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DISSERTATION

**AN ANALYSIS OF PERCEPTIONS OF AN INTERNSHIP EXPERIENCE
OF COLLEGE GRADUATES IN ABET ACCREDITED OCCUPATIONAL
SAFETY AND HEALTH PROGRAMS**

Submitted by

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In partial fulfillment of the requirements

for the Degree of Doctor of Philosophy

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Fall 2002

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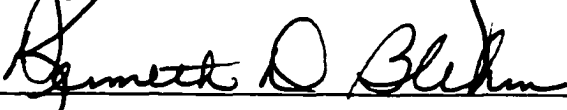
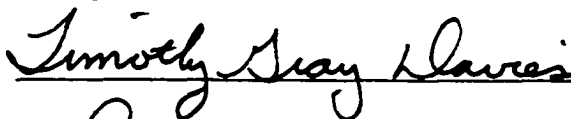
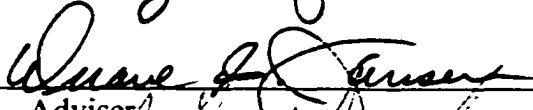
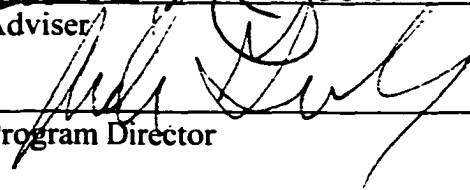
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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY CHARLES WALLACE MCGLOTHLIN, JR. ENTITLED "AN ANALYSIS OF PERCEPTIONS OF AN INTERNSHIP EXPERIENCE OF COLLEGE GRADUATES IN ABET ACCREDITED OCCUPATIONAL SAFETY AND HEALTH PROGRAMS" BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work





Adviser

Program Director

ABSTRACT OF DISSERTATION
AN ANALYSIS OF PERCEPTIONS OF AN INTERNSHIP EXPERIENCE
OF COLLEGE GRADUATES IN ABET ACCREDITED OCCUPATIONAL
SAFETY AND HEALTH PROGRAMS

The purpose of this study was to assess the degree to which the occupational safety and health internship experience provided personal, professional, and career value for occupational safety and health graduates of ABET accredited degree programs; determine those characteristics that contribute most to a worthwhile internship experience for occupational safety and health graduates; ascertain the extent to which occupational safety and health graduates were satisfied with the accomplishments of specific characteristics that were related to the internship experience; and determine those demographic and internship characteristics that contribute most to the overall satisfaction of an internship experience for occupational safety and health graduates.

An internship survey questionnaire was mailed to all 1997 through 2001 bachelor's and master's degree graduates of five ABET accredited university programs in occupational safety and health who completed at least one internship experience. The research study population was typically a 25.13 year old, white, single male who completed his first internship while receiving a bachelor's degree. The typical internship sites were manufacturing, other sites (university, pulp and paper, trucking, utilities, and health care), and government agencies with two-thirds of the interns having responsibility

as safety generalists. The geographical locations of the internship sites were evenly distributed over urban, rural, and suburban areas.

Each of the 18 key attributes of the internship experience was considered by the respondents to be somewhat to very important to the value of and satisfaction with the internship experience. The ten internship attributes which received the highest levels of perceived importance were learning skills from experience, interacting with management, gaining confidence in technical skills, obtaining career related experience for resume'-building, receiving on-site orientation, applying academic knowledge and skills to real situations, having a well-defined job description, performing challenging work assignments, working cooperatively with others, and using and developing basic skills. Eight of the ten most important internship attributes were also among the ten highest ranked internship attributes in satisfaction with the internship experience. Two of the ten most important internship attributes received low mean satisfaction level scores, receiving on-site orientation and having a well-defined job description.

Significant positive correlations were found between interns' salary and the value of and satisfaction with the internship experience. Analysis of variance on the value of and satisfaction with the internship indicated that significant differences did exist between the various internship sites. Based on the results of this study, recommendations were made to improve occupational safety and health internship programs and for needed future research.

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DEDICATION

This dissertation is dedicated to the women in my life:

To Mary Virginia McGlothlin, my mother and first teacher. Her repeated reading of that haunting story, *The Little Engine that Could*, and her daily prayers have been instrumental in my completing this study and in every other success in my life.

To Dairdre Susan McGlothlin, my wonderful wife of 34 years. She has been by my side and supported me in this undertaking and in every other significant undertaking in our married life, and before.

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CHAPTER I

INTRODUCTION

Problem Statement and Context

Moving into the 21st century, forward thinking scholars have suggested a new paradigm for higher education. This new model emphasizes developing interdependent collaborations with employers--industries, businesses, public organizations, and organized labor groups--to move toward excellence in higher education. For many colleges, such an undertaking will represent a fundamental shift in the way they see the institution's role in the community. Organizational boundaries will become less well-defined and interdependence of groups working toward common goals will intensify, requiring an increased level of flexibility and trust. Many colleges and universities are beginning to recognize this interdependency and are starting to focus on opportunities for synergistic relationships (Baker, 1992; Childers, McKenney, & Wilson, 1998; Finn, 1997; Freeland, Marini, & Weighart, 1998; Hall, 1999; Itin, 1999; National Safety Council, 2001a; National Commission for Cooperative Education, 2002a; Wilson, Stull & Vinsonhaler, 1996).

According to Freeland et al. (1998) "The beginning of the 21st century represents an era of unprecedented opportunities and challenges for co-op institutions in the United States" (p.17). Social, economic, and historic forces are making cooperative education more relevant than ever. The most exciting aspect of this situation is the new emphasis

of cooperation among universities, industry, and government, as these institutions break down barriers and forge new alliances that will benefit student, industry, society, and the economy (Freeland et al., 1998). Cooperation between universities and private and public sector employers can be achieved through various types of cooperative education programs. Internships are a prime example of higher education and employers working together to provide a high-quality cooperative educational experience to college students.

The concept of integrating work and learning is regaining a favorable position with many colleges and universities (Baker, 1992; Finn, 1997; Itin, 1999; National Safety Council, 2001b). Students have increasingly demanded practical application of the skills that they are learning during their post secondary education. This situation has led to a growing number of colleges and universities that are willing to incorporate off-campus learning experiences as a means of satisfying the needs of students as well as providing broadened educational opportunities (Finn, 1997). However, moving into the new millennium, American industry is undergoing rapid change. Increasing competition from foreign companies, a strong desire by U.S. companies to go global, downsize or rightsize, a desire for continuous improvement, and computer information technology in American industry have made change the norm, rather than the exception (Gardner, 1996; John, Doherty, & Nichols, 1998).

According to Gardner (1996), many students are gaining the content or basic skills required to perform work tasks; but, many lack the interactive or context skills which lead to success in the workplace. Struggling with the chaotic context of work is an essential element of the student's educational experience. "Educational institutions are doing far too little in structuring educational experiences that allow students to practice

applying what they have learned and reflection on the consequences of their applications” (Gardner, 1996, p. 54). Cooperative education must be responsive to the changes taking place in American industry. Faculty, class materials, and even methods of delivery must be relevant and in line with industrial practices. Although this is a challenge for colleges and universities offering cooperative educational experiences, according to John et al. (1998) the advantages to students are obvious as they graduate with an understanding of their job, the industrial world, and have gained maturity from their work experience.

Given the evidence documented in repeated studies that attest to the value of cooperative education to student satisfaction and academic/job placement success, it is ironic that higher education institutional support is waning (Dubick, McNerney & Potts, 1996). “The irony in this is the apparent inverse relationship between decreasing institutional support and increasing perceived need” (p. 74). According to Hall (1999), the dramatic changes in the structure of the work place will challenge assumptions about cooperative education and require change by the university to provide a new cooperative educational experience:

What seems inescapable is that “cooperative education,” by whatever new name, will be of increasing, not decreasing, importance in the twenty-first century. Students will still require the basic intellectual tools that are most efficiently gained through rigorous, linear academic study. But they will enter a job market that is fluid and rapidly changing. They will need to experience a wide variety of work situations, preparing them for different and frequently changing jobs. They will need to learn to work flexibly, with kaleidoscopically moving teams of workers. They will need to learn adaptability to different situations, varied timed time frames, and changing groups of people. (p. 14)

The occupational safety and health profession is maturing today just as the fields of medicine, engineering, and related health professions have in the past. The growth accompanying this maturity necessitates better preparation of college graduates entering

the profession (NSC, 2001a). One method of achieving this advanced preparation is the professional internship. This involves a student apprenticeship under the direction of an in-service professional. However, these experiences must be planned and conducted in such a manner that they can be conducive to the professional development of the student (Wilson, 1997).

Although a number of studies have been conducted dealing with cooperative education/internships, few studies have dealt specifically with student or recent graduate perceptions of their on-site internship experience (Bartkus & Stull, 1997; Stull, Crow, & Braunstein, 1997; Wilson, 1997). Complaints concerning the lack of research in cooperative education are frequent (Bartkus & Stull, 1997; Kerka, 1989; Stull, et al., 1997; Wilson, 1988). When Stull et al. (1997) conducted a previous five-year review of research articles in the *Journal of Cooperative Education* their results were “lackluster at best,” and they found only ten articles which listed specific recommendations for further research. Wilson (1997) conducted a similar review of research reported in the *Journal of Cooperative Education* since 1985. He found a total of 60 research articles in the *Journal*. Of that total, only 16 reports related to students, or recent graduates, perception of the value or satisfaction relative to their internship experience.

Most of the research reported in the *Journal of Cooperative Education* over the last ten years detailed differences (or non-differences) between cooperative education participants and their non-co-op counterparts (Wilson, 1997). When the null hypotheses were accepted, suggesting no difference between the two groups on the variables under consideration, the researchers went to some length to explain what may be responsible for the results. Seldom has as much attention been given to explanations of the positive

results of the cooperative learning experience: “Thus, while the numbers of studies showing positive results have increased, providing a growing body of supportive literature for cooperative education, explanations have not. Our notions why co-op works have not kept pace with the data showing that it does” (Wilson, 1997, p. 21).

In the researcher’s review of the *Journal of Cooperative Education* from 1992 to the present, only four articles were found that dealt with student/recent graduate perceptions of their internship experience. In addition, the search in *Dissertations Abstracts* discovered only two dissertations since 1992 that dealt with college graduate perceptions of value and satisfaction associated with occupational safety and health-related degree programs. The first was a 1992 study conducted by David G. Kraemer at Murray State University analyzing the value and satisfaction associated with the occupational safety and health program at that university. The second study, conducted by Robert D. Soule, was designed to assess the curriculum strengths and weakness of the safety sciences degree program at Indiana University of Pennsylvania.

The Soule (1993) study identified the occupational safety and health internship program as one of the strengths of the occupational safety program curriculum but did not evaluate the internship experience in any other way. This study did not address the program graduates’ perceptions of the value of the internship experience as it may have provided personal, professional, or career development, nor did the study identify any of the characteristics that may have contributed to respondents’ satisfaction with the internship experience as was done in the earlier Kraemer study (1992). However, both of these universities were offering safety-related bachelor’s and master’s degrees accredited by ABET, the Accreditation Board for Engineering and Technology, Inc. ABET is a

federation of 31 professional engineering and technical societies. Since 1932, ABET has provided quality assurance of education through their accreditation process. ABET is recognized by the Council on Higher Education Accreditation and accredits some 2300 engineering, engineering technology, and applied science programs at over 500 colleges and universities nationally (ABET, 2002).

No longer should cooperative education be treated as an educational methodology that is universally the same. According to Wilson (1997) “we must begin to examine systematically program characteristics and their relationship to outcomes and we must begin to experiment with different kinds of deliberate intervention” (p. 23). This is the type of assessment process that must be applied to provide evidence necessary for ABET accreditation of occupational safety and health degree programs under the new ABET outcomes-based accreditation standards (ABET, 2001).

Graduate perceptions of the value and key characteristics of an effective internship experience, studied in this research, can be an important part of the ABET 2001 accreditation process. Student perceptions are only one method to assess learning; however, these perceptions are an important factor that ABET review teams take into consideration as they make accreditation decisions (Canale, Cates, & Duwart, 2000). An assessment of the recent graduate perceptions of the internship experience may also provide information needed in developing or revising internship programs at colleges and universities with ABET accredited occupational safety and health degree programs.

Recent research studies at Northeastern University and the University of Cincinnati (Canale, Cates, & Duwart, 2000) were directed at identifying student perceptions of where in the curriculum the identified ABET learning outcomes, necessary

for ABET accreditation, are accomplished—classroom, previous learning, or experiential learning. These studies are documenting that the majority of the ABET learning outcomes are accomplished through the students' cooperative learning experience. However, these studies do not address the characteristics of the cooperative educational experience that contribute most to student learning.

Purpose Statement

The current research study will complement the findings by Northeastern University and the University of Cincinnati. However, the current study is directed at determining student perceptions of their experiential learning through an internship as it provides personal, professional, and career value. In addition, this study will identify the specific components or characteristics of the occupational safety and health internship experience that contribute most to student satisfaction and learning. The findings and recommendations of this study may contribute significantly to improving the internship learning experience and provide ABET accredited programs in occupational safety and health with support in their ongoing accreditation process. Other colleges or universities considering ABET accreditation of safety-related programs under the new ABET outcomes-based criteria should also benefit significantly from the results of this research.

More specifically, the purpose of this study is to assess the degree to which the occupational safety and health internship experience provided personal, professional, and career value for occupational safety and health graduates; determine those characteristics that contribute most to a worthwhile internship experience for occupational safety and health graduates; ascertain the extent to which occupational safety and health graduates were satisfied with the accomplishments of specific characteristics that were related to

the internship experience; and determine those demographic and internship characteristics that contribute most to the overall satisfaction of an internship experience for occupational safety and health graduates.

This study will replicate research on the perceptions of the internship experience of Murray State University occupational safety and health graduates done in 1992 by David G. Kraemer and will expand that research per the recommendations for future research made by Kraemer (1992). Recommendations made by Kraemer addressed in this research study include the following:

- 1. Use a larger population of occupational safety and health interns to allow for the generalization of future study results.**
- 2. Conduct similar studies at the same and different universities who have Accreditation Board for Engineering and Technology (ABET) accredited occupational safety and health programs.**
- 3. Conduct research on past and future occupational safety and health interns to allow for comparisons to determine if changes in perception of the internship experience occurred as a result of curriculum and preparation changes.**
- 4. Revise the Internship Survey Questionnaire based on the finding of the Kraemer study.**
- 5. Conduct qualitative studies with occupational safety and health interns to assess strengths and weaknesses of the internship program.**

Research Questions

The following research questions serve to provide direction and will be addressed in this study:

1. **What is the demographic profile of students participating in an ABET accredited internship program as determined by the internship survey questionnaire for graduates?**
2. **What is the perceived degree to which the occupational safety and health internship experience provided personal value as determined by the internship survey questionnaire for graduates?**
3. **What is the perceived degree to which the occupational safety and health internship experience provided professional value as determined by the internship survey questionnaire for graduates?**
4. **What is the perceived degree to which the occupational safety and health internship experience provided career value as determined by the internship survey questionnaire for graduates?**
5. **What is the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?**
6. **What is the perceived level of importance placed on selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?**
7. **What is the perceived level of satisfaction with selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?**

8. Is there a difference between female and male students' perception of the importance of the internship experience as determined by the internship survey questionnaire for graduates?
9. Is there a difference between male and female students in regard to internship salary, bachelor's degree grade point average, and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?
10. Is there a difference between students' internship primary duties and the internship site location and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates as determined by the internship survey questionnaire for graduates?
11. Is there a difference between internship site industry or a relationship between the number of employees at the internship site and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?
12. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts personal, professional, and career value of the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?

13. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts the perceived degree of satisfaction with the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?
14. What are the major sources of value and satisfaction, or dissatisfaction, from the internship experience as determined by the internship survey questionnaire for graduates?

Research Design

The 14 research questions will be addressed using an ex post facto (non-experimental) survey questionnaire research design. The questionnaire will be analyzed primarily in the quantitative paradigm using descriptive, comparative, and associative research approaches to answer the 13 quantitative research questions, and constant comparative analysis will be used to address the one qualitative research question.

The survey questionnaire consists of 62 quantitative questions developed as a means of gathering demographic and internship data and responses of perceptions relative to the occupational safety and health internship experience. A Likert-type rating scale is used to indicate the intensity with which the respondents agree or disagree with statements contained in the survey questionnaire. The survey is also designed to collect qualitative data along with the demographic and quantitative data. Five open-ended questions on the survey questionnaire allow the participant to address issues relative to the value and key characteristics of the internship experience that may not be reflected in the quantitative areas of the questionnaire. This combined quantitative and qualitative

approach should provide better understanding in the analysis of perceptions of the values and satisfactions associated with the occupational safety and health internship experience.

Descriptive statistics will be used to analyze the general univariate pattern of the data. Descriptive statistics to include frequencies, percentages, ranges, means, and standard deviations will be calculated to analyze the demographic and internship information questions. The Pearson product moment correlation coefficient will be used to measure the strength and direction of relationship between variables. Analysis of variance (ANOVA) and Fisher LSD post hoc test will be used to examine differences between the independent variables and mean satisfaction and mean value scores. Multiple linear regression will be used to determine the relationship between the various predictor and criterion variables. Open-ended questions with associated narrative responses will be analyzed in the qualitative research domain using constant comparative analysis.

Definitions of Terms

The following terms are defined to assist in understanding this research:

Attribute – To ascribe as a quality or characteristic; a characteristic or quality of a person or thing (Neufeldt, 1997). Throughout this study, attribute is used to ascribe a characteristic or quality of the occupational safety and health internship experience.

Attribute independent variable – An independent variable is any predictor, antecedent, or presumed cause or influence under investigation in a research study. Attributes of the participants, as well as active independent variables fit this definition. An attribute independent variable is a class of variable that cannot be given or controlled during the study. The values of this independent variable are an attribute of the person.

For example, gender, age, ethnic group, or disability are attributes of a person (Gliner & Morgan, 2000).

Cooperative education – A structured educational strategy integrating classroom studies with learning through productive work experiences in a field related to a student's academic or career goals. It provides progressive experiences integrating theory and practice (NCCE, n.d.c). In an alternation cooperative education program, the students alternate periods of full-time attendance in academic classes with periods of full-time employment in positions usually secured by the institution and approved for educational value. In parallel cooperative education programs, the students attend classes full-time for a segment of the day and work part-time for another segment of the day at a position secured and approved by the institution (NCCE, n.d.c).

Dependent/criterion variable - The outcome or criterion variable. This variable is assumed to measure or assess the effect of the attribute independent variable (Gliner & Morgan, 2000).

Experiential education/learning – Learning activities that engage the learner directly in the phenomena being studied – an essential part of a complete learning cycle (National Society for Experiential Education, 2001). The terms *experiential education* and *experiential learning* are used interchangeably throughout this research study.

Internship – There are no hard and fast distinctions between *internships* and *cooperative education*. The differences tend to be ones of statistical frequency. Internships are most often single experiences not exceeding a single term or capstone experiences within the curriculum. In contrast, most cooperative education experiences involve multiple terms and begin much earlier in the student's curriculum (Wilson,

1987). More specifically, an *internship* is any carefully monitored work or service experience in which an individual has intentional learning goals and reflects actively on what s/he is learning throughout the experience (NSEE, 2001).

Occupational safety – Field of activity in the prevention of all types of accidents in the related work environments and situations (ASSE, 2001).

Occupational health – Concerned with the physical, mental, and social well-being of people in relation to their jobs and working environment. The concern is thus wider than the safety of the workplace and includes health and job satisfaction (ASSE, 2001).

Safety – The control of recognized hazards to attain an acceptable level of risk (NSC, 2001b).

Satisfaction – Anything that brings gratification, pleasure, or contentment (Neufeldt, 1997).

Value – That quality of a thing according to which it is thought of as being more or less desirable, useful, estimable, important, etc.; worth or the degree of worth (Neufeldt, 1997).

Delimitations

The following boundaries are anticipated when interpreting results from this study:

1. Data collection, analysis, and inferences made were obtained through the responses of recent graduates on a self-reported survey questionnaire.
2. Participants taking the internship survey questionnaire were limited to bachelor's and master's degree graduates who have completed an internship

experience in an occupational safety and health, ABET accredited, degree program.

3. Data were collected on the basis of a past internship experience.

Limitations and Assumptions

For the purpose of this study, the following limitations are recognized along with the assumptions made:

1. Participants responded honestly and to the best of their knowledge to items on the internship survey questionnaire form.
2. Participants in this study understood how to fill out the survey questionnaire properly, given the appropriate directions.
3. Participants in the study were not coerced to participate. Recent occupational safety and health graduates, 1997-2001, from ABET accredited university programs participated in this study.
4. Participants in this study may or may not be representative of occupational safety and health graduates at non-ABET degree programs who have completed an internship experience, thus limiting the ability to generalize the findings.
5. Participation in this study was voluntary and the data gathered depended upon the particular respondents who chose to participate.
6. The study did not control for or measure all variables that might influence the criterion scores of the subjects.

7. Summed criterion scores may not reflect significant differences in quality of the occupational safety and health internship experience at the various universities involved in this study.
8. The internship survey questionnaire instrument developed for this investigation measured the selected variables accurately.
9. The demographic data and internship information form developed for this investigation provided accurate descriptive data to develop a composite picture of the population.

Significance of the Study

Currently, there are excellent career opportunities for students who are involved with internship programs. Business and industry are now placing emphasis on education and training of the workforce for a new millennium. Partnerships between institutions of higher education and both public and private sector employers abound. These highly interdependent collaborations will likely move education to a new level of excellence (Baker, 1992; Childers et al., 1998; Finn, 1997; Freeland et al., 1998; Hall, 1999; NSC, 2001a; Equinoa & Shibata, 1998; Wilson et al., 1996). However, quality assurance must be maintained within cooperative education work experiences and other non-traditional learning experiences so that credibility with accrediting bodies, like ABET, is upheld (ABET, 2001; Keeton, 1978; NCCE, 1999).

Research shows that many internship/cooperative work experience programs are effective (Premont, 1998). However, it is not merely being physically present at a work site that leads to a meaningful and satisfactory work experience (Canale & Duwart, 1999; Greenberger & Steinberg, 1981; Northeastern University, n.d.; Page, Geck, & Wiseman,

1999). There is a need to identify the elements of an internship experience that contribute most to student learning. Programs that provide internship experiences need to know what job site characteristics to look for, plan for, and monitor (Kraemer, 1992; Wilson, 1997).

