and can move between companies7.

Recommendations

Recommendations for Students
• Take advantage of internships, cooperative education, experiential learning, and any other form of co-curricular activities that can enhance knowledge, skills, and experiences desired by employers particularly in the realm of communication.

• Use on- and off-campus resources (e.g. career centers; faculty advisors; alumni networks) to assist in career preparation activities, such as mock interviews, informational interviews, business etiquette preparation, professional networking, resume preparation, etc.

• Wisely use class projects and activities, especially those require group/team endeavors, to sharpen both the technical/course related learning and the interpersonal skills that increasingly team-oriented workplaces require.

Recommendations for Faculty

• Structure assignments, activities, and projects that are truly representative of the “real world” dynamics of tight and firm deadlines, professional presentation of work, interdependent work processes (e.g. team activities).

• Invite business/industry professionals to serve as juries of student work, especially higher-level, capstone, and/or project work that students must complete to demonstrate a mastery of college-level learning.

• Use alumni, business/industry, and community resources to assist students in networking and professional development endeavors.

Recommendations for Administrators

• Actively reach out to alumni, business/industry, and community stakeholders to recruit, retain, and engage them in the life of the university, especially as it relates to providing realistic previews to students about the world of work.

• Reward faculty who promote positive business relationships in their teaching and learning efforts.

• Recognize the tangible and intangible benefits of having students well-prepared to “hit the ground running” in the workplace.

Recommendations for Employers

• Be willing to serve on university panels, boards, and other initiatives to provide students with a realistic preview of the workplace.

• Partner with faculty to conduct joint teaching, research, or service projects that can encourage relevance in the college curriculum and can involve students in constructing their own knowledge.
• Make use of internships, cooperative education, and other experiential learning opportunities (e.g. field trips; site visits) to help students see the value of how their learning can be applied in the real world.

• Reward students and programs, in the form of scholarships and philanthropic endeavors, to encourage research and teaching that yield positive economic development for the organization and its surrounding community.

Recommendations for Policymakers

• Encourage accreditation to continue to place a premium on applied, experiential learning as part of a well-rounded university experience.

• Promote the use of internships, cooperative education, and experiential learning as hallmarks of a well-prepared college student.

• Allocate seed money or other resources to foster initial collaborations between business/industry and higher education.

Recommendations for Policy, Practice, Improvement, and Future Research

Consistency vs. flexibility

The goals of the collegiate academic curriculum are two-fold. Each degree conferred must be the result of a consistent set of requirements that have been met over the course of the student’s academic career. However, many of today’s collegiate campuses strive to provide a measure of flexibility, in an effort to meet not only the scheduling needs of students, but also to allow a variety of academic courses to be included in the curriculum.

Academic philosophy vs. “real world” perspectives

This research focused on identifying the areas that the professional world would like to see improvement in the education of undergraduate students. A continuation of this research would look at the current thought patterns of the faculty of our universities in an attempt to find the disparities between academic philosophy and the professionals in the “real world”. Then everyone must recognize ideological gaps must be overcome for the best interest of the students and faculty.

Classroom learning vs. applied learning

A complete undergraduate experience includes a variety of classes, and activities. Certain fundamental topics must be covered in the classroom environment; however other equally necessary components are best learned through applying the skills to real situations. It is extremely important that policies are designed to enhance both of these vital realms.

Assumptions vs. expectations
No room exists for miscommunication or misunderstanding in any area of the collegiate experience. The student population, the academic instructors, nor employers can maintain assumptions or unvoiced expectations if the system is to function productively. For example, the professional world expects a certain level of business etiquette from a newly hired college graduate. In many situations, the professors at the university level do not always anticipate that things such as professional dress are something to be covered in a class. It is assumed that students know these things, but upon examination it is not clear who bears the responsibility for educating such behaviors.

**Conclusion**

As today’s job market becomes increasingly competitive, also crucial is earning a degree that actually adds value and significance. Research suggests that there are gaps in the education received by recent college graduates. By interviewing those who currently hire entry-level supervisory employees, this research will identified where the engineering technology undergraduate curriculum may need enhancements.

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