Although numerous studies have been conducted dealing with internship and experiential education (Bartkus & Stull, 1997; Stull et al., 1997; Wilson, 1997), few studies have dealt specifically with graduate perceptions of their internship experience (Page et al., 1999). The research study at Murray State University provides a good basis for continued study and understanding of those perceptions. This study will fill the gaps in the Murray State study and allow for generalization of the new findings per the recommendations for future research identified by Kraemer (1992). The findings of this study should allow universities, and partner employers, to improve the internship as a valuable learning experience in the 21st century.

Page et al. (1999) surveyed 1,080 co-op/internship coordinators in a comprehensive and systematic effort to determine co-op/internship site characteristics that ensure high quality experiential learning. This study resulted in a set of guidelines for a quality internship site learning experience. The authors recognized the need for future research to ascertain a more comprehensive set of quality guidelines based on site supervisors and student perceptions of the key factors or characteristics that result in a high quality co-op/internship site learning experience. According to Girard (1999), a primary reason for measuring perceptions is to gain an understanding of the students' awareness of situations, which can aid in the design and implementation of effective internship programs.

An assessment of graduate perceptions of the internship experience may also provide information needed in developing or revising internship programs at colleges and universities with ABET accredited occupational safety and health degree programs. Student perception of the experiential learning component of their ABET accredited education is an essential part of the ongoing ABET accreditation process and may provide universities with support basis for accreditation of an internship program (Canale et al., 2000).

Although the current research findings may be particularly helpful to the occupational safety and health profession, they may also serve as a framework for examining perceptions of internship experiences for the health education professions, as well as other career and technical education fields (Kraemer, 1992). Stull et al. (1997) conducted a study to identify and evaluate needed areas of research in higher education cooperative programs. These authors found that practitioners and administrators in cooperative education seemed to be “most interested in research to support student and learning outcomes” (Stull et al., 1997, p. 34).

Learning outcomes of today’s educational experience are the focus of both public and private sector educational stakeholders. Ongoing survey research of the student/recent graduate perceptions of the value of and satisfaction with their educational experiences will play an important role in the assessment of an outcomes-based educational experience.

Summary

In this chapter, the context, need, and purpose for this research study were described. Research questions were posed and a research design to address these

questions was introduced. This design included an overview of methodology and instrumentation required to carryout the study. Key terms used in the study were defined, and delimitations, limitations and assumptions for the study were discussed.

Chapter II contains a review of literature, which provides the basis for the research study undertaken and shows its importance to the internship experience for occupational safety and health students. Chapter III describes the research methods used in conducting the study. Chapter IV contains the findings for each of the research questions under study, and Chapter V includes a summary of the research study along with conclusions and recommendations.

CHAPTER II

REVIEW OF LITERATURE

This chapter contains a review of the literature that provided a background for the focus of the research study discussed in Chapter I. The literature review included primary and secondary sources by educational philosophers, leaders, and practitioners in the field of experiential learning from the early 1900s through today.

Scope of Literature Review

The literature cited in this chapter was identified primarily through a search of the electronic databases, print media, interlibrary loan resources, and web-based information searches available through the Colorado State University Libraries. Various combinations of the following key words were used for database and web-based searches: cooperative education, cooperative learning, co-op, experiential education, experiential learning, intern, internship(s), practicum, higher education, postsecondary education, occupational education, career education, and career development. Records were identified through the various journal databases, online journals, Dissertation Abstracts Database, ERIC Database, OCLC FirstSearch System, National Library of Education, and the ProQuest online information service.

Since this dissertation will replicate the Kraemer dissertation done in 1992, the literature review focused on review of key citations in the Kraemer study and primary sources since 1992 with an emphasis on the last five years, 1997-2001. However, several

key cooperative education/internship research articles and two landmark studies are cited from the 1960s through the 1980s.

Need for a Literature Review

This study will bridge the gap in the cooperative educational literature between the 1992 Kraemer study and the present. Although the Kraemer study was an important documentation of values of the internship experience in the occupational safety and health career field, the current evaluation of these occupational safety and health internship learning experiences fall under a new, outcomes-based criteria for Accreditation Board for Engineering and Technology (ABET) accredited degree programs. The Murray State University program that Kraemer studied is an example of such an ABET accredited program that is affected by the new ABET accreditation criteria. This literature review will focus on the perceived personal, professional, and career value of the cooperative education/internship experience, student satisfaction with the internship experience, characteristics necessary for a successful internship, and connecting the student perception of learning outcomes of the internship experience to the newly-established ABET 2001 outcomes-based accreditation criteria.

Organization of the Review

Looking at occupational safety and health as the development of a relatively new career field, this literature review will identify key events in the evolution of this career path. Next, a brief background of the development of experiential education, and specifically internships, is discussed. The background and development of experiential education is followed by a look at the values and benefits of the internship experience. With these benefits in mind, current research efforts into determining key characteristics

of a successful internship experience will be discussed. The Murray State University study findings by Kraemer will then be discussed along with more current research findings at Northeastern University and the University of Cincinnati as these studies relate to established ABET outcomes-based accreditation criteria. Last, the literature will be summarized and conclusions and implications will be presented.

The literature review which relates to perceptions of the internship experience of occupational safety and health graduates is divided into seven sections: the evolution of a career field, a brief history of experiential education (internship/cooperative education), the benefits of internship/cooperative education programs, a review of research in internships/cooperative education, the Murray State University Study, the future: outcomes-based accreditation, and a summary, conclusions, and implications of the literature review.

The Evolution of a Career Field

A brief review of the history of the occupational safety and health movement in the United States and how that movement has resulted in the development of a relatively new career field is necessary to appreciate the education and training efforts that have evolved to support this emerging new career field. This historic perspective, coupled with future projections of trends in the occupational safety and health career field, will help justify the need for this study into the experiential learning component of the occupational safety and health educational process.

The Occupational Safety and Health Movement

Until the late 1700s, worldwide production efforts were very labor-intensive, with work done by hand in a cottage environment. According to the National Safety Council

(2001a), three developments changed this way of life in the late 1700s: development of the spinning jenny in England in 1764; invention of the power loom which was perfected in 1784; and development of the cotton gin in America in 1792. These and other innovations ushered in the Industrial Revolution in England in the 18th century. This revolution reached the United States about a hundred years later in the last half of the 19th century. The Industrial Revolution significantly changed the way Americans would live and work in the future. Specifically, these innovations in the industrial production process included substitution of mechanical energy for animal sources of power, substitution of machines for human skills and strength, invention of new methods to transform raw materials into finished goods, and organization of work into large units, factories and mills, which made possible efficient division of labor (NSC, 2001a).

These changes in the American lifestyle came with a heavy price. According to the National Safety Council (2001a),

Unfortunately, these changes in production methods with their need for masses of workers also created hazards never before encountered. These conditions greatly affected the history of occupational safety and health. Many health workers and industrial experts recognized the increasing need for hazard control. (p. 5)

However, very little was done to address these newly recognized hazards. Revolution was taking place in the workplace, but the thinking of the public, management, and public law still reflected the past when the worker was an independent craftsman or a member of a family-owned business.

Employers still relied on common law defenses from England that gave the injured worker little chance of compensation for his work-related injury. The three common law doctrines that favored the employer were (a) the fellow servant rule which said that the employer was not liable for injury to an employee that resulted from

negligence of a fellow employee; (b) contributory negligence that said the employer was not liable if the employee was injured due to his own negligence; and (c) assumption of risk that said the employer was not liable because the employee took the job with full knowledge of the risks and hazards involved (NSC, 2001a).

By the end of the 19th century, American factories were producing at previously unimagined rates but clearly at the expense of human values, health, and safety. The 1900 census paints a grim picture of life in America at that time. The census showed 1,750,178 children between the ages of 10 and 15 years were working in America's mines, factories, mills, and other industrial settings. According to the National Safety Council (2001a)

Some 25,000 were employed in mines and quarries; 12,000 in making chewing tobacco and cigars; 12,000 in sawmills; 5,000 at or near steam-driven planers and lathes; 7,000 in laundries; 2,000 in bakeries; and 138,000 as servants and waiters in hotels and restaurants. These children often worked 12 to 14 hours a day; there were no health or safety guidelines in effect, even for children under age 10. (p. 6)

One of the most significant events in the occupational safety and health movement occurred in 1906 when the Pittsburgh Survey took place. This survey was the first attempt to detail and pinpoint the serious nature of occupational accidents and deaths. Allegheny County in Pennsylvania was selected as a typical industrialized area for this study. Over the one-year survey period a "death calendar" of the county indicated that nearly two deaths occurred each day throughout that year. In addition, thousands of crippling injuries occurred in the reporting period. If this was the case in one county, people asked, what must the situation for the entire country? The Pittsburgh Survey made it very clear that accident and death was a serious problem and gave the safety movement a much-needed boost (NSC, 2001a).

Similar studies were conducted in other industrial centers with similar ugly results relative to industrial accidents and poor occupational health conditions. Individuals along with public and private sector organizations raised their voices to protest these unacceptable working conditions. As cited by the National Safety Council (2001a), in late 1906, Judge Elbert Gary, president of the United States Steel Corporation wrote a very strong policy statement for this major American corporation:

The United States Steel Corporation expects its subsidiary companies to make every effort practicable to prevent injury to its employees. Expenditures necessary for such purposes will be authorized. Nothing which will add to the protection of the workmen should be neglected. (p. 7)

The Association of Iron and Steel Electrical Engineers organized soon after this announcement and devoted considerable attention to safety issues. Two years later, in 1908, President Theodore Roosevelt stated: “The number of accidents which result in the death or crippling of wage earners is simply appalling. In a very few years it runs up a total far in excess of the aggregate of the dead in any major war” (NSC, 2001a, p. 6). Roosevelt’s social legislation passed that year in Congress and established the first workers’ compensation law for federal employees. New York was the first state to pass a bill for workers’ compensation in 1910, but it was declared unconstitutional by the New York Court of Appeals. Several other state attempts at workers’ compensation meet with similar results until the United States Supreme Court declared workers’ compensation to be constitutional in 1916 (NSC, 2001a). After this ruling, many states moved forward with workers’ compensation legislation.

The safety movement in the United States continued to gain momentum after the above historic events. Both the National Safety Council and the American Society of Safety Engineers were formed in the early 1900s. In 1920 the National Safety Code

Program was developed and later became the American National Standards Institute (ANSI). This group addressed the “materials” aspect of safety while the National Safety Council focused on the “people” portion of accident and occupational illness prevention (NSC, 2001a). The first generally accepted occupational safety and health reference book, H.W. Heinrich’s *Industrial Accident Prevention*, was published in 1931, and by the end of the decade ANSI had developed many additional industrial safety standards (Kraemer, 1992). The American Industrial Hygiene Association was established in 1939 with the purpose to enhance the identification, analysis, and management of workplace environmental stresses (NSC, 2001a). All of these efforts led to a significant reduction in the frequency rate of accidents between 1930 and 1940 (Ferry, 1985).

The next major boost to the safety movement in America occurred during World War II when the federal government began encouraging its contractors to adopt safe work practices. Industry expanded to meet the needs of the war and additional safety personnel were trained to keep pace with the new risks and hazards in the workplace. This new acceptance of safety activities as a part of the industrial setting did not diminish with the end of the war. The importance of safety to quality production has been well established (NSC, 2001a). The National Safety Council (2001a) went on to state that the two most significant events that are impacting health and safety issues today, to include educational issues, are the Occupational Safety and Health Act of 1970 and the Federal Mine Safety and Health Act of 1977. These Acts are intended to ensure, so far as possible, safe and healthful working conditions for all American workers.

The Occupational Safety and Health Act of 1970

Kraemer (1992) stated that with the passage of the Occupational Safety and Health Act of 1970, for the first time in history the United States had a comprehensive national safety law. This act passed because more and more people had become concerned about safety and health problems in the workplace. According to Kraemer (1992)

Without the continuous demand for less hazardous working conditions by organized labor, the advent of modern day OSHA rules, regulations and standards could not have been achieved. Labor pressures, accentuated by disasters in the workplace, have been the driving force behind all types of safety and health issues. (p. 30)

Labor's demand for a single comprehensive federal safety and health act was answered with the 1970 passage of the Williams-Steiger Occupational Safety and Health Act, which became effective on April 28, 1971 (Grimaldi & Simonds, 1989; Hammer & Price, 2001; Occupational Safety and Health Administration, 2000). The Occupational Safety and Health Act was the result of growing recognition on the part of Congress that industrial accidents and health hazards were taking a heavy toll on the American worker and the nation's commerce. More than 90 million Americans spent their days on the job, yet until 1970, no uniform and comprehensive provisions existed for their protection against workplace safety and health hazards. In considering the need for a comprehensive safety and health act, Congress was presented with a number of shocking statistics in the late nineteen sixties. The Occupational Safety and Health Administration (OSHA, 2000) revealed the following:

1. An estimated 14,500 people were killed annually in industrial accidents.
2. At the very least, 2.5 million workers were disabled on the job each year.

3. New incidences of occupational diseases numbered over 300,000 each year. The human suffering and individual, company, and national economic consequences of these industrial accidents and illnesses were overwhelming.

According to OSHA (2000), the Occupational Safety and Health Act has the fundamental purpose to ensure that, so far as possible, every working man and woman in the nation safe and healthful working conditions and to preserve our human resources. OSHA (2000) goes on to explain that this fundamental purpose of the Occupational Safety and Health Act can be accomplished through achievement of the Act's objectives:

1. Encourage employers and employees to reduce workplace hazards and to develop new or improve existing safety and health programs;
2. Develop mandatory safety and health standards and to enforce them effectively;
3. Provide research in occupational safety and health it deal effectively with existing and new safety problems;
4. Establish training programs to increase the number and competence of safety personnel;
5. Monitor job-related injuries through record keeping and reporting;
6. Provide separate rights and responsibilities to employers and employees with respect to achieving safe and healthful working conditions;
7. Explore ways to discover latent diseases and establish a link between disease and environment working conditions; and
8. Develop, evaluate, and approve more state occupational safety and health programs.

Although most Americans think the Occupational Safety and Health Act's purpose was solely to develop and enforce safety and health regulations, this was only one of the eight stated objectives of this act. The objectives relative to providing research and to establishing training programs to increase the number of competent safety personnel are routinely carried out by the ABET accredited programs in occupational safety and health offered at the universities participating in this study (Kraemer, 1992). All of these university programs were developed since the enactment of the Occupational Safety and Health Act of 1970, in part, to respond the training and educational needs identified in this Act. In addition, the act also established the National Institute for Occupational Safety and Health (NIOSH) under what is now the U.S. Department of Health and Human Services. According to the Occupational Safety and Health Act, NIOSH has five primary functions, outlined as follows by Hammer and Price (2001) and the National Safety Council (2001a):

1. Conduct research and demonstrations of the health effects of exposures in the workplace;
2. Develop and establish recommended occupational safety and health standards;
3. Develop criteria for dealing with toxic materials and harmful agents;
4. Train an adequate supply of qualified personnel to carry out the purposes of the act; and
5. Conduct research and assistance programs for improving the protection and maintenance of worker health.

NIOSH also relies, in part, on Training Project Grants awarded to ABET accredited occupational safety and health programs to carry out their training responsibilities under the Occupational Safety and Health Act of 1970 (Kraemer, 1992; Soule, 1993).

Unfortunately, the passage of this Occupational Safety and Health Act, with all of its educational and training support, did not eliminate the problems of injuries and illnesses to the nation's workforce as organized labor had hoped. Shrinking budgets, political in-fighting, and bureaucratic delays have all been a factor in this lack of success (Hammer & Price, 2001). In the years since the passage of the Act, the Department of Labor, workers, and management have realized that they must take an active role in resolving safety and health issues and in developing a comprehensive approach to workplace safety and health. All of these stakeholders now realize that the Occupational Safety and Health Administration regulations are only one piece of a comprehensive effort that is required to providing a safe and healthful workplace free from recognizable hazards. The U.S. Department of Labor continues to work at reforming the Occupational Safety and Health Act to correct this deficiency and expand the scope of the Act (Hammer & Price, 2001; NSC, 2001a; OSHA, 2000).

In spite of its shortcomings, the Occupational Safety and Health Act of 1970 has contributed significantly to the development of occupational safety and health as a career field. In addition, the act has contributed to the increasing importance of the safety and health professional. Many progressive companies began to realize that the safety and health of their workforce was simply good business. According to Kraemer (1992), "In order for industry to be profitable and efficient, management had to realize that the safety and health professional was an integral part of the organization" (p. 33). Kraemer (1992)

went on to recognize that training of the safety professional in the past was mainly on-the-job training, where today employers increasingly demand formal, professional education and training as the regulations and work conditions become more complex. As a result, it is clear that there is a need for comprehensive undergraduate and graduate safety programs (ASSE & BCSP, 2000; Kraemer, 1992; Soule, 1993). The National Safety Council (2001b) agreed and supported these earlier finding relative to the need for college trained safety and health professionals as will be discussed in more detail under the Future Trends section to follow.

Occupational Safety and Health Degree Programs

According to the American Society of Safety Engineers and the Board of Certified Safety Professionals (ASSE & BCSP, 2000), approximately 65 two-year and four-year colleges and universities offer an occupational safety or health-related degree program. These degrees range from the two-year associate degree through the bachelor's, master's, and Ph.D. degree levels. Currently there are only five universities that offer ABET accredited bachelor and or master degree programs in occupational safety and health. These universities are Indiana University of Pennsylvania, Marshall University, Millersville University, Murray State University, and West Virginia University. The curriculum standards for ABET accreditation of the various levels of occupational safety and health degree programs were developed by ASSE. Therefore the curriculum outlines at each of these universities is similar and is found in Appendix G. As part of the curriculum, ABET does require an experiential learning component in both the bachelor's and master's degree programs for those programs to be accredited (ABET, 2001).

Each of the above listed ABET accredited programs is currently accredited under the specific curriculum ABET standard. However, that standard for ABET accreditation is in process of changing. Effective 2002, all ABET renewal and new accreditation will be on an outcomes-based criteria. This outcomes-based criteria was developed by ASSE for the ABET accreditation process (ABET, 2001). This new accreditation standard will also be applied to the experiential learning component of these curricula. Currently, all of the above listed ABET accredited programs are using internships to satisfy the required experiential learning component of their occupational safety and health curriculum. The current study has the potential to effectively demonstrate learning outcomes of the internship experience to satisfy the ABET outcomes-based accreditation standard in addition to establishing the characteristics that most effectively contribute to value and student satisfaction of the internship experience. All five universities with ABET accredited occupational safety and health programs have agreed to participate in this study.

Future Trends

According to the American Society of Safety Engineers in cooperation with the Board of Certified Safety Professionals, during the last 20 years, employment in the safety and health profession has grown dramatically (ASSE & BCSP, 2000). This growth was in spite of corporate downsizing in that same period of time: "Safety has also become more complex, so that today's safety professionals must have better qualifications. Safety demands the best in all of its practitioners" (ASSE & BCSP, 2000, p. 1). The primary focus of the safety professional is the prevention of harm to people, property, and the environment. The safety professional must apply principles from the

disciplines of engineering, education, psychology, physiology, enforcement, industrial hygiene, health, physics, and management. In addition, these professionals must use appropriate methods and techniques of loss prevention and loss control to prevent accidents, illnesses, fires, explosions, and other events which harm people, property, and the environment (ASSE & BCSP, 2000).

The United States has much to gain by reducing the number of the above preventable events. The National Safety Council (2001b) estimated that accidents alone cost our nation over \$480.5 billion in 1998. Fire-related losses exceed \$8 billion per year. In addition, exposure to harmful biological, physical, and chemical agents produce great losses each year, but accurate estimates of their impact are hard to establish. Pollution of all kinds causes damage to all forms of life and threatens the future habitability of our planet. Past pollution has generated huge cleanup costs that our country must bear to ensure a safe and healthy environment for the future. Safety and health professionals are the specialists in the fight to prevent or control these hazards (NSC, 2001b).

According to the ASSE and the BCSP, to be called a safety professional an individual must acquire the essential knowledge of safety sciences through formal education at accredited colleges and universities and couple that education with actual field experience so that others can rely on their judgments and recommendations to control identified hazards (ASSE & BCSP, 2000). Having recognized that the ABET accredited programs in occupational safety and health offer the highest level of academic preparation for the safety practitioner, BCSP awards extra credit for these degrees toward

meeting the prerequisite qualifications to take the Certified Safety Professional examination (BCSP, 2001).

Since the passage of the Occupational Safety and Health Act of 1970, legislators have increased the scope of safety practice into areas of environmental protection, product safety, hazardous materials management, and design of safety into vehicles, highways, processing plants, and more. With this increased emphasis on safety driven by laws, public concern, and company values, more colleges today prepare people for careers in safety and health. According to the ASSE and the BCSP (2000), the number of people preparing themselves for careers in the safety and health profession through safety degree programs is increasing: “As a result, the safety profession has respect from other established professions such as engineering, medicine and law” (p. 20).

Although safety and health degree programs are relatively young compared to these long established professional programs, safety and health programs are maturing and gaining recognition and respect through ABET accreditation. The ASSE and the BCSP (2000) recognize that engineering, medicine, and law professions have traditionally been involved in hazard control, but have not had special training in loss prevention and hazard control required of today’s safety professional. The current college curricula of ABET accredited programs in occupational safety and health have incorporated the experiential learning components that have long been an important part of engineering, medicine, and other career/professional education programs.

As the occupational safety and health career field matures, the employment opportunities continue to grow. The National Safety Council (2001a) projects expanding employment opportunities in safety management, safety engineering, industrial hygiene,

occupational medicine, the safety departments of international and local labor unions, on the staffs of trade associations, in safety consulting, and in government service.

However, the National Safety Council also recognizes that although the advanced education courses and programs for safety professionals increased dramatically in the 1980s, the number could not keep pace with the expanding need: “The result was a serious shortage of highly-qualified safety professionals” (National Safety Council, 2001a, p. 24).

This shortfall had two effects on safety and health positions in both the public and private sectors: increased competition for senior safety positions and increased demand for advanced safety training beyond that offered by two-year technical colleges. The National Safety Council (2001a), the American Society of Safety Engineers, and the Board of Certified Safety Professionals (ASSE & BCSP, 2000) have all recognized one of the challenges of tomorrow as being the need for the safety profession to obtain individuals with the education necessary to compete and work effectively in the safety and health career field. This challenge can best be met by the colleges and universities offering ABET accredited degrees in occupational safety and health. However, as with any emerging career field, forward thinking safety practitioners and educators realize that a successful safety and health career starts with a firm academic foundation, but requires a lifelong commitment to learning (LaBar, 1995).

Brief History of Experiential Education

John Dewey had the greatest influence upon educational thought and practice in America. One of his central beliefs was that people learn from experience and from

doing. His philosophy of pragmatism was more a philosophy of method and strategy than one of content and substance (Wilson, 1987).

Cooperative education is a particular expression of educational pragmatism. Its advocates believe, like the pragmatists, that education is not an end in itself. Rather, it is a means to some other goal or purpose. For Dewey, the purpose and function of education was to help prepare students for effective and satisfying citizenship. In like fashion, the proponents of cooperative education provide students with work experience to help students achieve important learning which will contribute to their effective citizenship (Wilson, 1987).

The first educational institution to incorporate experiential education was the Rensselaer Polytechnic Institute in 1824. Experiential learning provided students with first hand experience through field trips to factories and coal mines. With the growth of new professions in agriculture, architecture, engineering, and forestry, universities were expected to provide both practical as well as theoretical education (Stanton, 1982).

The passage of the Morrill Act in 1862 provided for the establishment of land grant universities and established the first national mandate for the systematic application of knowledge. This Act required each state to have agricultural and mechanical arts programs that were to be shared with farmers (Stanton, 1982). As land grant universities evolved, natural sciences came into more prominence in curriculum. Field work became an integral part of the land grant student's curriculum. Students were required to participate in actual work experiences and to apply experiential learning to classroom theories. This type of professional education has evolved into the traditional cooperative education/internship experience (Chickering, 1977).

At the University of Cincinnati in 1906, Herman Schneider, Dean of Engineering, inaugurated cooperative education--the combination of work and study as an integrated part of the education process. Dean Schneider developed his cooperative education philosophy and believed that if college students could spend a portion of time working in industry, applying the knowledge and theory gained in school to practical work situation, their education would become much more meaningful. To accomplish his plan, Schneider devised a scheme of dividing students into two sections. One section of students worked while the other section attended classes. After a specified period of time the two sections of students changed roles (University of Cincinnati, 2002).

According to Wilson and Lyons (1961), Dean Schneider's concept of cooperative education "can rightfully be called a revolution because it embodied a new concept in curriculum planning and organization which has flourished" (p.1). Schneider's cooperative education plan met the needs of students who wanted practical experience and additional income to continue their education. His plan was also consistent with the movement in higher education to less isolation of academia and more involvement in society (Stanton, 1982).

In 1909, cooperative engineering courses were started in Boston at what was to become Northeastern University. The first non-engineering cooperative program was started at the University of Cincinnati in 1919, and Antioch College was the first liberal arts education program to incorporate cooperative education (Wilson, 1987).

Cooperative education programs continued to grow through World War I and the great depression (Hall, 1999; Hartley, 1987; Wilson, 1987; Barbeau, 1985).

World War II had a dramatic effect on cooperative education. Many colleges and universities had to suspend these programs as a result of the wartime demands. However, the 1960's saw an acceleration of progress in experiential learning because of changes in technology and long-held educational beliefs. Since the 1960's, a tremendous expansion has occurred in experiential education programs. According to the Cooperative Education Research Center at Northeastern University, there are currently over 1,000 public and private colleges and universities with cooperative education programs. Approximately 250,000 interns are employed in these programs (National Commission for Cooperative Education, 2002b).

Internships have become an important instructional methodology and are being widely used in many educational disciplines (Premont, 1998). This review of the literature explores internships as an instructional method in an academic setting. The advantages and limitations are analyzed from the viewpoint of the intern, the sponsoring employer, and the academic supervisor. The findings of this review of the literature are the basis for continuing research needed to develop specific recommendations for an effective internship program from the viewpoint of the intern, the sponsoring employer, and the academic institution.

Background and Rationale

Recognizing both the expansion and extension of cooperative education along with the fact that higher education was facing many new challenges, Charles F. Kettering suggested and arranged to sponsor a conference on Cooperative Education and the Impending Educational Crisis. In 1957, this first national conference on cooperative education was held in Dayton, Ohio and was attended by representatives of over eighty

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colleges and universities and by representatives of nearly one hundred firms employing co-op students. The purpose of the conference was to look at existing working models of cooperative education to serve effectively the enlarging student population who will seek advanced education in the future (Wilson & Lyons, 1961).

The conference revealed that cooperative education had been adapted to a variety of forms of higher education degree programs. There were also many kinds of businesses, industries, and professions involved with cooperative education. However, the conference attendees recognized the need for an objective comparison of cooperative education with conventional education. As a result of this conference, a major research study was funded for a study of cooperative education programs at the college level.

The Study of Cooperative Education was the first comprehensive study and has become a seminal work in cooperative education research as reported by Wilson and Lyons (1961). The committee conducting this study reached the following conclusions about cooperative education: (a) This way of educating college students has several important values; (b) To obtain these values, cooperative education programs must overcome certain common problems to offer a successful co-op program; and (c) The recommendations for the extension and development of these coordinated work and study programs must be followed to ensure success.

The committee's judgments can be summarized as follows: "Cooperative education has important values for colleges and universities, for students and employers. These values should be given wide publicity and cooperative programs in American higher education should be greatly extended" (Wilson & Lyons, 1961, p.14). The finding

of this important study have provided the basis for much of the current research into cooperative education.

Because of new and emerging technologies, the university campus is slowly undergoing change and becoming less a place and more a nexus for teaching and learning. Fortunately, cooperative education has always embraced the notion that the campus was not the requisite and only place for learning (Hall, 1999). Quality education requires both information assimilation and experiential learning. The strengths and weaknesses of these two types of learning are mutually complementary with the strengths of experiential learning compensating for the weaknesses of information assimilation and vice versa (Little, 1981).

According to the National Society for Experiential Education (2001), an internship is any carefully-monitored work or service experience in which an individual has intentional learning goals and reflects actively on what he or she is learning throughout the experience. Internships have long been required in professional fields such as medicine, social work, and engineering. However, today internships are increasingly being recognized as necessary for students entering many other career and technical fields of employment. The National Commission for Cooperative Education (2002a) estimated that one in five college students do an internship during any academic year.

Research has shown that many internship programs are effective. However, it is not merely being physically present at a work site that leads to a meaningful and satisfactory work experience (Canale & Duwart, 1999; Greenberger & Steinberg, 1981; NCCE, 2002c; Page, Geck, & Wiseman, 1999). There is need to identify the elements of

a work experience that enhance student learning. Occupational safety and health programs that provide internship experiences need to know what job site characteristics to look for, plan for, and monitor (Kraemer, 1992).

Kraemer's 1992 study provided information on research findings relative to the characteristics that can affect educational practice in administrating effective internship programs. The level of satisfaction and the level of personal, professional and career value of the internship experience of bachelor's and master's degree graduates of the occupational safety and health program at Murray State University was discussed. Eighteen characteristics were investigated in Kraemer's study to determine how important they are to a worthwhile internship program. All 18 internship characteristics had 80 percent or more of the respondents indicating that the characteristics were at least somewhat important. The top six rated characteristics were considered most important and will be discussed in this review.

Internship: The Effective Transition

The last two decades have seen a considerable expansion of internship/- cooperative education programs into many public and private colleges and universities (Premont, 1998). There are several factors that have contributed to this change. One major impetus has been student demand. Students have various motives for experiencing off-campus educational opportunities (Canale & Duwart, 1999; Page et al., 1999). Many occupational safety and health students are concerned about post-graduation employment and internships have become increasingly important in the area of job placement (Kraemer, 1992).

Randle and Smith (1988) stated that students today say their number one reason for going to college is to get a good job, whereas, 15 years ago it was to discover their philosophy of life. In addition, Randle and Smith concluded that the internship allows the student to explore the occupational safety career field and to gain valuable real-world experience to complement their academic studies. The American Council on Education (1996) reported the results of a survey of 500 colleges and universities on cooperative education, internships, and paid work-based learning. Key findings reported that 72 percent of colleges said their students were more career oriented than they were ten years ago, and 47 percent said their graduates had more trouble finding good employment after graduation than they had a decade ago. The ACE report (1996) goes on to note that in colleges and universities with paid, work-based learning programs (including co-op and paid internships), the most impact was reported on placement success for graduates, financial help for students, and academic gains for students.

According to Kraemer (1992), the extension of classroom study to practice in a profession adds a unique dimension to the student's preparation for entering a career. These educational experiences take place in businesses, industries, research organizations, educational institutions, and governmental agencies located throughout the United States and abroad. Work-integrated learning assignments assist students in developing an understanding of human relationships involved in the work setting. Kraemer (1992) believed that the professional internship experience for students desiring to become professionals in the field of occupational safety and health is vital. These experiences can be planned and conducted in such a manner that they can be conducive to the growth of the student while contributing to the success of the company.

Kraemer (1992) further reported that, over the years, educators have discovered the educational and developmental benefits that result when students combine the theory taught in the classroom with real life work experiences. According to Cates and Jones (1999), the most important benefit from linking cooperative education with academics is that we optimize student learning. When academic components of cooperative education are linked with the application of leaning theories they strengthen the co-op program and maximize learning outcomes (Cates & Jones, 1999).

According to Page, Riggion, and Kubiak (1995), the overarching goal of cooperative education is to bridge the gap between the world of the classroom and the world of work. The primary academic goals of cooperative education are to interface theory with practice and gain new insight about theory through application, and the secondary goals are to provide arrangement so students can develop both professional and interpersonal skills, make business contacts for the future, and receive opportunities for financial assistance while learning (Page et al, 1995).

As reported by Ferguson (1998), the ABET required occupational safety and health internship experience is the practical work experience that enables the student to apply classroom theory within a real-world work setting--“it is a means of bridging the gap between the student’s education and the business world” (p. 22). The Education Commission of the States (ECS, 1996) espoused that the changing workplace has brought about the need to give all learners an opportunity to apply knowledge, work in teams, and to see learning and skill development as a lifelong process. These same concepts are clearly reflected in the new ABET 2001 outcomes-base criteria for accreditation of safety-related degree programs (ABET, 2001).

Internships at Murray State University

The Murray State University Department of Occupational Safety and Health offers comprehensive degree programs at the bachelor's and master's degree levels. The Department was established in 1978 and is part of the College of Industry and Technology. Both the Bachelor of Science and the Master of Science degrees in occupational safety and health are accredited by ABET (Murray State University Department of Occupational Safety and Health, 2002b).

The bachelor's degree program is designed to provide the technical and professional knowledge required by individuals pursuing professional careers in accident prevention, loss-control management and supervision, and inspection and control of occupational hazards, industrial hygiene, or environmental health and safety (Murray State University Undergraduate Bulletin, 2001-2003). The specific course of study leading to the Bachelor of Science degree in Occupational Safety and Health is found at <http://www.murraystate.edu/cit/osh/oshbsdegree.htm>. The graduate program in Occupational Safety and Health at the master degree level is designed to provide the philosophical, scientific and technical knowledge required of individuals seeking professional management and administrative positions in the field of occupational safety and health (Murray State University Graduate Bulletin, 2000-2002). The prerequisites and the courses of study for this Master of Science degree are found at <http://www.murraystate.edu/cit/osh/oshmsdegree.htm>.

The Murray State occupational safety and health internship program was initiated and developed by Dr. Marvin Mills in 1980. The program is designed to provide qualified students with real-world experience in the career field of occupational safety

and health. The extension of classroom training through practice in the profession prepares the student for entering their career area. This experiential learning is accomplished through assignments that require the application and demonstration of knowledge, attitudes, judgment, and techniques taught in the classroom (Kraemer (1992). The length of the work experience under the internship program is approximately three to four months and is limited to one semester or one summer term. A minimum of four hundred hours of actual work experience is required (Murray State University Department of Occupational Safety and Health, 2002a).

The extension of classroom study to practice in a profession adds a unique dimension in the student's preparation to enter the occupational safety and health career field. Work-integrated learning assignments assist the intern in developing an understanding of human relationships involved in the workplace (Murray State University Department of Occupational Safety and Health, 2002a).

Professional work experience makes the Murray State student more valuable to an employer and increases qualifications for a more responsible career opportunity. The primary focus of work-integrated/internship learning is to acquire relevant professional experience involving current and emerging technologies. A secondary benefit is that a student has the opportunity to earn both academic credit and wages while learning through the work experience. In the 2001/2002 academic school year, Murray State placed 94 students in internship/co-op positions with 65 different companies in more than 20 states and one foreign country (D.C. Kraemer, personal communication, April 29, 2002).

Students typically take internships and cooperative learning positions as juniors, seniors, and graduate students after completing a strong core of career-related classes. Occupational safety and health students at Murray State may earn as many as nine credit hours toward graduation through work-integrated learning (Murray State University Department of Occupational Safety and Health, 2002a).

Benefits of Internships

According to the National Commission of Cooperative Education (2002b), hundreds of colleges have found cooperative education valuable for enhancing the curriculum, attracting and retaining enrollment, and educating students who succeed after college--whether in graduate school or directly in their chosen career path. Hunt (1987) noted that the student, employer, and school must cooperate to make the internship program successful, which then benefits everyone involved. It is important to recognize the relationships among the principals and realize that there are equal responsibilities, rights and benefits for everyone. Students, educators, and employers have long recognized the benefits of internships to students (Hunt 1987, Kerka 1989, NCCE 2002b).

Surveys such as the American Council on Education's *Campus Trends 1996* (ACE, 1996), demonstrate the high interest students have in an educational curriculum which gives them an edge in becoming effective, productive, and successful members of society. In this ACE report, colleges with co-op programs cited three main benefits for students: academic gains, jobs after graduation, and financial help. The report also cited institutional gains, student retention, course improvement, and partnerships with business.

The National Commission for Cooperative Education (NCCE, 2002b), the National Society for Experiential Education (2001), the Center for Internships and Cooperative Education (2002), and many of the authors cited in this review of literature all outline the benefits of the cooperative education experience to the various stakeholders, however, the National Commission for Cooperative Education (2002b) has documented the most comprehensive list of benefits to employers, institutions of higher education, society in general, and to student interns.

Employer Benefits

Employers find college cooperative education programs a vital resource for human resource management. Large and small companies, as well as public sector and nonprofit organizations, have found these programs invaluable for meeting short-term employment needs and building a cost-effective, productive system of recruiting future graduates (NCCE, 2002b).

The National Commission for Cooperative Education (2002b) identified two primary reasons for employers to become involved in internship programs. First, interns bring enthusiasm and fresh ideas to the working environment, and they can fill temporary positions. Second, employers often screen interns for potential full-time employment. The National Commission for Cooperative Education also reported that according to its statistics, 40 to 45 percent of co-op students are offered full-time positions by their co-op employer after they graduate. In 2002 the National Commission for Cooperative Education documented the following benefits of cooperative education to the employer (NCCE, 2002b):

1. Provides an excellent source of well-prepared employees;

2. **Increases cost-effectiveness of recruitment and training. Research shows that employers save money by using co-op to identify and train personnel;**
3. **Improves personnel selection process by using actual on-the-job performance as a basis for permanent hiring decisions;**
4. **Enhances company relations with colleges and the college students. Through evaluations, advisory committees, and other means;**
5. **Improves workforce diversity through access to and by minority students for permanent employment;**
6. **Increases retention rates among permanent employees recruited and hired through a co-op program. Both students and employers have time to try out the position and ensure a good fit for both; and**
7. **Enhances human resource flexibility by providing effective short-term employees.**

Institutional Benefits

According to the National Commission for Cooperative Education (2002b), many values and benefits are available to the institution of higher learning through internships/cooperative education programs. The college or university stays current with the ever-changing needs of business and industry, which is essential to update curricula to keep courses relevant to the current job requirements. With relevant academic courses coupled with experiential learning opportunities, the school is able to attract students' interest in a high quality educational experience in occupational safety and health.

The National Commission for Cooperative Education outlined the following benefits of cooperative education to institutions of higher education (2002b):

1. Expands the range of educational opportunities for students by integrating learning at work into the academic program;
2. Assists in the recruitment and retention of students;
3. Improves student and faculty access to state-of-the-art equipment and technology by using the workplace as a lab extension of the classroom;
4. Keeps college curricula up-to-date with industry needs;
5. Builds a strong relationship between the institution and the local business community;
6. Enhances public support for higher education by improving the post-graduate career opportunities for students;
7. Satisfies employers increasingly request demonstrated outcomes of students; and
8. Enhances the quality and level of employment for graduates.

Societal Benefits

The National Commission for Cooperative Education (2002b) has identified educational, financial, career, and human resource benefits for our society from cooperative education programs as follows:

1. Provides financial resources for college to students from all income levels which is very important to low and middle-income families;
2. Increases the effectiveness and relevance of a college education by relating classroom study to the world of work;
3. Fosters respect for work and increases the level of personal responsibility;

4. Builds a globally-competitive workforce necessary for success in the future;
and
5. Saves federal money by providing employer-paid wages to help finance college expenses.

Student Benefits

According to John, Doherty, and Nichols (1998), the advantages of cooperative education are obvious: “Students graduate with an understanding of their job, and understanding of the industrial world, and maturity gained from experience” (p. 10).

The National Commission for Cooperative Education (2002b) identified the following student benefits of internships:

1. Enhances classroom learning by integrating academic curriculum with real-world work experience;
2. Confirms or redirects career decision-making through on-the-job experience in a given career field;
3. Enhances affordability of college through employer-paid wages;
4. Provides a means of financial aid available to all student, regardless of family income or other financial aid arrangements;
5. Improves job opportunities after graduation by giving students valuable work experience and contact with potential employers;
6. Teaches valuable job-search skills such as career assessment, resume'-writing, and interviewing skills; and

7. Encourages completion of college for all students from top performers to traditionally non-college bound students by linking school to work and providing necessary funding to make college accessible.

The benefits of the cooperative education/internship experience outlined above for the employer, institution of higher education, our society, and the student intern are very similar to the benefits identified in the early work done by Wilson and Lyons (1961) and some of the more recent findings in the ERIC digest (Kerka, 1989). Considering the theoretical potential benefits of cooperative education, the economic challenges facing our nation, and the current emphasis on school-business partnerships, efforts should be undertaken to increase the effectiveness and the impact of cooperative education in the future (Bragg & Hamm, 1995; Finn, 1997; Freeland et al., 1998; Gardner, 1996; Hall, 1999; Itin, 1999; John et al., 1998; Kerka, 1989; Childers, McKenney, & Wilson, 1998; NCCE, 2002b; Apostolides & Looye, 1997; Cates & Jones, 1999; Wilson et al., 1996).

Research in Internship/Cooperative Education

At the 20th Annual Conference of the Cooperative Education Association, Wilson, Homer, and Stull (1985) discussed three major reasons why internship/cooperative education personnel needed to become involved in research. The first reason is that these individuals need a systematic method of identifying and analyzing problems to make sound decisions. This type of research will provide for improvements in the internship/cooperative education programs rather than simply reacting to undesirable situations. The second reason internship/cooperative education personnel need to conduct research is that they will learn basic research techniques and procedures which will help them interpret research studies conducted by others. Third, it is important to

conduct research to be accepted as legitimate by the higher education community. This is an important political point of view because of the value placed on research productivity (Wilson et al., 1985).

Although research in internship/cooperative education is important, making use of this information in planning and decision making is just as important (Wilson, 1988). Research findings must be interpreted and communicated before they can affect educational practice. Without this dissemination, neither research nor advocacy can bring about permanent change in cooperative education (Kraemer, 1992).

Brief History of Research

Wilson (1988) conducted a comprehensive review of the research in cooperative education and noted the vital role research has played in the evolution of cooperative education. Although cooperative education began at the University of Cincinnati in 1906, it was not until 1961 that the first comprehensive national evaluation of cooperative education was completed. This Study of Cooperative Education was conducted under the general auspices of the Thomas Alva Edison Foundation and was formally inaugurated on July 1, 1958 (Wilson & Lyons, 1961). This is a seminal work with its findings, recommendations, and conclusions serving as the basis for much of today's body of knowledge on cooperative education/internships.

Over a two-year period of time from 1958 to 1960, Wilson and Lyons obtained information on the advantages and disadvantages of the cooperative education experience from students, graduates, faculty, practitioners, and the existing body of literature. The findings of this study gave positive testimony to the values of cooperative education as an

educational strategy of considerable merit. The study concluded that cooperative education provides the following important educational elements:

- 1. By coordinating work experience with the campus education program, theory and practice are more closely related and find greater meaning in their studies;**
- 2. This coordination of work and study increases student motivation by connecting jobs with campus learning, greater interest in academic work develops;**
- 3. Work experience contributes to a greater sense of responsibility and self-dependence resulting in student maturity;**
- 4. Most students develop greater understanding of other people and skills in human relations;**
- 5. Cooperative education helps markedly to orient college students to the world of work;**
- 6. Cooperative education has an important value in making higher education possible and attractive to many young people who would not otherwise go to college since earnings of students while on the job have enabled many to attend college who could not finance their education without it; and**
- 7. Faculty are better able to keep in touch with business, industry, and some of the professions and gain information through these contacts for planning the curriculum and teaching resulting in greater educational vitality; and**
- 8. Because cooperative education is commonly organized so that half the student body is at work while the other half is on the campus, the plan permits more**

efficient utilization of the college plant and other facilities (Wilson & Lyons, 1961).

In addition to these eight clear-cut educational values, Wilson and Lyons (1961) also noted several other advantages that are possible through cooperative education. A number of business and industrial firms find cooperative education programs a means of maintaining a flow of trained personnel. It also provides a means for attracting promising young people and serves as an actual testing ground for employers. For students, cooperative education programs furnish contacts useful in later job placement, and for many it gives them a head start in salary and position as they graduate from college and go into full-time employment. For most married women, the work experience was greatly valued because they developed understanding of and initial skills in an occupational area and have greater confidence they can return to work when their children no longer need their attention. Finally, the researchers noted that a number of colleges found cooperative education provided greater community recognition and support for the colleges (Wilson & Lyons, 1961).

Although a number of research studies have been conducted dealing with cooperative education/internships, few studies have dealt specifically with student or recent graduate perceptions of their on-site internship experience (Bartkus & Stull, 1997; Stull et al., 1997; Wilson, 1997). According to Wilson (1988), complaints concerning the lack of research in cooperative education are frequent. Wilson (1988) reported that more than 113 articles have been published in the *Journal of Cooperative Education* since 1964 which involved empirical research. These published studies are mostly based on local populations of professionals at their jobs. From 1973 to 1983, the Department of

Education awarded research grants in cooperative education that resulted in much of the original research found in this literature review. According to Wilson (1988), individuals and organizations not directly involved in cooperative education received 87 percent of this federal research money. Most of the research over the past 25 years has been in program development, coordinator roles, and perceptions and effects of cooperative programs (Wilson, 1988).

In 1972 the Northeastern Cooperative Education Research Center was founded with the primary function of conducting research in cooperative education. It was responsible for about one-third of the funded projects and conducted over 40 research projects since its inception (Wilson, 1988).

When Stull et al. (1997) conducted a previous five-year review of research articles in the *Journal of Cooperative Education*, their results were “lackluster at best,” and they found only 10 articles which listed specific recommendations for further research. Wilson (1997) conducted a similar review of research reported in the *Journal of Cooperative Education* since 1985. He found a total of 60 research articles in the *Journal*. Of that total, only 16 reports related to student or recent graduate, perceptions of the value or satisfaction relative to their internship experience. This review of the *Journal of Cooperative Education* since the 1992 Kraemer dissertation found only four research articles that dealt with student/recent graduate perceptions of their internship experience. In addition, research in *Dissertations Abstracts* discovered only one dissertation since the Kraemer study that dealt with graduate perceptions of a safety and health degree program curriculum by Robert Soule at the University of Pittsburgh (Soule, 1993). The purpose of Soule’s study was to determine the curriculum strengths and

weakness of one of the university ABET accredited degree program involved in the current research. This study did identify the occupational safety and health internship program as one of the strengths of the curriculum but did not evaluate the internship experience in any other way.

One possible development for cooperative education is the emergence of a new paradigm in the 21st century. Finn (1997) envisioned “a paradigm of research, knowledge development, and theorizing, using multiple ways of knowing, to reconceptualize cooperative education as an emerging academic discipline” (p. 36). Already there is an interest in theory-based and theory-developing research in the cooperative education literature (Fletcher, 1989; Wilson, et al., 1996). However, there is speculation about what theory should look like in cooperative education. We might first clarify the sources of our current knowledge theories borrowed from education, developmental psychology, sociology, and other more mature disciplines. Then, through new research initiatives, we might begin to develop knowledge unique to the cooperative education discipline (Finn, 1997).

Kerka (1989) identified several research needs that are directly related to this current research study. Her first identified research need was to evaluate the kinds of learning outcomes that are attained from the cooperative educational process. In addition, she saw research needs in assessing the impact of cooperative education on personal development and the need to identify the characteristics of successful co-op programs.

In summary, research into internship/cooperative education has provided a substantial body of knowledge and has contributed significantly to its continued

development as an educational strategy. However, in light of the growth in cooperative education that forward thinking educators see in the 21st century and the new outcomes-based ABET accreditation criteria for internships in occupational safety and health degree programs, continued research into student perceptions of the characteristics that provide value and satisfaction of their internship experience is vital.

Outcomes Research in Internship/Cooperative Education

According to Freeland et al. (1998), “the beginning of the 21st century represents an era of unprecedented opportunities and challenges for co-op institutions in the United States” (p.17). These authors saw social, economic, and historic forces making cooperative education more relevant than ever with the most exciting aspect being a new emphasis on institutional cooperation among universities, industry, and government to break down barriers to forging alliances that will benefit student, industry, society, and the economy (Freeland, et al., 1998).

The 21st century is bringing with it rapid and sweeping societal and technological changes. The nature and the needs of the workplace are changing dramatically. The number of workers needed is diminishing, the skills demanded are changing, and continued employment must be found in worker competencies. According to Wilson et al. (1996), colleges and high schools today are not adequately preparing students for this new, 21st century, world of work. Gardner (1996), espoused that educational institutions are doing far too little in structuring educational experiences that allow students to practice applying what they have learned in the classroom and reflecting on the consequences of their applications. One way to better prepare students for work is to offer opportunities that introduce them to the workplace while they are still enrolled in

college: “Struggling with the chaotic context of work is an essential element of one’s educational experience” (Gardner, 1996, p. 55).

Dubrick, McNerney, and Potts (1996) asked whether cooperative education is making a contribution to higher education in the 1990’s and if cooperative education meets the expectations and needs of today’s very practical and career-oriented students. These authors found literature support for the fact that students today in higher education are very different from their colleagues of the 1970’s and 1980’s. These students are older, more mature, and have specific, practical needs for a college education. It seems to follow from these findings that today’s more practical college students would appreciate the benefits of participating in cooperative education programs and that such programs should be expanded (Dubick, et al., 1996).

Employers today are demanding skills not developed in schools, according to the results of a national survey conducted by the National Center on the Educational Quality of the Workforce in 1995. Employers, when hiring, are looking for attitude, communication skills, experience, recommendations from current/previous employers, industry-based credentials certifying skills, and years of schooling completed (Wilson, et al., 1996). Employers are looking for new employees with work experience as opposed to hiring students right out of school.

In another study conducted by the Michigan State Board of Education in 1991, the results revealed that employee requirements for the 1990’s included problem solving skills, team approaches with the ability to identify new ideas and to lead or follow as needed, and effective verbal and written business communication skills. The study further suggested that the best vehicle for teaching these skills was not in the traditional

classroom, but in the world of work (Wilson, et al., 1996). These authors believe that experiential learning will provide an effective transition into the 21st century: “Logic suggests that cooperative education and other work-based learning strategies offer an effective remedy for the problems of the changing needs and demands of students, employers, institutions, and ultimately of society itself” (p. 155).

Most of the research reported in the *Journal of Cooperative Education* over the last 10 years detailed differences (or non-differences) between cooperative education participants and their non-co-op counterparts (Wilson, 1997). When the null hypotheses were accepted, suggesting no difference between the two groups on the variables under consideration, the researchers went to some length to explain what may be responsible for the results. However, seldom has as much attention been given to explanations of the positive results of the cooperative learning experience. Wilson (1997) concluded that “while the numbers of studies showing positive results have increased, providing a growing body of supportive literature for cooperative education, explanation have not. Our notions why co-op works have not kept pace with the data showing that it does” (Wilson, 1997, p. 21).

No longer should we treat cooperative education as an educational methodology that is universally the same. As educators respond to the new societal and workplace demands of a new century, “we must begin to examine systematically program characteristics and their relationship to outcomes and we must begin to experiment with different kinds of deliberate intervention” (Wilson, 1997, p. 23). This is exactly the assessment process that must be applied to ABET established outcomes relative to engineering and technology-related cooperative education/internship programs. Graduate

perceptions of the value and key characteristics of an effective internship experience, studied in this research, can be an important part of this process (ABET, 2001).

Wilson (1989) noted that the rationale of educational evaluation is to assess the outcomes of the instructional intervention. Learning requires clear objectives to be accomplished and learning activities devised to facilitate their attainment. An evaluation is the degree to which the goals are met and the function of the learning experience in achieving the goals.

There must be a clear understanding of what is to be evaluated and the purpose to the evaluation when assessing the outcomes of the instructional intervention. Based upon a review of the literature, Wilson (1989) indicated several purposes for assessing the outcomes of cooperative education. Key purposes included the need to clarify the nature and significance of the real-world experience as an instructional method, to assess the effectiveness of a particular program, and to measure the extent to which the student attained the stated objectives of the cooperative educational experience.

A number of student outcomes associated with participation in cooperative education/internships have been identified by current researchers in cooperative education (Cates & Langford, 1999; Dawson, 1989; Finn, 1997; Fletcher, 1989; Girard, 1999; Hall, 1999; Kerka, 1989; NCCE, n.d.c; Page et al., 1999; Wilson, 1989; Wilson et al., 1996;). However, Wilson and Lyons (1961) conducted the first comprehensive assessment of outcomes based on the systematically collected data for their book, *Work Study College Programs*. Today's research findings continue to validate this seminal work.

These early authors surveyed 17 institutions of higher education representing both liberal arts and professional programs. They defined cooperative education as an educational approach and identified the outcomes and values of cooperative education for the student, employer, and the institution of higher education. The study also compared co-op participants to non-co-op students in the areas of attitudes toward work and school, perceived benefits from of education, and other various college attributes (Wilson & Lyons, 1961).

According to Fletcher (1989), a great deal of the research in cooperative education completed in the last three decades has its basis in the attributes, attitudes, and variables first characterized in this landmark research. As we move into the 21st century, the influence of the Wilson and Lyons (1961) research continues to be reflected in much of the current research into outcomes, values, and satisfaction associated with experiential learning.

Fletcher (1989) stated that the majority of the research findings concerning student benefits from experiential learning was derived from studies in the 70's and 80's. She noted that these studies evaluated the validity of hypothesized outcomes by analyzing the differences and similarities between co-op and traditional college students on various attributes. Current studies (Page et al., 1999; Chapman, Coll & Meech, 1999; Cates and Langford, 1999; Girard, 1999; & Hall, 1999) are directed at identifying attributes that contribute to the difference between co-op and non-co-op students. The review of literature indicated that student outcomes can be classified consistent with Fletcher's (1989) findings that outcomes fall in three general areas; career development, career progress, and personal growth.

According to the National Commission for Cooperative Education (2002c), a properly designed cooperative educational experience is designed to develop or enhance the following student outcomes:

1. maturity and responsibility,
2. determination of personal strengths and weaknesses,
3. development/enhancement of interpersonal skills,
4. productive and responsible citizenship skills,
5. lifelong learning skills,
6. understanding of workplace culture,
7. development of workplace competencies,
8. technical knowledge through use of state-of-the-art equipment,
9. professional networking and career management, and
10. ability to integrate classroom theory with workplace practice.

According to Cates and Jones (1999), when cooperative education emphasizes learning outcomes, it necessitates an academic approach that includes emphasis on learning, use of academic assignments, planned learning experiences, and site selection based on learning opportunities.

Personal, Professional, and Career Value

The primary areas researched in cooperative education include career development, academic progress, and personal growth and development (Weston, 1987; Bartkus & Stull, 1997; Stull et al., 1997). Horn (1986) and Kraemer (1992) conducted a mail survey questionnaire of the internship alumni from the Atlantic Center and Murray State University respectively. One of the purposes of both studies was to assess the

degree to which the internship experience enhances personal, professional, and career value. These researchers wanted to evaluate the level of personal, professional, and career value provided by certain aspects or characteristics of the internship experience as well as determine the overall value of the experience.

Both the Horn (1986) and Kraemer (1992) studies showed that between 80 and 90 percent of all graduates believed that the internship experience was important in shaping their personal professional views. Between 70 and 80 percent perceived that the internship was instrumental in developing their career interests, and approximately two-thirds perceived the internship experience as being helpful in determining their career direction and later career choices.

Weston (1987) found that cooperative education programs contribute to a students' intellectual and personal growth as well as their career development. Many researchers agree that one of the primary benefits of experiential learning for students is that the experience enhanced and complemented their classroom learning (Apostolides & Looye, 1997; Cates & Langford, 1999; Girard, 1999; Hagerty, 1981; Hall, 1999; Wilson, 1974; Wilson & Lyons, 1961; Wilson et al., 1996).

In a three-year study of student interns at the University of Maryland, Davis, Steen and Rubin (1985) reported that having practical experience such as internships enhances students' marketability and that there are definite career and academic benefits derived through the internship experience. More than 86 percent of the respondents in this study felt their internships encouraged them to continue working toward their career goals. Nearly 90 percent of the interns agreed that their internship-related class work to the real-world, and 93 percent felt that the internship helped them to better understand

themselves and their interests and goals. More than half of the interns in this study indicated that their internship helped them get a job.

California Polytechnic State University developed a survey questionnaire to assess outcomes of the university's cooperative education program. The survey assessed participants perceived learning outcomes, personal career benefits, program effectiveness, quality, and value of their co-op experience (Equinoa & Shibata, 1998). Findings of this report indicated that students perceived direct benefit from the co-op experience.

Based on quantitative analysis of the survey results, the Cal Poly students reported to have gained professional work experience, clarified career plans, acquired competitive work skills, and developed professional contacts in industry. The qualitative responses identified other prominent benefits that were not specifically incorporated in the survey instrument. These results included improved interpersonal skills, strengthened communication skills, increased understanding of the work environment, and greater confidence in skills and abilities. These students reported to have improved in every outcome area specified in the study. However, program administrators have realized that perceived skill level does not necessarily translate into actual skill level. Therefore, the next step at Cal Poly is to define more rigorously specific learning outcomes that are tied to the College of Engineering's core curricular goals and ABET accreditation. (Equinoa & Shibata, 1998).

A review of the literature indicated that the personal, professional, and career value outcomes have been identified by correlating the relationship between participation in cooperative education programs with certain dependent variables in these three areas

(Equinoa & Shibata, 1998; Kraemer, 1992). Fletcher (1989) noted that job and student characteristics are important variables to consider in assessing the nature of the outcomes associated with cooperative education. Research into cooperative education has provided a firm, empirical base for understanding and continued development of experiential learning as an educational strategy (Wilson, 1988).

Satisfaction and Usefulness

There are many suggestions as to how internship programs might be set up, but little evidence about what actually yields a positive experience for the student (Finn, 1997; Girard, 1999; Hall, 1999; Wilson, 1997). It is difficult to determine what will make an internship a satisfactory experience for the student intern (Kraemer, 1992). The interns' levels of satisfaction may be affected by whom they work for, by the kinds of work they do, by their institutional assessments, by where they are placed, by their salary level, and many other factors (Coll, Eames, & Halsey, 1997; Stonecash, Pecorella, & Winegar, 1988).

Brinkerhoff, Chase, and Katz (1982) reported the results of their study at the eleventh Annual Conference of the National Society for Internships and Experiential Learning. Their study focused on an evaluation of the internship experience at the University of Nebraska aimed at comparing overall satisfaction by both students and supervisors with their internship experience and determining the relationship between specific aspects of the internship experience and the perceived success as viewed by the student interns. The findings of the research survey questionnaire showed that several characteristics contributed to a satisfactory internship experience. The most significant factors included matching students to jobs, establishing realistic expectations and

learning objectives, providing initial orientation at the work site, and the relationship between the intern and the site internship supervisor.

Several studies have shown that the quality of and the student satisfaction with the internship experience are directly related to the organization and administration of the internship program and the dedication of the onsite supervisor (Ciofalo, 1992; Kendall, 1992). Horn (1986) used a Likert-type scale to rate attributes or characteristics that were most important to student satisfaction with the internship experience. He used a four-point scale with 1 indicating “not satisfied” to 4 indicating “very satisfied”. A mean level of satisfaction above 2.5 indicated the respondents were satisfied with that particular characteristic, and a rating above 3.0 indicated a very high degree of satisfaction. The study results indicated that the five attributes identified as most important also had a high mean value for satisfaction, above 3.0 on the four-point scale.

In a study by Krebs (1987), the perceived usefulness of the cooperative education experience was studied. He analyzed student perceptions and found a strong correlation between usefulness of the co-op experience and the degree of relevance and challenge present in the work experience. As a result of his findings, Krebs (1987) developed the following recommendations to enhance the usefulness and level of satisfaction of the cooperative education experience: provide a challenging co-op experience for interns, ensure a good match between the work experience and the career goals of the students, assist the students to develop and refine a career plan before the co-op experience takes place, and choose a co-op company that can provide a good fit with the student’s career plans, ability, and maturity. The findings of this study are consistent with recent research

findings used to develop key elements of the new Northeastern University cooperative education model which will be discussed later in this review.

Characteristics

Brinderhoff, Chase, and Katz (1982) conducted a study of student perceptions of the attributes or characteristics of their internship experience that were most important to them. The student interns were asked to select from a list of ten attributes that were most important to them in rank order. The attributes identified from this study were:

1. exploring a career,
2. using and developing professional skills,
3. working in a chosen profession,
4. gaining practical experience for resume'-building,
5. applying theory to real situations,
6. using and developing basic skills,
7. taking responsibility for ones own learning,
8. clarifying personal values,
9. experiencing another cultures, and
10. developing job hunting skills.

The results of this study indicated that students are most likely to perceive internships as being directly related to career and personal development. Two of the four top attributes are related to job testing, exploring a career and resume'-building, and the other two in the top four related to professional goals, using and developing professional skills and working in a chosen profession.

In a similar study, the attributes that contribute most to a worthwhile internship or experiential learning program were studied by Horn (1986). He examined many different internship attributes that were common to many experiential learning programs and identified the following key program attributes:

1. practical value of internship results,
2. intern autonomy,
3. cross-cultural experience,
4. association with permanent staff,
5. association with other interns,
6. orientation,
7. association with other professionals,
8. specific project objectives,
9. in-house evaluation,
10. alumni support and activities,
11. job description,
12. job and career guidance,
13. amount of stipend,
14. producing a follow-up, and
15. pre-orientation preparatory materials.

Horn (1986) had each participant rate each attribute's importance as it related to a worthwhile internship experience and then identify the three they considered to be the most important. The results of this study indicated that the five attributes which stood out

as being particularly significant were practical value, intern autonomy, cross-cultural experience, association with other intern, and association with a professional staff.

Instruments

The review of literature indicated that most internship/cooperative education assessments of the value and satisfaction of the internship experience have been conducted by researchers constructing their own instrument or by using some combination of existing instruments. This occurs because published instruments usually do not measure precisely what the evaluators seek to measure (Wilson, 1988). Wilson noted that with regard to specific modes of measurements of cooperative education outcomes, the specially designed questionnaire is the primary instrument for data collection. Other researchers in the field of experiential learning agree that evaluators and researchers are increasingly developing scales consisting of several items to measure outcomes variables (Krebs, 1987; Girard, 1999; Weston, 1987).

Kraemer (1992) reviewed several existing questionnaires before choosing three for closer review--Horn, 1986; Brinderoff, Chase and Katz, 1982; and Kaas, 1985. Although these existing instruments measured related constructs, Kraemer (1992) determined that these instruments did not measure precisely, or even closely, what he wanted to measure in his study of student perceptions of personal, professional, and career value of an occupational safety and health internship experience and the determination of the characteristics that contribute most to a worthwhile internship experience.

The Murray State University Study

Kraemer (1992) stated that the purpose of the Murray State University internship study was to:

1. Assess the degree to which the Murray State University occupational safety and health internship experience provided personal, professional and career value for occupational safety and health graduates;
2. Determine those attributes that contribute most to worthwhile occupational safety and health graduates;
3. Ascertain the extent to which occupational safety and health graduates were satisfied with the accomplishment of specific attributes that were related to the internship experience; and
4. Determine those demographic and internship characteristics that contribute most to the overall satisfaction of an internship experience for occupational safety and health graduates.

According to Kraemer (1992), the results of study data analyses showed the Murray State University occupational safety and health graduates were overwhelmingly satisfied with their internship experience and placed a moderate to high value on their internship experience. Each of the 18 stated internship characteristics studied had 80 percent or more of the respondents indicating that the characteristics were somewhat or very important to an occupational safety and health internship experience. By placing a high level of importance on all 18 internship characteristics, the occupational safety and health graduates demonstrated that these activities are also essential to an occupational safety and health internship experience. Their responses confirmed that practical

experience through an internship provided an effective transition from college to the workplace.

Key Internship Characteristics

Kraemer (1992) reported that the six internship characteristics which received the highest levels of importance from the occupational safety and health students were:

1. using and developing basic skills,
2. learning skills from experience,
3. gaining confidence in technical skills,
4. obtaining ability to take responsibility, acknowledging consequences of actions,
5. interacting with management, and
6. working cooperatively with others.

The Kraemer (1992) study found a significant positive correlation between the salary earned by interns and the personal, professional and career value scores and the level of satisfaction with the occupational safety and health internship experience. In fact, salary made a significant contribution over and above that of the other variables in combination for level of satisfaction of the internship experience. Kraemer also reported a statistically significant difference between the level of satisfaction and personal, professional, and career value in the internship experience and various internship sites. Kraemer also found the chemical industry, manufacturing industry, and various other industrial sites were preferred over consulting firm and government agency sites.

In Kraemer's (1992) study, the interns who worked at chemical industry sites had the highest level of satisfaction. There were several possible reasons for this finding:

higher average salary, more safety and health professionals to serve as mentors, and management's commitment to safety and health. It appeared that lower average salary, longer working hours and the travel required of interns at consulting firm sites accounted for the lower levels of satisfaction and value of their internship experience. In addition, the majority of the consulting firm internships dealt with asbestos abatement which was not perceived as desirable work by the interns. This type of work is generally less challenging and performed under poor working conditions. Kraemer (1992) thought this could contribute to the lower satisfaction and value placed on consulting firm internship experiences.

The Student Profile

Kraemer's (1992) study indicated that the typical occupational safety and health intern at Murray State study was a white male. This profile closely fits that of the safety and health professionals reported by Manuele (1990). However, more women and minorities are enrolling in university safety and health programs as witnessed by the recent rise of women and minorities in Murray State University's internship program. The field of safety and health is growing rapidly and the opportunities for women and minorities are numerous (Kraemer, 1992). As pointed out by the National Commission for Cooperative Education (1999), internship programs improve access to and by minority students for permanent employment. A cooperative effort by the intern, the sponsoring employer, and the academic institution built around the characteristics of an effective internship program, as outlined in the Murray State University study, will result in a high-quality educational experience for the occupational safety and health student.

This effective experiential learning component will help students bridge the gap between academia and the world of work (Kraemer, 1992).

Recommendations to Improve Internship Programs

Kraemer (1992) established specific recommendations to improve the effectiveness of internship programs in occupational safety and health. The following were Kraemer's general recommendations:

- 1. Publicize the results of the Murray State University study in appropriate journals for maximum exposure to students, employers and universities (*Journal of Cooperative Education and Professional Safety*);**
- 2. Support development and implementation of occupational safety and health internship programs as a degree requirement for occupational safety and health majors; and**
- 3. Refer to the qualitative results of the Murray State University study pertaining to the occupational safety and health internship experience which are beneficial to students, employers and universities.**

Recommendations for Students

Kraemer (1992) also made the following recommendations for students considering an internship experience in the occupational safety and health career field:

- 1. Take advantage of quality occupational safety and health internship programs through universities and employers making this type of experiential learning available;**

2. **Take responsibility for selection of and participation in an occupational safety and health internship experience that will provide personal, professional and career value as well as a satisfying experience; and**
3. **Research the company carefully before accepting an occupational safety and health internship position. Learn about responsibilities and duties, and read the job description.**

Recommendations for Employers

The Murray State study (Kraemer, 1992) outlined recommendations for employers offering or considering offering an internship experience in occupational safety and health:

1. **Recognize the importance of the following characteristics when developing a quality occupational safety and health internship experience; (a) using and developing basic skills, (b) learning skills from experience, (c) gaining confidence in technical skills, (d) obtaining ability to take responsibility and acknowledge consequence of actions, (e) interacting with management, and (f) working cooperatively with others.**
2. **Support development and implementation of occupational safety and health internship programs to provide real-world experiences for the future safety and health professionals;**
3. **Recognize the necessity of an on-going, informal assessment of the occupational safety and health internship experience which would include occasional interviews with the interns and supervisors, evaluations during and after the internship experience and casual conversations with the interns; and**

4. **Develop and implement a strategy for recruiting occupational safety interns, such as job fairs, on-campus visits, brochures, and media presentations.**

Recommendations for Colleges and Universities

The Murray State study (Kraemer, 1992) concluded with specific recommendations for colleges and universities offering or considering offering an internship experience in occupational safety and health. These recommendations were as follows:

1. **Examine all results of the Murray State University study and initiate appropriate changes in the occupational safety and health internship program as indicated or needed;**
2. **Recognize the importance of the demographic and internship information variables of salary and internship sites when developing internship programs with industry; salary and internship site differences influence the interns' level of satisfaction and the level of personal, professional and career value of the occupational safety and health internship experience;**
3. **Develop and distribute guidelines to employers for selecting, placing and monitoring of occupational safety and health interns;**
4. **Report the results of future studies to the National Institute of Occupational Safety and Health (NIOSH), the American Society of Safety Engineers (ASSE), and other occupational safety and health programs. The results can be used to review and possibly revise existing course curriculum and internship programs; and**

5. **Plan and develop a student policy manual for the occupational safety and health internship program, including steps to obtain an internship, working and learning tips, and a variety of evaluation criteria.**

Recommendations for Future Research

Kraemer (1992) made the following recommendations for future research based on his research finding relative to student perceptions of the value and satisfaction of the occupational safety and health internship experience:

1. **Use a larger population of occupational safety and health interns to allow for more generalizability of any future study results;**
2. **Conduct similar studies at different universities who have ABET accredited occupational safety and health programs which may help determine if factors such as the university environment, program curriculum and internship preparation contributed to the results;**
3. **Conduct additional research on occupational safety and health graduate students since the subjects in this study were mainly occupational safety and health undergraduate students, and results of this study may be appropriate for occupational safety and health undergraduate students only;**
4. **Conduct research on past and future occupational safety and health interns to allow for comparisons to determine if changes in perception of the internship experience occurred as a result of curriculum and preparation changes;**
5. **Revise the Internship Survey Questionnaire based on the findings of this study; in order to reduce the length of the questionnaire, some of the items**

related to variables that could not be shown or were not found to be statistically significant predictors could be eliminated;

6. Present the results of this study to the National Institute of Occupational Safety and Health and the American Society of Safety Engineers and explore the opportunities for future occupational safety and health internship research;
7. Conduct a congruent study which assesses the perceptions of the occupational safety and health internship experience by the student intern and the employer;
8. Conduct qualitative (i.e., nominal group process, interviews) studies with occupational safety and health interns to assess strengths and weaknesses of the internship program; and
9. Conduct similar studies at the same university annually to ascertain any similarities and differences that may occur as different students become potential subjects; these studies may provide information on how occupational safety and health interns are responding to curriculum and programmatic changes.

This study will replicate the Kraemer (1992) study and will expand that research by addressing five of the nine recommendations for future research listed above.

The Cooperative Education Model

According to Itin (1999), “No discussion of experiential education would be complete without considering the writings of John Dewey. Dewey’s writings reflect the progressive education movement in the United States” (p. 92). John Dewey’s (1916) important work, *Democracy and Education*, introduces the importance of experience in

learning and serves as the basis for today's cooperative education models. Dewey established the first documented link between reflection on work experience and its relation to classroom education as being essential to true understanding of the subject matter (Dewey, 1916). Dewey believed the purpose and the function of education was to help prepare students for effective and satisfying citizenship. In like fashion, current proponents of cooperative education provide student with work experience not for its own sake but because they believe it will help students achieve important learning which will contribute to their effective citizenship (Wilson, 1987; Saltmarsh, 1992).

Dewey's (1938) later publication, *Experience and Education*, further explains his thinking on experiential education. The basis of Dewey's philosophy was that education was not simply the transmission of facts but was the relationship between the process of life experience and the process of education. He recognized experience as having a primary role in learning and viewed the educational process as the involvement of teacher and learner engaged in purposive experience (Dewey, 1938). Dewey had a great influence upon educational thought and practice, as one of his central beliefs was that people learn from experience and from doing.

Although Dewey made an important philosophical contribution as to how people learn, his educational philosophy is not reflected in cooperative education as we know it today. Dewey stressed the role of education as independent from the structure and content of jobs and as an instrument to alter social relations in a market capitalist economy (Saltmarsh, 1992). "Dewey favored an educational system combining theory and practice that was dysfunctional to capitalist development, creating contradictions in

the social relations of production, thereby altering the work process” (Saltmarsh, 1992, p. 13).

Dean Schneider of the University of Cincinnati proposed an alternative model of industrial experiential education which stressed the functional connection of education to the workplace. Schneider believed that “education is intended to reproduce the dominant capitalist relations of production through the mechanistic correspondence between school and work, thus reproducing the unequal hierarchies and unequal class relations associated with a capitalist workplace and society” (Saltmarsh, 1992, p. 13). Many early cooperative education programs adopted the Cincinnati plan (Wilson, 1987).

Schneider believed the workplace was at the center of learning whereby students learning on the job and in the classroom would be molded to a set of predetermined workplace standards, much like the ABET standards established for accreditation of today’s engineering and technology internship programs. What we practice today as a cooperative education model is fundamentally affected by the intellectual inheritance left by Schneider (Saltmarsh, 1992).

In summary, cooperative education “is the legacy of the genius and persistence of one man (Dean Schneider), of a changing society that required an educated citizenry, and of a changing system of higher education that became involved in the affairs of the community about it” (Wilson, 1987, p. 11). Cooperative education started as a single program in 1906 and has grown both in numbers and in applications. However, its mode of operation has been modified to meet the current needs such as ABET accreditation of safety-related internships programs.

The Cincinnati plan has been refined in David Kolb's 1984 book, *Experiential Learning: Experience and the Source of Learning and Development*, which is another important work that is reflected as the basis for much of the current thinking linking classroom theory to actual practice. Kolb describes his experiential learning model as a four-part process where the learner is asked to engage in a new experience, reflect on that experience, conceptualize the experience and integrate it with past experiences. According to Kolb (1984), the learner must continue cycling through these four parts thereby creating new learning. Beaudin and Quick (1995), noted that "a learner might begin anywhere in the cycle at any level of knowledge concerning the subject matter. The facilitator's job is to guide them through each part in an ever increasing level, expanding their learning of a topic" (p. 15).

Kolb (1984) defined experiential learning as a process whereby knowledge is created through the transformation of experience. Critical aspects of Kolb's learning process included the emphasis on the process of adaptation and learning as opposed to content or outcomes; knowledge is a transformation process, being continuously created and recreated, not an independent entity to be acquired; and learning transforms experience in both its objective and subjective forms (Kolb, 1984).

Stehno (1986) reviewed seven models of experiential learning and found that each model includes action that creates an experience, reflection on that action and experience, abstractions drawn from the reflection, and application of the abstraction to a new experience or action. All of these models reflect Kolb's (1984) work in experiential learning. Boud and Walker (1992) developed an experiential learning model that also incorporated these concepts of experience and reflection but preceded the experiential

learning process with an important preparation stage. This preparation stage is an essential component of the current, most effective models of cooperative education found in this literature review.

As important as the preparation stage is, reflection on the actual work experience is key to experiential learning. Canale and Duwart (1999) noted that co-op programs generally have no ongoing, formally structured feedback process for students during work periods: "Formal reflection often occurs, if at all, after the work assignment is completed" (p. 25). However, Schoen (1983) demonstrated that reflection is the key to experiential learning and that reflection-in-action which occurs during the work experience is more effective than reflection which occurs after the work experience. Daudelin (1996) also found evidence suggesting that actively guiding the reflection process enhances learning. Page et al. (1999) found that "a sense of professional responsibility is encouraged when site personnel expect students to reflect on their experiences while not on duty" (p. 43).

Ferguson (1998) noted that although ABET required that accredited safety degree programs include an internship or cooperative education program, they provided limited guidance on the structure of this experiential learning component. Ferguson identified the need for guidelines that go beyond the general ABET criteria to ensure development of a successful safety internship program (Ferguson, 1998). To maximize student experiential learning, we must bring that learning into the students' conscious minds. Through a series of questions, reflection, and feedback from their colleagues, co-op students begin to create a deeper understanding of their work activities (Cates & Jones, 1999).

Canale and Duwart (1999) have applied these research findings through the development of a successful web-based experiential program at Northeastern University. This university program, Project ECE COOP 2000, allows for guided reflection during the activity/work phase of the cooperative education experience for students in the Northeastern ABET accredited Electrical and Computer Engineering program. This web-based program uses the Internet as a vehicle to enhance student learning during the work period of the co-op experience through continuous reflective dialogue and through facilitation of dialogue that connects the students' work experiences to their academic curriculum (Canale & Duwart, 1999). Using the Internet, these students "accessed newly designed structured learning assignments on the ECE Co-op Web page and responded asynchronously via email or computer conferencing to their co-op faculty coordinators and to each other" (p. 26).

According to Wilson (1987), "cooperative education is a particular application of the concept of experiential learning in which productive work performed by students is integrated into the curriculum and for which the institution assumes primary responsibility" (p.2). Research studies conducted by the National Commission for Cooperative Education found that students, employers, and colleges that offer cooperative education get a distinct edge on the competition. These three groups are partners in a successful academic program, which are more relevant than ever before in building the high performance workforce necessary in the 21st century (NCCE, 1999).

Cooperative education is a structured educational strategy integrating classroom studies with learning through productive work experiences in a field related to the intern's academic or career goals. It provides progressive related experiences integrating

theory and practice. The National Commission for Cooperative Education (NCCE, 2002c) has established the following essential characteristics necessary for an effective cooperative education model:

1. Formal recognition by the institute of higher education as an educational strategy integrating classroom learning and progressive work experiences, with a constructive academic relationship between teaching faculty and co-op faculty or administrators;
2. Structure for multiple work experiences in formalized sequence with study leading to degree completion;
3. Work experiences which include both an appropriate learning environment and productive work;
4. Work experiences related to career/academic goals;
5. Formal recognition of the co-op experience on the students transcript,
6. Pre-employment preparation and ongoing advising for student interns,
7. Agreement among the college, employer, and the intern on job description and new learning opportunities,
8. Work monitored by the college and supervised by the employer,
9. Evaluations by the student, the college, and the employer, with guided reflection by the student intern,
10. Provisions for employer and college evaluation of quality and relevance of the work experience and curriculum, and
11. Structured to maximize outcomes for the student, employer, and the college.

The National Commission for Cooperative Education (2002c) promotes their model of cooperative education as being designed to develop or enhance student, employer, institutional, and societal outcomes. This model incorporates all of the key elements that have evolved from experiential learning research findings of John Dewey to the current research findings at Northeastern University that relate directly to competencies required of today's ABET accredited engineering graduate.

The Future: Outcomes-Based Accreditation

When a college sends students off campus to co-op/internship sites, the students have a right to expect a high-quality, professional learning experience. However, the college faces a dilemma: On one hand it wants students to receive high-quality learning experience, while on the other hand, it exercises little quality control of the internship site activities (Page et al., 1999). The cooperative education experience should provide students with the opportunity to develop those skills/outcomes which industry has identified as critical for success (Cates & Jones, 1999). Ensuring and documenting effective student learning outcomes is essential to the outcomes-based accreditation criteria established for ABET accreditation of safety-related bachelor and master degree programs.

While it is the educational institution's responsibility to provide the framework for the cooperative education experience, it is up to the intern employer to execute and often to improve upon that framework (Cates & Jones, 1999). Cooperative education employers are some of the most powerful instructors that the co-op students will ever have. They provide a real-world perspective and real-world situations that prove invaluable to students' learning, professional growth, and career development (Cates &

Jones, 1999). As partners in the outcomes-based educational process, it is essential that institutions of higher education are working closely with the intern employer to ensure learning objectives are accomplished to satisfy established learning outcomes.

Page et al. (1999) established nationally-based quality guidelines for co-op/internship sites to help colleges be proactive in establishing quality expectations at the onset of the experience rather than reactively dropping an unsatisfactory site after a negative experience. These authors suggested eight categories of indicators of co-op/internship site quality: relevance of work, on-site instruction, problem solving, communication, social/personal development, career awareness, professional development, and student involvement. The survey questionnaire instrument developed by Kraemer (1992), and modified for this study, will effectively address each of these eight categories of quality indicators and assess the student perception of the personal, professional, and career value their internship experience. Positive survey questionnaire results will likely satisfy ABET outcomes-based criteria for the internship experience in ABET accredited, or potentially accredited, safety-related programs of study.

Numerous studies have been conducted dealing with cooperative education/internships; few studies have dealt specifically with graduate perceptions of the value and key characteristics of their on-site internship experience. Only one study of graduate perceptions of the occupational safety curriculum has occurred since the Kraemer (1992) study. This study (Soule, 1993) did not address the value or the characteristics of the required internship experience in that safety-related curriculum assessment.

In 1999 Northeastern University conducted a survey of seniors to determine the influence of classes, labs, and co-op education toward their preparation for an engineering career and the engineering educational outcomes established by the ABET. This survey was based on the 11 attributes established by ABET that a graduate from an accredited engineering program should demonstrate upon graduation (Northeastern University Department of Electrical and Computer Engineering, 2001).

The eleven attributes are the basis for the ABET 2001 outcomes-based accreditation for engineering degree programs and are summarized below. ABET (2001) accredited engineering programs shall demonstrate that their graduates have:

1. An ability to apply knowledge of mathematics, science and engineering;
2. An ability to design and conduct experiments and analyze data;
3. An ability to identify, formulate, and solve engineering problems;
4. An ability to design a system, component, or process to meet desired needs;
5. The broad education necessary to understand the impact of engineering solutions in a global context;
6. A knowledge of contemporary issues;
7. A recognition of the need for and ability to engage in lifelong learning;
8. An ability to use techniques, skills and modern engineering tools necessary;
9. An ability to communicate effectively;
10. An ability to function on multidisciplinary teams; and
11. An understanding of professional and ethical responsibility.

The Northeastern study indicated that senior students attributed 41 percent of their attainment of these outcomes to classroom and laboratory study, 52 percent to their

cooperative educational experience, and the remaining 8 percent to various other life experiences (Northeastern University Department of Electrical and Computer Engineering, 2001). Similar studies were conducted on seniors in the co-op education program in the engineering department at the University of Cincinnati with similar results (Canale, Cates, & Duwart, 2000). These and other recent studies clearly demonstrate the significant role experiential learning can play in student development if the experiential learning program is properly designed and administered (Apostolides & Looye, 1997).

An assessment of the graduate perceptions of the internship experience may provide information needed in developing or revising internship programs at colleges and universities with occupational safety and health (OSH) programs. In addition, student perceptions of learning outcomes of the internship experience is instrumental in the accreditation process for colleges and universities with ABET accredited OSH programs.

ABET Accreditation

ABET is a federation of 31 professional engineering and technical societies, which has provided quality assurance of education through their accreditation process since 1932. ABET is recognized by the Council on Higher Education Accreditation and accredits some 2300 engineering, engineering technology, and applied science programs at over 500 colleges and universities nationally (ABET, 2002).

The American Society of Safety Engineers (ASSE) is the professional society that established the outcomes-based criteria that ABET adopted for accreditation of safety, occupational safety, industrial safety, and similarly-named engineering-related college or university degree programs. ABET (2001) accredited safety-related programs for both

bachelor's and master's degree level programs shall demonstrate that their graduates have:

- 1. An ability to apply knowledge of mathematics and science;**
- 2. An ability to analyze and interpret data;**
- 3. An ability to anticipate, identify, and evaluate hazardous conditions and practices;**
- 4. An ability to develop hazard control designs, methods, procedures, and programs;**
- 5. An ability to function on multi-disciplinary teams;**
- 6. An understanding of ethical and professional responsibility; and**
- 7. Knowledge of contemporary issues within a global society context.**

The ABET criteria for accreditation of a safety-related curriculum states that the students should be given the opportunity to apply principles of safety and health in a non-academic setting through an intern or cooperative work experience (ABET, 2001). A properly designed and administered occupational safety and health internship experience is an ideal opportunity for the safety-related graduates to demonstrate their competency in the required ABET program outcomes.

Each ABET accredited program must have an assessment process with documented results. The assessment process must demonstrate that these outcomes are being measured. Evidence of achievement of the established outcomes may include student portfolios, design projects, nationally-normed subject content exams, alumni surveys, employer surveys, placement of graduates, and more (ABET, 2001). Properly documented internship student reflections and positive survey results of both students and

recent graduates using the internship survey questionnaire developed for this study should provide significant institutional demonstration of achievement of the ABET required program outcomes.

The above referenced surveys conducted by Northeastern University and the University of Cincinnati of students in ABET accredited engineering programs also provides strong evidence of student attainment of the competencies required for ABET program accreditation. The results of this author's survey research of ABET safety-related program graduates could provide similar evidence necessary for ongoing ABET re-accreditation of the five university programs involved in this study.

A Successful Outcomes-based Co-op Model

Northeastern University Department of Electrical and Computer Engineering (2001) has developed a Cooperative Education Learning Model that has proven effective as it relates to educational outcomes for students in ABET accredited engineering programs. This cooperative education process can be viewed as a three-part process. The first phase is preparation in which students prepare for the coop work experience. Second is the actual work phase, and third is the reflection phase in which students can reflect upon their work experiences and integrate them into a more cohesive whole.

The Northeastern co-op model incorporates the essential characteristics of an effective cooperative education program outlined above and developed by the National Commission for Cooperative Education (2002c). In addition to meeting these general essential characteristics, the Northeastern model also meets the specific requirements developed by the NCCE (2002c) for ABET baccalaureate programs in engineering fields. These ABET specific requirements include a formalized employer role in the co-op

program design, a minimum of one year experience, and documentation of student completion of the co-op program (Canale & Duwart, 1999; NCCE, 2002c; Canale et al., 2000).

According to Northeastern University (2002), the major objectives for the Preparation Phase include that each student:

1. Understands the concept, the mechanics, and the expectations of cooperative education;
2. Understands the expectations of the university and employer;
3. Assesses his/her needs, skills, abilities, interests, ethics, and values;
4. Learns about options and opportunities within the career field;
5. Aligns self-assessment with objective reality;
6. Evaluates potential engineering co-op employers and positions;
7. Practices decision making;
8. Produces a professional resume';
9. Becomes knowledgeable about and demonstrates effective interviewing skills;
and
10. Develops short and long-term goals.

In the Activity Phase of the cooperative education experience, the major objectives are that each student:

1. Works in a career related position;
2. Seeks and accepts higher levels of complexity in work assignments;
3. Becomes a productive member of the workplace;

4. **Communicates verbally and in writing with team members, supervisors, and others in the workplace;**
5. **Works with a diversity of individuals and organizations in both the workplace and in the community;**
6. **Becomes proficient in information literacy and technological tools;**
7. **Performs responsibly in his/her personal and professional actions;**
8. **Connect course work to co-op work, theoretical to applied, college to the world of work, and college study to lifelong learning; and**
9. **Performs professionally in his/her jobs, work environments, and other relationships (Northeastern University, 2002).**

During the Activity Phase, students are expected to continually draw on both the preparation and the reflection activities from both outside and within their co-op work to insure purposeful learning occurs. Although the Activity Phase is fixed by a specific time frame, Preparation and Reflection occur through all phases of the co-op experience (Northeastern University, 2002).

The major objectives for the Reflection Phase are that each student:

1. **Makes connections between course work and co-op work;**
2. **Makes connections between the theoretical and the applied;**
3. **Makes connections between college and the world of work;**
4. **Makes connections between college study and lifelong learning;**
5. **Understands the co-op job, work environment, and relationships with others;**
6. **Identifies and understands ethical dilemmas in the workplace;**
7. **Understands how to work with a diversity of individuals and organizations;**

8. Understands and strengthens decision making skills; and
9. Understands and articulates the evolving technology and its implications.

Each student reflects on his/her co-op experience during the activity period and then completes a formal reflection activity in the subsequent school period. During this reflection, the student will articulate the personal and professional growth that occurred during the activity phase. It is during this Reflection Phase that the student will formally make the connection between classroom and co-op learning. The students earn an S grade only after satisfactory completion of all three phases of the co-op experience described above (Northeastern University, 2002).

Northeastern University has embraced a new model of undergraduate education that combines the best aspects of professional education, the liberal arts, and cooperative education to prepare students for the 21st century. The university calls this new model “practice-oriented.” The College of Arts and Sciences has built new bridges to professional curricula, and faculties in cooperative education and the other colleges have worked to develop stronger ties to the classroom and enriched the on-the-job experiences (Northeastern University, 2002). This university-wide effort toward improving undergraduate education coupled with a proven model of cooperative education that meets NCCE (2002c) and ABET (2001) criteria results in a cooperative education/internship experiential learning approach that should be considered by colleges and universities that want to make the most of the experiential learning component of their educational offerings.

Summary, Conclusions, and Implications

Recognizing occupational safety and health as a relative new career field, this literature review identified key events in the evolution of this career path. Next, a brief background of the development of experiential education, and specifically internships, was discussed. The background and development of experiential education was followed by a look at the values and benefits of internships. With these benefits in mind, current research efforts into determining key characteristics of a successful internship experience were discussed. The Murray State University study findings by Kraemer were discussed along with more current research findings at Northeastern University and the University of Cincinnati as these results relate to established ABET outcomes-based criteria.

A brief review of the history of the occupational safety and health movement in the United States and how that movement has resulted in the development of a relatively-new career field is necessary to appreciate the education and training efforts that have evolved to support this emerging new career field. This historic perspective, coupled with future projections of trends in the occupational safety and health career field, help justify the need for this study into the experiential learning component of the occupational safety and health educational process.

These are challenging times for all involved in occupational safety and health programs in higher education. The next decade presents uncertainty for both industry and education, which will influence internship and cooperative education. It is necessary for colleges and universities offering occupational safety and health programs to maintain a flexible strategy and embrace a new paradigm of developing highly interdependent

collaboration with employers. These conditions make internship education an important aspect for all involved in occupational safety and health programs in higher education.

A quality experiential learning component can effectively bridge the gap from the classroom experience to the workplace. Enhancement of occupational safety internships through recommendations resulting from the Murray State study will result in a more effective internship experience. The resulting improved learning environment has the potential to move experiential learning to a new level of excellence in the 21st century. The result will be development of a more effective safety and health professional in the future.

The passage of the Occupational Safety and Health Act of 1970 sent a clear signal to both employers and universities that the time had arrived for formalization of undergraduate academic programs to prepare students for careers in occupational safety and health (Soule, 1993). Prior to this time, safety functions in industrial, institutional, and government institutions were performed by persons with varied backgrounds, most without college degrees of any nature. Safety training was mainly of an on-the-job type (National Safety Council, 2001a). In order for both public and private sector employers to be successful and efficient, management had to realize that safety and health was an integral part of the organization. Industry began to recognize the need for and demand formal, professional education and training as the regulatory environment and working conditions became more complicated. Expanding employment opportunities in occupational safety and health will increase the need for both undergraduate and graduate safety-related degree programs in the future (ASSE, 2002; NSC, 2001a).

The brief evolution of the history of experiential education provides insight into its impact on today's programs in higher education. Premont (1998) noted that internships have become an important instructional methodology and are being widely used in many educational disciplines. However, quality education requires both traditional information assimilation and experiential learning. The strengths and weaknesses of these two types of learning are mutually complementary with the strengths of experiential learning compensating for the weaknesses of information assimilation and vice versa. Internships have long been required in professional fields such as medicine, social work, and engineering. However, today internships are increasingly being recognized as necessary to round out information assimilation in many other fields of employment (Premont, 1998).

The review of literature shows that many internship programs are effective only when they are carefully planned to coordinate classroom learning and work experiences with clearly defined learning objectives designed to tie classroom theory to practice. Properly designed work-integrated learning assignments assist students in making an effective transition from school to work (Canale & Duwart, 1999; NCCE, 2002c; Northeastern University, 2002; Page et al., 1999).

Numerous studies and articles have stemmed from the seminal work done by Wilson and Lyons (1961), which identified the benefits of internship/cooperative education programs of the primary participant groups. Many of these studies have documented the need for active involvement of these primary participants--the student intern, the employer, and the faculty coordinator.

Research into internship/cooperative education has documented the outcomes and the personal, professional, and career values of a well designed cooperative educational experience. Fletcher (1989) classified student outcomes into three areas: career development, career progress, and personal growth. Research to date has contributed significantly to the continued development of experiential learning as an educational strategy. Continued research into the characteristics that contribute most to a worthwhile occupational safety and health internship experience that will enhance personal, professional, and career values, and also satisfy the new outcomes-based ABET 2001 accreditation criteria is vital (Canale & Duwart, 1999).

The Murray State University study (Kraemer, 1992) addressed these key internship characteristics that contribute to student perceived value and satisfaction relative to the occupational safety and health internship. However, this study was limited by the population studied which thereby limited the ability to generalize results to other ABET accredited degree programs and associated internships. Future research is needed to identify the key characteristics of the safety-related internship experience that will contribute to personal, professional, and career value of students in ABET accredited internship programs.

The survey questionnaire developed and used by Kraemer (1992) in the Murray State study satisfies the research instrument concerns raised by Wilson (1988) and is specific to the variables of interest to satisfy additional research required to meet the needs of the current study. The Kraemer instrument, as modified for this study, will address the current criteria for an effective cooperative education/internship experience established by NCCE (2002c) and ABET (2001).

Wilson (1997) noted that “we must begin to examine systematically program characteristics and their relationship to outcomes and we must begin to experiment with different kinds of deliberate intervention” (p.23). This is the assessment process that must be applied to ABET established accreditation outcomes relative to the internship experience at university with, or desiring to have, ABET accredited programs in occupational safety and health. Graduate perceptions, expressed through the Kraemer survey instrument, of the value and key characteristics of an effective internship experience can be an important part of the ABET accreditation process.

There must be a clear understanding of what is to be evaluated and the purpose of the evaluation when assessing the outcomes of the instructional intervention. Wilson (1989) indicated several purposes for assessing the outcomes of cooperative education as follows: to clarify the nature and significance of the real-world experience as an instructional method, to assess the effectiveness of a particular program, and to measure the extent to which the student attained the stated objectives for the cooperative educational experience. The Kraemer survey questionnaire proved effective in assessing the value of and the satisfaction with the occupational safety and health internship experience.

The results of the current research of ABET safety-related program graduates could provide the evidence necessary for ABET reaccreditation of the five university programs involved in this study. In addition, the results of this study could identify characteristics that are directly related to the desired outcomes of an effective internship program that provides personal, professional, and career value along with student satisfaction with the internship experience.

CHAPTER III

METHODOLOGY

The purpose of this study was to: assess the degree to which the occupational safety and health internship experience provided personal, professional, and career value for occupational safety and health graduates; determine those characteristics that contribute most to a worthwhile internship experience for occupational safety and health graduates; ascertain the extent to which occupational safety and health graduates were satisfied with the accomplishments of specific characteristics that were related to the internship experience; and determine those demographic and internship characteristics that contribute most to the overall satisfaction of an internship experience for occupational safety and health graduates. This chapter contains a description of the quantitative and the qualitative research methods used to accomplish the purpose of this study. The following areas are discussed: research design, participants and site, measures, validity and reliability, human subjects, data collection procedures, and data analysis.

This study replicated research and analysis on the perceptions of the internship experience of Murray State University occupational safety and health graduates conducted in 1992 by David G. Kraemer and expanded that research per the recommendations for future research made by Kraemer (1992). Recommendations made by Kraemer addressed in this research study include the following:

1. Use a larger population of occupational safety and health interns to allow for more generalizability of future study results;
2. Conduct similar studies at the same and different universities that have Accreditation Board for Engineering and Technology (ABET) accredited occupational safety and health programs;
3. Conduct research on past and future occupational safety and health interns to allow for comparisons to determine if changes in perception of the internship experience occurred as a result of curriculum and preparation changes;
4. Revise the Internship Survey Questionnaire based on the finding of the Kraemer study; and
5. Conduct qualitative studies with occupational safety and health interns to assess strengths and weaknesses of the internship program.

Research Design

Research in education since the early 1900s has been dominated by the use of quantitative methodology. This approach, based on scientific empiricism, used mathematical analysis to establish general principles. Gradual recognition of the differences between scientific and educational research has led to increasing interest in a qualitative approach (Denzin & Lincoln, 1998). However, Coll and Chapman (2000) proposed that the choice of research methodology in cooperative education be driven by the research questions or objectives, rather than by a researcher's preference for a given methodology.

Quantitative research inquiry affords greater confidence in the generalization of the research findings while a qualitative approach is more useful when the researcher

wants to ascertain subjective views or perceptions and when greater depth of inquiry is required (Coll & Chapman, 2000). The results of the current study were generalizable to the internship experience of future graduates of ABET accredited programs in occupational safety and health while also addressed recent graduate perceptions of the characteristics of the internship that resulted in perceived value of and satisfaction with their internship experience.

Educational research differs from scientific research in that it has multiple purposes, being interested in both processes as well as outcome. This was the case with the current research in that the focus was on processes and characteristics of an effective internship experience as they relate to student outcomes in the areas of personal, professional, and career development. The current analysis of impact assessment of the occupational safety and health internship and implied explanations represents a broad range of inquiry which, according to Coll and Chapman (2000), could most efficiently be achieved by a combination research method.

Furthermore, Coll and Chapman (2000) recognized that the quantitative and qualitative research approaches complement and build upon each other. In addition, data triangulation, the gathering of data from different sources through convergence, affords more confidence in the interpretation of the data (Denzin & Lincoln, 1998). "The use of a combined methodological approach is clearly challenging for researchers, including co-op researchers, but this strategy is gradually gaining momentum in education and science education research" (Coll & Chapman, 2000, p. 28).

To effectively carry out Kraemer's above listed recommendations for future research, the current study was designed as a combined quantitative and qualitative

research approach. This combination of the quantitative and qualitative paradigms should provided better understanding in the analysis of perceptions of the value and satisfaction associated with the occupational safety and health internship experience. As recommended by Gliner and Morgan (2000), this research problem is well grounded in empirical and theoretical literature and has a solid conceptual as well as a practical base.

This research filled a gap in the literature relative to the perceived student value of the occupational safety and health experiential learning process that is of current importance to the ABET accreditation process for these programs. In addition, the findings of this study have the potential of testing well-established student development theory relative to experiential learning. The instrument used in this study provided for collection of data that answer the research questions with the empirical methods discussed later in this chapter.

Kraemer selected an ex post facto survey research design for the original study. According to Fraenkel and Wallen (1996), “survey research is one of the most common forms of research engaged in by educational researchers. It involves researchers asking a large group of people questions about a particular topic or issue” (p. 366). The major purpose of survey research is to describe the characteristics of a given population through a carefully selected sample of that population. A description of the population is then inferred from the sample. Ex post facto (non-experimental) research is that in which the independent variable or variables have already occurred. The researcher then observes a dependent variable or variables to study the correlation between independent and dependent variables. The independent variables are studied in retrospect to determine the relationship between these variables (Kraemer, 1992).

Kraemer (1992) noted that “the survey research design is a popular technique for collecting data in the occupational safety and health profession for many reasons. It provides beneficial data concerning the nature of phenomena. It also allows data to be collected from a large number of people in a short period of time” (p. 78). The survey approach provides for all research subjects to be exposed to the same instrument at a minimal cost and in a relatively short time frame (Fraenkel & Wallen, 1996).

The primary deficiencies of a survey research design are the absence of researcher control over independent variables and insufficient data concerning other events and variables that could have influenced the studied variables that were occurring at the time of study (Gliner & Morgan, 2000). However, mailed surveys have several advantages as well as some disadvantages. Some of the more important advantages are that researchers obtain information from a large sample of a population, money and time are conserved, anonymity is assured, and these surveys encourage responses to sensitive topics (Fraenkel & Wallen, 1996).

The disadvantages of mailed questionnaires include limited flexibility, possibility of unanswered questions, lower response rate in contrast to interviews, inability to record reactions and nonverbal responses, absence of researcher control of environmental issues, lack of control of responses, and inability to use complex questions (Fraenkel & Wallen, 1996). Considering both the strengths and weaknesses of the survey research method, it was deemed appropriate to this study.

There are several purposes of survey research in education (Isaac & Michael, 1985; Van Dalen, 1979; Fraenkel & Wallen, 1996). These purposes include describing the characteristics of a population, gathering specific information which describes an

existing condition, identifying areas of difficulty, verifying current practices, making comparisons and evaluations, and producing evidence on which to base future plans and decisions. All of these stated purposes were applicable to replication of the Kraemer study of the perceptions on an internship experience of recent college graduates in ABET accredited occupational safety and health programs. In addition to determining the current demographics and perceived values and satisfactions with the internship experience and the key characteristics of those internships, the results of the current study were compared with the original Kraemer study to determine if changes in perceptions of the internship experience have occurred. If significant changes in perceptions are found, additional research should be conducted to determine if these changes are a result of curriculum and preparation changes made since the original Kraemer study was conducted.

The survey questionnaire was analyzed primarily in the quantitative paradigm using descriptive, comparative, and associational research approaches to answer the research questions. However, the questionnaire was designed to collect qualitative data in addition to demographic and quantitative data. This study was a combined qualitative and quantitative research design consistent with the Creswell dominant-less dominant design model (Creswell, 1994): “In this design the researcher presents the study within a single, dominant paradigm (quantitative) with one small component of the overall study drawn from the alternative paradigm (qualitative)” (p. 177). This combined qualitative and quantitative approach provided a better understanding in the analysis of perceptions of the values and satisfactions associated with the occupational safety and health internship experience. Although qualitative data were collected by Kraemer in the

original study, analysis of that data was minimal, unsophisticated, and did not result in adequate interpretation of those qualitative data. Kraemer recommended future qualitative studies be conducted with occupational safety and health interns to assess strengths and weaknesses of the internship program. This study followed up on that recommendation.

Researcher's Perspective

The researcher's perspective on internships and other types of experiential learning was that this component of the learning experience is very valuable to most undergraduate students and is essential for some. This opinion was based on personal experience of working through a cooperative education program as an undergraduate student in an ABET accredited engineering program at one of the universities involved in this study.

The experiential learning component of my undergraduate education greatly enhanced my classroom learning, provided significant professional work experience, provided important insights into required personal and professional skills needed for success in my chosen career field, was instrumental in my personal maturity, helped me make an effective transition from student to professional engineer, and gave me a significant competitive advantage in the job market following graduation. As a result, this researcher believed there is a strong positive correlation between a quality internship/cooperative educational experience and the degree to which that experience provides personal, professional, and career value in the undergraduate educational experience in engineering-related studies such as occupational safety and health.

Research Questions

The following research questions served to provide direction for and were addressed in this study:

1. What is the demographic profile of students participating in an ABET accredited internship program as determined by the internship survey questionnaire for graduates?
2. What is the perceived degree to which the occupational safety and health internship experience provided personal value as determined by the internship survey questionnaire for graduates?
3. What is the perceived degree to which the occupational safety and health internship experience provided professional value as determined by the internship survey questionnaire for graduates?
4. What is the perceived degree to which the occupational safety and health internship experience provided career value as determined by the internship survey questionnaire for graduates?
5. What is the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?
6. What is the perceived level of importance placed on selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?

7. What is the perceived level of satisfaction with selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?
8. Is there a difference between female and male students' perception of the importance of the internship experience as determined by the internship survey questionnaire for graduates?
9. Is there a difference between male and female students in regard to internship salary, bachelor's degree grade point average, and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?
10. Is there a difference between student's internship primary duties and the internship site location and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?
11. Is there a difference between internship site industry or the number of employees at the internship site and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?
12. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that

- predicts personal, professional, and career value of the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?
13. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts the perceived degree of satisfaction with the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?
14. What are the major sources of value and satisfaction, or dissatisfaction, from the internship experience as determined by the internship survey questionnaire for graduates?

Participants and Site

As explained by Gliner and Morgan (2000), sampling is the process of selecting part of a larger group of participants with the intent of generalizing from the smaller group, the sample, to the larger group, the population. Participants in the 1992 Kraemer study were all graduates of Murray State University in Murray, Kentucky. Although Murray State offers an ABET accredited occupational safety and health program, Kraemer's first recommendation for future research was to conduct his study on a larger population of ABET accredited occupational safety interns to allow for more generalizability of the research findings. This study satisfied that recommendation by extending the Kraemer study to all five universities that offer an ABET accredited degree programs in occupational safety and health at the bachelor and/or the master degree level. These universities are Indiana University of Pennsylvania, Marshall University,

Millersville University of Pennsylvania, Murray State University, and West Virginia University. Each of these universities saw value in the current research and agreed to participate in this study.

With the support of the above universities, the accessible population or sampling frame were all recent graduates of ABET accredited degree programs in occupational safety and health in the USA. The selected sample was the smaller group of participants who were selected from the larger accessible population by the researcher and asked to participate in the study (Gliner & Morgan, 2000). Gliner and Morgan (2000) recognized that in some cases, the accessible population is so small and/or so narrowly defined that it is not necessary to select a sample from the accessible population. Rather, every participant in the accessible population is asked to participate in the study. With only five universities offering ABET accredited degree programs in occupational safety and health, the researcher used the entire accessible population as participants in the current study. The actual sample was the participants who completed the study and whose data were actually used in the data analysis and in the report of the study's results (Gliner & Morgan, 2000).

An important aspect of the research validity of this study was the external validity, an aspect of research validity that depends in part on the quality of the sample. External validity was defined by Campbell and Stanley in 1966 as follows (as cited in Gliner & Morgan, 2000): "External validity asks the question of generalizability: To what populations, settings, treatment variables, and measurement variables can this effect be generalized?" (p. 158). Gliner and Morgan (2000) noted that when dealing with the external validity of a study that a good study should be rated high on external validity or,

if not, the author should be cautious about generalizing the study findings. Gliner and Morgan (2000) identified two aspects of external validity, population external validity and ecological external validity. Following is the researcher's evaluation of external validity based on the Gliner and Morgan criteria.

Population External Validity

The theoretical population for this study was all bachelor's and master's degree graduates of ABET accredited programs in occupational safety and health from 1997 through 2001. Due to the limited number of graduates from ABET accredited programs in occupational safety and health and the research support of universities offering these programs, the accessible population for this study was the same as the theoretical population. As a result of the accessible population being relatively small and narrowly defined, it was not necessary to select a sample from this accessible population (Gliner & Morgan, 2000). Therefore, the selected sample was the theoretical population of all recent bachelor's and master's degree graduates of ABET accredited degree programs in occupational safety and health.

The actual sample was estimated at a minimum of 40 percent of the selected sample who are expected to respond to the survey questionnaire. This represents the minimal acceptable response rate for this study (McMillen & Schumacher, 1997). With an acceptable response rate and the selected sample being the entire theoretical population, the overall population external validity rating of the representativeness of the actual sample to the theoretical population was high.

Ecological External Validity

The setting was fairly natural, the participant's home, for responding to a questionnaire. Rapport between researcher and participant in a mailed survey questionnaire is normally low and is a factor in the anticipated low response rate. However, in addition to the pre-survey post card and the letter of introduction sent with the survey questionnaire, follow-up post cards and phone calls enhanced the response rate. This process was used in the original Kraemer study and resulted in an 83 percent response rate. The current study resulted in a 42.5 percent return rate.

A Likert-type scale questionnaire is a common student perception-rating tool with which recent college graduates should be comfortable. The survey is unobtrusive and should be ecologically valid. Appropriateness of timing and length of treatment, as used by Gliner and Morgan (2000), apply only to experimental research. Since this is an ex-post facto study, this aspect of ecological validity did not apply to this study.

The findings of this study were based on analysis of student perceptions of value and satisfaction of an internship experience from an ABET accredited occupational safety and health related degree program. ABET criteria for approval of internships as a component of the learning experience are expected to remain stable. Therefore, results of this study should not be restricted to a specific time in history and are generalizable to future graduates of ABET accredited programs. Based on the Gliner and Morgan (2000) criteria, the overall rating for ecological external validity of this study was medium to high.

The other aspect of research validity, the validity or quality of a whole study, is that of internal validity. Cook and Campbell (as cited by Gliner & Morgan, 2000)

defined internal validity as the approximate validity with which one can infer a relationship is causal: “Internal validity depends on the strength of the research design and influences whether one can conclude that the independent variable caused the dependent variable to change” (p. 83). Gliner and Morgan (2000) have incorporated Cook and Campbell’s threats to internal validity and grouped these threats into two main types: equivalence of groups on participant characteristics and control of extraneous experiences and environment variables.

According to Gliner and Morgan (2000), the best way to assure equivalence of groups is through random assignment of participants to groups before the intervention, or independent variable, is applied. Likewise, control of extraneous experiences and the environment is better for randomized experiments and for studies done in controlled environments like laboratories. This approach is not consistent with a survey questionnaire research design. Gliner and Morgan (2000) also noted that internal validity is often discussed only with respect to randomized and quasi-experiments that satisfy the above criteria. However, Gliner and Morgan believed that the concept of internal validity also applies to the comparative and associational research approaches on which this study was based. Therefore, this researcher evaluated this study on the guidelines established for threats to internal validity established by Gliner and Morgan.

Equivalence of Groups on Participant Characteristics

Based on the Gliner and Morgan (2000) criteria, equivalence of groups was rated as low to medium because the researcher had no control of participants or groups. However, all participants were recent (1997 – 2001) bachelor’s or master’s degree graduates of ABET accredited universities offering occupational safety and health-related

programs. Even so, differences are likely to exist as a result of the demographic of the participants and the time frame over which the data were collected and compared. As a result of this low to medium rating, the researcher looked for relationships between the independent and dependent variables but did not infer that the independent variables caused any differences or change in the dependent variables.

Control of Extraneous Experience/Environmental Variables

There appears to be little reason to think that extraneous events could affect one group more than another--male versus female participants. Considering the survey instrument was a mail questionnaire to the participant's home address, it is likely that extraneous variables were not controlled. Therefore, the researcher rated the control of extraneous experience and environmental variables as low. Again, the researcher looked for relationships between the independent and dependent variables but did not infer that the independent variables caused any differences or change in the dependent variables.

Measures

A variable is defined as a "characteristic of the participants or a situation in a given study that has different values in the study. In quantitative research, variables are defined operationally and are commonly divided into independent variables (active or attribute), dependent variables, and extraneous variables" (Gliner & Morgan, 2000, p. 48). An operational definition describes a variable as to how it is used or the techniques used to measure it. The variables selected for this study consisted of 14 attribute independent (predictor) variables and five dependent (criterion) variables.

Independent Variables

The independent variables in this study were not active or manipulated variables.

Rather these independent variables were attribute independent variables. The values of these variables were an attribute of the participant in the study. Examples of participant attributes include gender, age, ethnic group, or other characteristic of the participant. According to Gliner and Morgan (2000), “although experimental psychologists consider attribute independent variables as nuisance variables and attempt to control these variables, attribute independent variables are of substantive interest in educational research” (p. 50).

The independent variables in this study were selected by Kraemer after a review of the literature. The 14 independent variables were derived from the following characteristics identified on the survey questionnaire (Kraemer, 1992). All of these variables are attribute independent variables and are identified in Part I-Demographic Data and Internship Information on the survey instrument. The specific survey question number is listed with the variable name. The number of levels for each variable is listed with the corresponding level of measurement. These characteristics were important to selection of the appropriate descriptive, comparative, or associational statistics for analysis. Following is a description of the 14 attribute independent variables:

Independent Variable:	Levels:	Level of Measurement:
1. Gender (q. 1)	2	Dichotomous
2. Race (q. 2)	6	Nominal
3. Degree received (q. 3)	2	Nominal
4. Grade point average (q. 4)	4 many	Nominal Scale
5. Age (q. 5)	many	Scale
6. Marital status (q. 6)	3	Nominal

7. Year internship performed (q. 7)	many	Nominal
8. Classification (q. 8)	4	Nominal
9. Type of Industry Site (q. 9)	9	Nominal
10. Responsibilities/Duties (q. 10)	4	Nominal
11. Geographical area (q. 11)	4	Nominal
12. Number of employees (q. 12)	many	Scale
13. Salary compensation (q. 13)	many	Scale
14. Full-time job offer (q. 14)	2	Dichotomous

Dependent Variables

The dependent variable was the outcome or criterion variable. This variable was assumed to measure or assess the effect of the independent variable (Gliner & Morgan, 2000). The five dependent variables in this study were measured on several summated five-point Likert scale questions in Part II of the survey questionnaire. These data were considered to be scale data for analytical purposes. The dependent variables are described below with the corresponding survey questionnaire items to measure each variable given in the parentheses.

Dependent variable:

1. Degree to which the occupational safety and health internship experience provided personal value (Part II, Section C, q. 51, 52, 53, 54 summed);
2. Degree to which the occupational safety and health internship experience provided professional value (Part II, Section C, q. 55, 56, 57, 58, 59 summed);
3. Degree to which the occupational safety and health internship experience provided career value (Part II, Section C, q. 60, 61, 62 summed);

4. Level of importance placed on selected characteristics of the occupational safety and health internship experience (Part II, Section A, q. 15 – 32 summed); and
5. Extent of satisfaction of selected characteristics related to the internship experience (Part II, Section B, q. 33 – 50 summed).

Research Instrument

There are many techniques and instruments used to collect data that range from researcher reported measures to self-reported measures. Observer reported data are assumed to be less influenced by the participants' desire to look good or to answer in a socially desirable way. Self-reported data by the study participants are clearly filtered through the participants' eyes and are probably influenced by factors such as social desirability and answering in what is perceived as an acceptable way. This concern about the filtering of participants' answers has led quantitative researchers to be suspicious about the validity and the reliability of self-report instruments (Gliner & Morgan, 2000). "In general, it is advisable to select instruments that have been used in other studies if they have been shown to be reliable and valid with the types of participants and for the purpose that you have in mind" (Gliner & Morgan, 2000, p. 332). This was the case in the current study using a survey instrument which has been shown to be reliable and valid in the 1992 Kraemer study of occupational safety and health graduates.

In support of Kraemer's selection of the survey research method, McMillen and Schumacher (1997) noted that "the questionnaire is the most widely used technique for obtaining information from subjects. A questionnaire is relatively economical, has the same questions for all subjects, can ensure anonymity, and contains questions written for

specific purposes” (p. 252). Gliner and Morgan (2000) observed that “questionnaires are usually developed by an investigator for one-time use in a particular study on a specific topic. However, some questionnaires are used in several studies to assess the same issue at different times” (p. 334). This was clearly the intent of the Kraemer study in 1992 when the researcher made the recommendation to conduct the original study on a larger population of occupational safety and health interns to allow for more generalizability of future study results (Kraemer, 1992).

The research instrument in this study (see Appendix A, Internship Survey Questionnaire) was the original Kraemer 66-item questionnaire that has been modified to eliminate unnecessary duplication as per Kraemer’s recommendations for future research (Kraemer, 1992). Permission to use this research instrument was given by the author (see Appendix B, Letter of Permission). This survey instrument is based on Kraemer’s extensive literature review coupled with his review of several existing survey questionnaires. After the instrument was developed, Kraemer tested the questionnaire for readability, validity, and reliability. The issues of validity and reliability will be discussed in detail in the section on validity and reliability to follow.

The 66-item questionnaire was divided into two parts. Part I was the demographic data and internship information section containing 14 items. Part II, Internship Perceptions, was originally divided into five sections, A-E. However, the original Part II, Section B was eliminated, per Kraemer’s recommendations for future research, as it was found to be redundant with information provided in Part II, Section A. The first three sections of the revised questionnaire, A-C, dealt with graduates’ perceptions of their internship experience based on questions with closed-ended, forced

responses. Section A pertained to characteristics of a worthwhile occupational safety and health internship program. Section B pertained to the level of satisfaction with these characteristics of the internship experience, and Section C pertained to the personal, professional, and career value of the internship experience. Section D of the survey instrument dealt with open-ended questions designed for qualitative analysis.

Part II, Sections A, B, and C of the internship survey questionnaire were constructed using a five-point Likert-type scale to force participants to select a response from listed alternatives. The responses were measured on the participant's stated degree of importance (Section A), satisfaction (Section B), and agreement (Section C) regarding given factors on the Likert-type scale. The range of the scale was "very unimportant" represented by 1 to "very important" represented by 5 for Section A, "very dissatisfied" represented by 1 to "very satisfied" represented by 5 for Section B, and "strongly disagree" represented by 1 to "strongly agree" represented by 5 for Section C. The total summed value in Section B ranged from 18 (low) to 90 (high) points. The statements in Section C were subdivided into the following groups: personal, professional, and career value. The point values of each of the groups were as follows: personal value, 4 (low) to 20 (high) points; professional value, 5 (low) to 25 (high) points; career value, 3 (low) to 15 (high) points. The total summed value in Section C ranged from 12 (low) to 60 (high) points.

By design, the closed-ended, forced response type of questionnaire does not allow respondents to communicate opinions about areas which were not covered by the responses or were not appropriate for a particular respondent. To overcome this limitation, a space for "Additional Comments" was included at the end of Part II of the

survey questionnaire (Kraemer, 1992). To overcome the limitations imposed by the questionnaire's forced responses, four open-ended questions were constructed for Part II, Section D. These questions allowed for personal freedom of responses and qualitative analysis of the occupational safety and health internship experience. A discussion follows on the validity and reliability of the internship survey questionnaire.

Validity and Reliability

The validity and reliability of the internship survey questionnaire were evaluated based on the validity and reliability components of the Analysis and Evaluation of Quantitative Research Studies (Table 24.1) of the Gliner and Morgan text, *Research Methods in Applied Settings* (Gliner & Morgan, 2000). Following are the researcher's evaluation of the validity of the measure and reliability of the measure provided by this survey questionnaire.

Validity of the Measure

Based on the Kraemer (1992) dissertation acceptance at the University of Southern Illinois, the Kraemer Internship Survey Questionnaire has face validity in that this survey instrument appeared to be appropriate for measuring interns' perception of value and satisfaction of the occupational safety and health internship experience. This evaluation of face validity is consistent with criteria for face validity established by Gliner and Morgan (2000).

Content validity of the Kraemer instrument was based on an extensive literature search that established the concepts that Kraemer was attempting to measure. The actual questionnaire items were a composite of his research findings. Kraemer then established a panel of experts to review the items for representativeness of the concepts of

importance, value, and satisfaction of an internship experience in occupational safety and health. The panel was made up of individuals with professional expertise in occupational safety and health and internship/cooperative education programs. The expert panel evaluation forms were compared for consensus and several changes were made to the questionnaire. As a result of this process, this researcher rated the content validity of the Kraemer survey instrument as high.

The Kraemer survey instrument has been further refined by this researcher to incorporate recommendations for future research that came out of the Kraemer dissertation. This process of continuing experimentation and modification of the Kraemer instrument led to refinement of this questionnaire and improved construct validity. This researcher rated the overall validity of measurement of the Internship Survey Questionnaire for evaluation of occupational safety and health internships as high.

Reliability of the Measure

The reliability of the questionnaire used in this study was rated medium-high based on the fact that the instrument was accepted and used for a dissertation ten years ago and based on the following test results. As evidence of reliability, the Kraemer instrument was successfully pilot tested prior to implementation and administration of the internship survey questionnaire in the original study. Dr. Kraemer determined the internal consistency of the instrument using Cronbach alpha for both the pilot study (N=21) and the actual study sample (N=173). The summed scales in the Internship Survey Questionnaire for personal, professional, and career value of the internship experience was $\alpha=.8116$ in the pilot study and $\alpha=.8459$ in the actual study. Slightly lower value alphas were listed for the subscales for personal, professional, and career values of

the internship experience. However, all of the results indicated acceptable Cronbach alpha levels to verify the survey instrument's reliability of the measure.

The Cronbach alpha is an appropriate method to determine internal reliability for an instrument using a Likert scale (Hinkle, Wiersma & Jurs, 1998). Based on examination of the questionnaire, the researcher believed that only one construct is being measured in each of the summed scales and subscales in the internship survey questionnaire. As an additional test for reliability, the researcher replicated the Cronbach alpha measurement on the actual survey sample in the current study.

Human Subjects

McMillan and Schumacher (1997), recognized that the "knowledge acquired through research is limited by the nature of both educational practice and research. Educational research is constrained by ethical and legal considerations in conducting research on human beings" (p. 25). Since educational research focuses primarily on human beings, it is the researcher's ethical responsibility for protecting the rights and welfare of the subjects while conducting a study (McMillan & Schumacher, 1997).

Before initiating this study, an application requesting permission to conduct the research was submitted to the Colorado State University Human Research Committee. Permission was granted to conduct this research on January 9, 2002 (See Appendix C, Human Subjects Approval). Permission to survey graduates of ABET accredited occupational safety and health degree programs was requested and received from each university. Universities which housed these ABET accredited degree programs were Indiana University of Pennsylvania, Marshall University, Millersville University of Pennsylvania, Murray State University, and West Virginia University.

Data Collection Procedures

Data were collected by mailing the internship survey questionnaire to the selected population. First, a post card explaining the purpose and importance of the survey questionnaire was mailed to all participants inviting them to participate in the study. One week after the initial post card was mailed, a cover letter, the internship survey questionnaire, directions, general information, a postage-paid return envelope, and response verification card were mailed to the selected population (See Appendix D, Mailed Survey Materials).

Completed survey forms were requested to be returned in the self-addressed stamped envelopes within five working days from the receipt of the questionnaire. Participants were asked to mail the postage-paid response verification cards indicating that they had completed and mailed the unsigned survey questionnaire separately from the questionnaires. Two weeks later, a follow-up post card was sent as a reminder requesting those who had not completed the survey to please do so. The final follow-up was a telephone call to non-respondents. This procedure replicated the procedure used by Kraemer in 1992 and was recommended by McMillan and Schumacher (1997). It allowed the researcher to check on reasons for non-response such as questionnaires that never reached the respondent, incorrect addresses, or other concerns that the respondent may have.

The above data collection procedures were used very successfully in the original study (Kraemer, 1992). A response rate of 40 to 60 percent is typical for a mailed questionnaire (McMillan & Schumacher, 1997). McMillan and Schumacher noted that a response rate of 70 percent or better is obtainable using the above described data

collection procedures (1997). In the Kraemer study, using these procedures, the response rate was 83 percent. Of the 173 questionnaires returned, all were usable in the Kramer study (1992). The required minimum of a 40 percent response rate was usable in this survey research study.

Data Analysis Procedures

Quantitative statistical methods were used to analyze items in Part I, q. 1 –14, and Part II, q. 15 - 62 on the internship survey questionnaire relative to the first 13 research questions. Qualitative analytical methods were applied to the remaining four open-ended research questions, Part II, q. 63-66, and the additional comments section of the internship survey questionnaire to address research question 14.

Quantitative Statistical Analysis

Descriptive statistics procedures were used to analyze and describe the general univariate patterns of the data in Part I, q. 1-14. These statistics were used to assess and describe a demographic profile of the study participants and key characteristics of the internship experience. This was accomplished by compiling and analyzing the demographic characteristics in terms of percentages, frequencies, ranges, means, and standard deviations. Demographic data and internship information were categorized, coded, analyzed, and reported in tables to determine what internship characteristics add greatest value to the internship experience.

The bivariate patterns of the data were measured by the Pearson product moment correlation coefficient (r) which allows comparison of the strength and direction of relationship between different pairs of scale independent and dependent variables. Independent samples t tests and single factor, or one-way, analysis of variance (ANOVA)

with Fisher LSD post hoc tests were used to look at differences between the various demographic and internship information variables. ANOVA and Fisher LSD post hoc tests were also used to compare selected variables of the internship experience and the mean degree to which the occupational safety and health internship provided personal, professional, and career value.

The bivariate statistical correlation procedure is commonly utilized when the researcher is interested in the relationship between two sets of variables (Hinkle et al., 1998). As noted by Hinkle et al. (1998), the most commonly used correlation coefficient in the behavioral sciences is the Pearson product moment correlation coefficient symbolized by (r). The correlation coefficients are used to determine the strength and direction of the relationship between two variables. The computed value of the correlation coefficient can range from -1.0 to $+1.0$ inclusively. The direction of the relationship is indicated by the sign of the coefficient, while the absolute value of the coefficient gives an indication of the magnitude or strength of the relationship. The Pearson product moment correlation coefficient requires at least interval scale measurement because the means and variances of the distributions must be computed (Hinkle et al., 1998). In this study, grade point average, age, salary, and number of employees at the internship facility, value of, importance of, and satisfaction with the internship experience met this criterion for scale measurement.

The analysis of variance (ANOVA) procedure is an inferential statistic that is commonly used to determine if the means of two or more groups are different (McMillan & Schumacher 1997). From the earlier discussions on types of variables, "changes in the dependent variable are, or are presumed to be, the result of changes in the independent

variable” (Hinkle et al., 1998, p. 348). One-way ANOVA was applied to the dependent variables of mean level of satisfaction and mean level of personal, professional, and career value of the internship experience. The independent variables in these analyses included gender, degree received, overall grade point average, marital status, type of internship site, responsibility/duties, and geographical area. The review of literature indicated that an alpha level of .05 is commonly found acceptable in contemporary occupational safety and health studies (Kraemer, 1992; McMillian & Shumacher, 1997; Gliner & Morgan, 2000).

Hinkle et al. (1998), identified multiple linear regression as an inferential statistical method that determines the degree of the relationship between a single criterion variable (dependent variable) with multiple predictor variables (independent variables):. “These predictor variables are combined into an equation, called the multiple regression equation which can be used to predict scores on the criterion variable from scores on the predictor variables” (p. 480). Separate multiple linear regression analyses were conducted on the criterion/dependent variables: the degree to which the internship experience provided summed personal professional, and career value, and the perceived level of satisfaction of the internship experience. The independent variables gender, age, number of employees, salary, responsibility/duties, and internship sites were used as the predictor variables in these analyses.

Qualitative Research Analysis

The data obtained from the open-ended response questions, 62 – 66, and the additional comments section of the internship survey questionnaire were evaluated using a qualitative research analysis method. This qualitative analysis was accomplished using

constant comparative analysis of the data collected (Creswell, 1994; McMillan & Schumacher, 1997; Miles & Huberman, 1994). The comments from the following open-ended questions were categorized, grouped, and summarized: What did you like best about your internship experience? What did you like least about your internship experience? What would you do differently about your internship experience if given the choice to do it over? What key insights would you share with an occupational safety and health student who is pursuing an internship experience? What additional comments would you share?

In this qualitative analysis, the qualitative survey questionnaire data from the above questions were used to determine the occupational safety and health internship characteristics that were most and least significant in providing value of and satisfaction with the internship experience. Open, axial, and selective coding of the data were coupled with computer assisted analysis to develop an inductive understanding of the student perceptions of their experiential learning component of their education (Creswell, 1998; Miles & Huberman, 1994; Glaser & Strauss, 1967).

Glaser and Strauss (1967) developed the inductive qualitative data analysis process called constant comparison or constant comparative analysis. This data analysis concept refers to the process by which data are ordered into primary categories and coded as open or first level codes according to their conceptual context. The open coded content is then constantly compared with each other to establish the axial or second level codes that hold a group of open codes together. The second level codes are more abstract and organize the open or first level codes. The axial codes form the major categories that induce the conceptual relationships among the categories which are referred to as

selective code or core category. This selective coding classifies the second level coding for the purpose of finding the major constructs of themes that allow the data to speak to the major research questions of the study (J.H. Banning, personal communication, October 12, 2001). This qualitative data analysis provided information and insight which was not addressed in the quantitative data analysis portion of the survey questionnaire.

Design and Analysis of Each Research Question

The plan for analysis for each research question is summarized in Table 1. As indicated, the survey questionnaire was analyzed primarily in the quantitative paradigm using descriptive, comparative, associational, and complex associational research approaches, as appropriate, to answer the research questions (Gliner & Morgan, 2000). However, the survey questionnaire was also designed to collect qualitative data in addition to demographic and quantitative data. The first seven research questions were descriptive in nature, and statistics used to address these questions included descriptive tables and frequency distributions. Questions eight through eleven were difference questions, and the statistics used to address these questions were comparative statistics to include independent t-test and one-way ANOVA with a Fisher LSD post hoc test for $\text{sig} < .05$. Questions twelve and thirteen were complex associational and required multiple linear regression analysis. Question fourteen was addressed from a qualitative research standpoint using constant comparative analysis of the open-ended survey questionnaire data.

Table 1

Summary of Data Analysis

	Research Question	Questionnaire Items	Data Treatment
1.	What is the demographic profile of students participating in an ABET accredited internship program as determined by the internship survey questionnaire for graduates?	Part I, Survey Questions 1-14	Descriptive Statistics, Frequency Distributions
2.	What is the perceived degree to which the OSH internship experience provided personal value as determined by the internship survey questionnaire for graduates?	Part II, Section C, Survey Questions 51-54	Descriptive Statistics, Frequency Distributions
3.	What is the perceived degree to which the OSH internship experience provided professional value as determined by the internship survey questionnaire for graduates?	Part II, Section C, Survey Questions 55-59	Descriptive Statistics, Frequency Distributions
4.	What is the perceived degree to which the OSH internship experience provided career value as determined by the internship survey questionnaire for graduates?	Part II, Section C, Survey Questions 60-62	Descriptive Statistics, Frequency Distributions
5.	What is the perceived degree to which the OSH internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?	Part II, Section C, Survey Questions 51-62	Descriptive Statistics, Frequency Distributions
6.	What is the perceived level of importance placed on selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?	Part II, Section A, Survey Questions 15-32	Descriptive Statistics, Frequency Distributions
7.	What is the perceived level of satisfaction with selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?	Part II, Section B, Survey Questions 33-50	Descriptive Statistics, Frequency Distributions
8.	Is there a difference between female and male students' perception of the importance of the internship experience as determined by the internship survey questionnaire for graduates?	Part I, Survey Question 1 Part II, Section A, Survey Questions 15-32	Independent Samples t-test

(table continued)

(Table 1 continued)

Research Question	Questionnaire Items	Data Treatment
9. Is there a difference between female and male students in regard to internship salary, bachelor's degree grade point average, and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?	Part I, Survey Questions 1, 4 & 13 Part II, Section C, Survey Questions 51-62	Independent Samples t-test
10. Is there a difference between student's internship primary duties and the internship site location and the perceived degree to which the internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?	Part I, Survey Question 10 Part II, Section C, Survey Questions 51-62	One-Way ANOVA and Fisher LSD for sig < .05
11. Is there a difference between internship site industry or a relationship between the number of employees at the internship site and the perceived degree to which the internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?	Part I, Survey Questions 9 & 12 Part II, Section C, Survey Questions 51-62	One-Way ANOVA and Fisher LSD for sig < .05 Pearson Correlation
12. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts personal, professional, and career value of the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?	Part I, Survey Questions 1, 4, 5, 12, 13, & 14 Part II, Section C, Survey Questions 51-62	Multiple Linear Regression
13. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts perceived satisfaction with the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?	Part I, Survey Questions 1, 4, 5, 12, 13, & 14 Part II, Section C, Survey Questions 33-50	Multiple Linear Regression
14. What are the major sources of value and satisfaction, or dissatisfaction, from the internship experience as determined by the internship survey questionnaire for graduates?	Part II, Section D, Survey Questions 63-66 and the Additional Comments.	Qualitative Analysis using Constant Comparative Analysis.

All quantitative data was hand-coded and checked for coding errors by comparing the raw data on the computer printout with the original questionnaire. Descriptive

analysis, Pearson correlation coefficient, independent t-test, One-way ANOVA, Fisher LSD, and multiple linear regression were executed on the Colorado State University Statistics Laboratory computing system using the Statistical Products and Service Solutions (SPSS) for Unix, Release 6.1 software. Tables are used to present the demographic and internship characteristics along with a profile of the participants.

Summary

This chapter discussed the methods used in this research study to include: research design, participants and site, measures, validity and reliability, human subjects, data collection procedures, and data analysis procedures. The chapter contained a description of the quantitative and the qualitative research methods used to accomplish the purpose of this study and address each of the 14 research questions.

This study replicated research and analysis on the perceptions of the internship experience of Murray State University occupational safety and health graduates done in 1992 by David G. Kraemer and expanded that research by addressing five of the nine recommendations for future research made by Kraemer (1992). The purpose of the study was to: assess the degree to which the occupational safety and health internship experience provided personal, professional, and career value and satisfaction for occupational safety and health graduates and to determine those characteristics that contribute most to a worthwhile internship experience.

To effectively carry out Kraemer's recommendations for future research, the current study was designed as a combined quantitative and qualitative research approach. This combination of the quantitative and qualitative paradigms should provide better understanding in the analysis of perceptions (Coll & Chapman, 2000) of the value and

satisfaction associated with the occupational safety and health internship experience. As recommended by Gliner and Morgan (2000), this research problem is well grounded in empirical and theoretical literature and has a solid conceptual as well as a practical base.

The survey research instrument used in this study provided for collection of data that answered the research questions with the empirical methods discussed in this chapter. The survey questionnaire was analyzed primarily in the quantitative paradigm using descriptive, comparative, and associational research approaches to answer the research questions. However, the questionnaire was designed to collect qualitative data in addition to demographic and quantitative data. Qualitative data was accomplished through constant comparative analysis (Glaser & Strauss, 1967).

The variables selected for this study consist of 14 attribute independent (predictor) variables and five dependent (criterion) variables to address the perceived personal, professional, and career value of and satisfaction with the occupational safety and health internship experience. The independent variables are identified in Part I- Demographic Data and Internship Information on the survey instrument. The five dependent variables in this study were measured on several summated five-point Likert scale questions in Part II of the survey questionnaire. These data were considered to be scale data for analytical purposes. The validity and reliability of the research instrument used in this study was established through a review of literature and the empirical research results of the original Kraemer coupled with the current research findings.

Before initiating this survey questionnaire research study, an application requesting permission to conduct the research was submitted to and permission granted from the Colorado State University Human Research Committee. Permission to survey

graduates of ABET accredited occupational safety and health degree programs was requested and received from each of the five universities offering these degree programs. These universities were Indiana University of Pennsylvania, Marshall University, Millersville University of Pennsylvania, Murray State University, and West Virginia University.

Descriptive statistics procedures were used to analyze and describe the general univariate patterns of the data in Part I of the survey questionnaire. These statistics were used to assess and describe a demographic profile of the study participants and key characteristics of the internship experience. Demographic data and internship information were categorized, coded, analyzed, and reported in tables to determine what internship characteristics add greatest value to the internship experience.

The bivariate patterns of the data were measured by the Pearson product moment correlation coefficient (r) which allows comparison of the strength and direction of relationship between different pairs of scale independent and dependent variables. Independent samples t tests and single factor analysis of variance (ANOVA) with Fisher LSD post hoc tests were used to look at differences between the various demographic and internship information variables. ANOVA and Fisher LSD post hoc tests were also used to compare selected variables of the internship experience and the mean degree to which the occupational safety and health internship provided personal, professional, and career value. In addition, separate multiple linear regression analyses were conducted on the criterion/dependent variables: the degree to which the internship experience provided summed personal professional, and career value, and the perceived level of satisfaction of the internship experience. The independent variables gender, age, number of employees,

salary, responsibility/duties, and internship sites were used as the predictor variables in these analyses.

In the qualitative analysis of data, the survey questionnaire data from the five open-ended questions were used to determine the occupational safety and health internship characteristics that were most and least significant in providing value of and satisfaction with the internship experience. Open, axial, and selective coding of the data were used to develop an inductive understanding of the student perception of their experiential learning component of their education.

Chapter IV reports the results of analysis of the quantitative and qualitative data collected from the survey questionnaires, and Chapter V includes a discussion of these results along with conclusions drawn and recommendations developed from this study. The recommendations in Chapter V should help to ensure a quality internship experiences for future students in ABET accredited occupational safety and health degree programs and provide evidence of the education value of the internship experience to support ABET accreditation of occupational safety and health degree programs under the new ABET (2001) outcomes-based accreditation criteria.

CHAPTER IV

RESULTS

In this chapter, the results of the analysis of data gathered from the Internship Survey Questionnaire are reported. The survey instrument developed by Kraemer (1992), and modified for this study, was reassessed to ensure the instrument was statistically reliable. After satisfying reliability of the measure, the demographic and internship information were analyzed and findings for each research question were reported.

In January 2002, 663 survey questionnaires were sent to all 1997 through 2001 bachelor's and master's degree graduates of five ABET accredited university programs in occupational safety and health who completed at least one internship experience. Of those questionnaires mailed out, 197 were returned by the postal service or confirmed to be incorrect addresses through follow-up telephone calls. Therefore, a total of 454 survey questionnaires were delivered; 193 were returned completed by program graduates for a 42.5 percent response rate by the cut-off date of March 30, 2002.

Of the 193 questionnaires returned by the participants, all were usable and served as the basis for this analysis. However, several of the returned surveys had an occasional missing response to one or more survey items. More than 93 percent of the questionnaires contained responses to the five open-ended questions that were used for qualitative analysis of the survey data.

Reliability of the Measurement

The reliability of the survey questionnaire research instrument used in this study was reassessed using data obtained from the study participants. Reliability of the measure refers to the internal consistency of the questionnaire and was determined using Cronbach alpha for each of the summed scales from the survey questionnaire.

The Cronbach alphas for the research study sample (N=193) were .8891 for the combined personal, professional, and career value summed scale of the internship experience (survey questions 51-62), .7429 for the personal value summed scale (survey questions 51-54), .8089 for the professional value summed scale (survey questions 55-59), .7044 for the career value scale (survey questions 60-62), .9016 for the satisfaction summed scale (survey questions 33-50), and .9161 for the importance summed scale (survey questions 15-33), see Table 2.

Table 2

Reliability of the Measure of the Occupational Safety and Health Internship Survey Questionnaire

Cronbach Alpha	
Measurement Scale	Research Sample (N=193)
Personal, Professional, Career Value	.8891
Personal Value	.7429
Professional Value	.8089
Career Value	.7044
Satisfaction	.9016
Importance	.9161

To say that the measurement is reliable, one would expect a Cronbach alpha between +.7 and +1.0 (Gliner & Morgan, 2000). The above results indicate a relatively high level of item correlation and good internal consistency of the survey instrument.

Findings From Research Questions

Research Question 1. What is the demographic profile of students participating in an ABET accredited internship program as determined by the internship survey questionnaire for graduates?

The demographic data characterizing recent graduates of the five ABET accredited university degree programs in occupational safety and health that completed at least one internship experience is summarized in Tables 2 and 3. These tables also summarize the attributes or characteristics associated with the participants internship experience. These data, characterizing the graduate and the internship experience, constitute the 14 attribute independent variables used in this analysis of graduate perception of their internship experience. Table 3 provides descriptive statistics and frequency distributions of the nominal and dichotomous attribute independent variables, and Table 4 shows the descriptive statistics and frequency distributions for the scale attribute independent variables.

While performing their first internship, the research study population was 79.2 percent male and 20.8 percent female. Over 95 percent of the population was Caucasian, and 80.7 percent were single while completing their internship experience, see Table 3. The age of the participants ranged from 19 to 48 years old while performing their internship. The mean age of the sample population was 25.13 years old ($SD = 5.29$), (see Table 4).

As reported in Table 3, 64.9 percent of the respondents in this study completed a bachelor's degree while 35.1 percent completed a master's degree in occupational safety and health from one of the five ABET accredited university degree programs. Of those participants receiving a bachelor's degree, 76.3 percent had an overall grade point average between 2.50 and 3.49 based on a 4.00 point grading scale. The master's degree participants had a higher grade point average with 74.4 percent averaging between 3.50 and 4.00 on the 4.00 point grading scale. Both bachelor's and master's degree participants were fairly evenly spread over the five-year sample period, and most of the participants (90.1 %) completed their internship experience within the last five years.

Most of the participants (68.2%) completed their first internship as an undergraduate while 31.8 percent completed their first internship as a graduate student. Most internships were completed in the summer semester (58.1%), see Table 3.

The typical internship sites were manufacturing (45.3%), other sites (university, pulp and paper, trucking, utilities, and health care) (20.3%), chemical industries (8.3%), and government agencies (8.3%). The interns' primary areas of responsibility (duties) during their first internship were generalist (66.7%), environmental health and safety (22.4%), and industrial hygiene (6.3%). The geographical locations of the internship sites were closely distributed over urban (34.4%), rural (33.9), and suburban (30.2%) areas, see Table 3. The number of employees at the various internships sites varied from five to over 10,000. The mean number of employees was 1198.54 (SD = 2189.93) (see Table 4). Most interns (67.4%) worked at what the U.S. Bureau of Labor Statistics considers to be large employer, 250 or more employees. The salary level of the interns

ranged from \$0 to \$38 per hour with a mean salary of \$10.12 per hour (SD = 6.35) (see Table 4).

Table 3

A Descriptive Profile of Demographic and Internship Characteristics of the Occupational Safety and Health Graduates who Participated in the Study (Nominal and Dichotomous Attribute Independent Variables) N=193

Independent Variable	Frequency	Percent	Missing Cases
Gender	192	100%	1
Female	40	20.8	
Male	152	79.2	
Race	192	100%	1
Asian	2	1.0	
Black/African American	5	1.6	
Caucasian	184	95.8	
Hispanic	1	0.5	
Degree Received	188	100%	5
Bachelor	122	64.9	
Master	66	35.1	0
Year B.S. Received	122	100%	5
1997	23	18.9	
1998	33	27.0	0
1999	15	12.3	
2000	25	20.5	
2001	26	21.3	
Year M.S. Received	66	100%	0
1997	8	12.1	
1998	21	31.8	
1999	12	18.2	
2000	12	18.2	
2001	13	19.7	
Grade Point Average (B.S.)	156	100%	0
3.50 – 4.00	28	17.9	
3.00 – 3.49	65	41.7	
2.50 – 2.99	54	34.6	
2.00 – 2.49	9	5.8	

(table continued)

(Table 3 continued)

Independent Variable	Frequency	Percent	Missing Cases
Grade Point Average (M.S.)	78	100%	0
3.50 – 4.00	58	74.4	
3.00 – 3.49	19	24.4	
2.50 – 2.99	1	1.3	
Marital Status, 1 st Internship	191	100%	2
Married	29	15.2	
Single	154	80.6	
Other	8	4.2	
Year of First Intern	171	100%	22
1993	10	5.8	
1994	4	2.3	
1995	5	2.9	
1996	17	9.9	
1997	28	16.4	
1998	37	21.6	
1999	28	16.4	
2000	26	15.2	
2001	16	9.4	
Semester of Internship	192	100%	1
Fall	31	16.2	
Spring	49	25.7	
Summer	111	58.1	
Class Standing, 1 st Internship	192	100%	1
Sophomore	8	4.2	
Junior	34	17.7	
Senior	89	46.4	
Graduate	61	31.8	
Type of Site Industry	192	100%	1
Chemical	16	8.3	
Construction	11	5.7	
Consulting	7	3.6	
Food	8	4.2	
Government	16	8.3	
Insurance	1	0.5	
Manufacturing	87	45.3	
Mining	7	3.6	
Other	39	20.3	

(table continued)

(Table 3 continued)

Independent Variable	Frequency	Percent	Missing Cases
Area of Responsibility (duties)	192	100%	1
Env Health & Safety	43	22.4	
Industrial Hygiene	12	6.3	
Safety Generalist	128	66.7	
Other	9	4.7	
Geographical Location	192	100%	1
Rural	65	33.9	
Suburban	58	30.2	
Urban	66	34.4	
Other	3	1.6	
Job Offer	192	100%	1
No	119	62	
Yes	73	38	
Accept Job Offer	73	100%	0
No	25	34.2	
Yes	48	65.8	

Table 4

A Descriptive Profile of Demographic and Internship Characteristics of the Occupational Safety and Health Graduates Who Participated in the Study (Scale Attribute Independent Variables) N=193

Independent Variable	N	Missing	Mean	Std. Dev.	Value	
					Min	Max
Age	188	5	25.13	5.29	19	48
Number of Employees	190	3	1198.54	2189.93	5	9999(+)
Salary (\$/hour)	186	7	10.12	6.35	0	38

As reported in Table 3, 73 of the 192 interns responding were offered full-time employment following their internship experience. Of this group, 48 (65.8%) accepted and 25 (34.2%) rejected the offer (see Table 3).

Research Question 2. What is the perceived degree to which the occupational safety and health internship experience provided personal value as determined by the internship survey questionnaire for graduates?

As reported in Table 5, the mean score for the perceived degree to which the internship experience provided personal value was 4.11 (SD = .88) on a five-point Likert-type scale. This five-point scale ranged from 1 = strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, and 5 = strongly agree with the personal value of the internship. Of the 192 respondents, 152 (79.2 %) rated the internship a 4 or 5 indicating moderate to strong agreement that the internship provided personal value. Strongest agreement (4.25) occurred relative to the importance of the internship clearly indicating how important basic communication (speaking and writing) skills are to success of the safety professional. Lowest agreement (3.98) occurred relative to the internship helping to better understand one's self, personal interests, and personal goals. This score indicated neither agreement nor disagreement to moderate agreement that the internship helped the student better understand him or herself.

Research Question 3. What is the perceived degree to which the occupational safety and health internship experience provided professional value as determined by the internship survey questionnaire for graduates?

The mean score for the perceived degree to which the internship experience provided professional value was 4.19 (SD = .90) on a five-point Likert-type scale with 1

= strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, and 5 = strongly agree with the professional value of the internship, see Table 5. Of the 192 respondents, 157 (81.8 %) rated the internship a 4 or 5 indicating moderate to strong agreement that the internship provided professional value. Strongest agreement (4.45) occurred relative to the internship providing a positive educational experience. Lowest agreement (3.97) occurred relative to classes becoming more relevant after completing the internship experience. This score indicated neither agreement nor disagreement to moderate agreement that classes were more relevant after the internship.

Research Question 4. What is the perceived degree to which the occupational safety and health internship experience provided career value as determined by the internship survey questionnaire for graduates?

Table 5 reports the mean score for the interns' perceived degree to which the internship experience provided career value was 3.98 (SD = 1.04) on a five-point Likert-type scale with 1 = strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, and 5 = strongly agree with the career value of the internship. Of the 192 respondents, 139 (72.4 %) rated the internship a 4 or 5 indicating moderate to strong agreement that the internship provided professional value. Strongest agreement (4.35) occurred relative to the internship providing career-related experience important for resume'-development. Lowest agreement (3.51) occurred relative to obtaining contacts for future job possibilities. This score indicated neither agreement nor disagreement to moderate agreement that contacts were made that could lead to future jobs.

Research Question 5. What is the perceived degree to which the occupational safety and health internship experience provided summed personal, professional, and career value as determined by the internship survey questionnaire for graduates?

The mean score for the interns' perceived degree to which the internship experience provided personal, professional, and career value was 4.11 ($SD = .93$) on a five-point Likert-type scale with 1 = strongly disagree, 2 = moderately disagree, 3 = neither agree nor disagree, 4 = moderately agree, and 5 = strongly agree with the summed personal, professional, and career value of the internship, see Table 5. Of the 192 respondents, 149 (77.6 %) rated the internship a 4 or 5 indicating moderate to strong agreement that the internship provided personal, professional, and career value. Strongest agreement (4.45) occurred relative to the internship providing a positive educational experience. Lowest agreement (3.51) occurred relative to obtaining contacts for future job possibilities. This score indicated neither agreement nor disagreement to moderate agreement that contacts were made that could lead to future jobs, see Table 6.

Research Question 6. What is the perceived level of importance placed on selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?

The selected attributes or characteristics of the occupational safety and health internship experience addressed in this question were found in survey questions numbers 15 through 32. Intern perceptions of importance were measured on a five-point Likert-type scale with 1 = very unimportant, 2 = somewhat unimportant, 3 = neither important nor unimportant, 4 = somewhat important, and 5 = very important. The mean level of importance of these attributes are reported in Table 7 and ranged from a mean score of

Table 5

*Perceived Degree to Which the Occupational Safety and Health Internship Experience Provided Summed Personal, Professional, and Career Value (Dependent Variables)
N=193*

Dependent Variable	N	Missing	Mean	Std. Dev.	Value	
					Min	Max
Personal Value (Survey Questions 51-54)	192	1	4.11	.88	1	5
Professional Value (Survey Questions 55-59)	192	1	4.19	.90	1	5
Career Value (Survey Questions 60-62)	192	1	3.98	1.04	1	5
Summer Personal, Professional, & Career Value (Survey Questions 51-62)	192	1	4.11	.93	1	5

3.58 (SD 1.00) on question 15, receiving pre-employment information, to a mean score of 4.63 (SD .75) on question 32, performing challenging work assignments. The overall mean level of importance score was 4.31 (SD .91) with 88.9 percent of the participants rating the 18 specific key attributes of the internship experience as somewhat to very important.

As recorded in Table 8, the ten internship attributes which received the highest levels of perceived importance were: learning skills from experience, 4.63 (SD .75); interacting with management, 4.58 (SD .75); gaining confidence in technical skills, 4.50 (SD .71); obtaining career related experience for resume'-building 4.46 (SD .79); receiving on-site orientation 4.45 (SD .83); applying academic knowledge and skills to

Table 6

Perceived Degree to Which the Occupational Safety and Health Internship Experience Provided Personal, Professional, and Career Value (Dependent Variables, Survey Questions 51-62) N=193

Survey Question	N	Missing	Mean	Std. Dev.	Value	
					Min	Max
51. Basic communications	192	1	4.25	.86	2	5
52. ID personal strengths	192	1	4.09	.84	1	5
53. Understand myself	192	1	3.98	.96	1	5
54. Develop personal qual	192	1	4.09	.84	1	5
55. Classes more relevant	192	1	3.97	1.09	1	5
56. Positive education exp	192	1	4.45	.90	1	5
57. Gained technical skills	192	1	4.15	.89	1	5
58. Importance of human	192	1	4.36	.80	2	5
59. Improve problem solve	192	1	4.05	.82	1	5
60. Provided resume'-dev.	192	1	4.35	.81	1	5
61. Prepared for career	192	1	4.08	1.02	1	5
62. Contacts for future	192	1	3.51	1.29	1	5

real situations, 4.44 (SD .77); having a well-defined job description, 4.39 (SD .90); performing challenging work assignments, 4.39 (SD .76); working cooperatively with others, 4.39 (SD .83); and using and developing basic skills, 4.39 (SD .87).

Research Question 7. What is the perceived level of satisfaction with selected characteristics of the internship experience as determined by the internship survey questionnaire for graduates?

The perceived level of satisfaction with the identified attributes of the occupational safety and health internship experience are summarized in Table 9. Intern perceptions of satisfaction were measured on a five-point Likert-type scale with 1 = very dissatisfied, 2 = somewhat dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = somewhat satisfied, and 5 = very satisfied. The mean-summed satisfaction score for survey questions 33 through 50 was 3.85 (SD 1.02) which reflected the participants being neither satisfied nor dissatisfied to somewhat satisfied with the internship experience. The level of satisfaction with the attributes of the internship ranged from a low mean score of 3.21 (SD 1.06) for question 33, receiving pre-employment information, to a high mean score of 4.27 (SD .81) for question 48, learning skills from experience.

As recorded in Table 10, the ten internship attributes which received the highest levels of perceived satisfaction were: learning skills from experience, 4.27 (SD .81); working cooperatively with others, 4.24 (SD .84); obtaining career related experience for resume'-building, 4.16 (SD .94); using and developing basic skills, 4.12 (SD .84); gaining confidence in technical skills, 4.02 (SD .99); interacting with management, 4.02 (SD 1.03); performing challenging work assignments, 3.96 (SD 1.00); applying academic knowledge and skills to real situations, 3.96 (SD .99); and exploring career interests, 3.90 (SD 1.03).

Table 11 reports the ranked level of satisfaction, see Table 10, with each of the ten most important ranked attributes, see Table 8, of the occupational safety and health internship experience as determined by mean scores in response to the importance and satisfaction scales, survey questions 15 through 50. Eight of the 10 most important internship attributes were also among the ten highest ranked internship attributes in

Table 7

Perceived Level of Importance of Specific Attributes to an Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 15-32) N=193

Importance	N	Missing	Mean	Std. Dev.	Value	
					Min	Max
Question:						
15. Pre-employment information	193	0	3.58	1.00	1	5
16. Compensation benefits	193	0	4.13	.92	1	5
17. Job description	193	0	4.39	.90	1	5
18. On-site orientation	193	0	4.45	.82	1	5
19. Interaction with management	193	0	4.58	.75	1	5
20. Contact with faculty coordinator	193	0	4.07	.97	1	5
21. Special training	193	0	3.96	.97	1	5
22. Development of basic	193	0	4.39	.87	2	5
23. Confidence in technical skills	193	0	4.50	.71	1	5
24. Identify strengths and weaknesses	193	0	4.30	.85	1	5
25. Explore career interests	193	0	4.30	.86	1	5
26. Career related experience	193	0	4.46	.79	1	5
27. Future job possibilities	193	0	4.20	.93	1	5
28. Take responsibility	193	0	4.37	1.29	1	5
29. Academic to real-world	193	1	4.44	.77	1	5
30. Learning skills from exp	192	0	4.63	.75	1	5
31. Working with others	193	0	4.39	.83	1	5
32. Challenging assignments	193	0	4.39	.76	1	5

Table 8

Rank Order of Importance of Specific Attributes to An Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 15-32) N=193

Rank Order of Importance		Mean	Std. Dev.
Question:			
1.	30. Learning skills from experience	4.63	.75
2.	19. Interaction with management	4.58	.75
3.	23. Confidence in technical skills	4.50	.71
4.	26. Career related experience	4.46	.79
5.	18. On-site orientation	4.45	.82
6.	29. Academic to real-world	4.44	.77
7.	17. Job description	4.39	.90
8.	32. Challenging assignments	4.39	.76
9.	31. Working with others	4.39	.83
10.	22. Development of basic	4.39	.87
11.	28. Take responsibility	4.37	1.29
12.	25. Explore career interests	4.30	.86
13.	24. Identify strengths and weaknesses	4.30	.86
14.	27. Future job possibilities	4.20	.93
15.	16. Compensation benefits	4.13	.92
16.	20. Contact with faculty coordinator	4.07	.97
17.	21. Special training	3.96	.97
18.	15. Pre-employment information	3.58	1.00
<i>Note.</i> 1. = highest ranked, most important			

Table 9

Perceived Level of Satisfaction of Specific Attributes to an Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 33-50) N = 193

Satisfaction	N	Missing	Mean	Std. Dev.	Value	
					Min	Max
Question:						
33. Pre-employment information	192	1	3.21	1.06	1	5
34. Compensation benefits	192	1	3.54	1.28	1	5
35. Job description	192	1	3.44	1.12	1	5
36. On-site orientation	192	1	3.85	1.10	1	5
37. Interaction with management	191	2	4.02	1.03	1	5
38. Contact with faculty coordinator	192	1	3.88	1.05	1	5
39. Special training	192	1	3.41	1.11	1	5
40. Development of basic	192	1	4.12	.84	2	5
41. Confidence in technical skills	192	1	4.02	.99	1	5
42. Identify strengths and weaknesses	192	1	3.87	.98	1	5
43. Explore career interests	192	1	3.90	1.03	1	5
44. Career related experience	192	1	4.16	.94	1	5
45. Future job possibilities	192	1	3.65	1.26	1	5
46. Take responsibility	192	1	3.93	.96	1	5
47. Academic to real-world	192	1	3.96	.99	1	5
48. Learning skills from exp	192	1	4.27	.81	1	5
49. Working with others	192	1	4.24	.84	1	5
50. Challenging assignments	192	1	3.96	1.00	1	5

satisfaction with the internship experience. The number one ranked important attribute, learning skills from experience, was also the number one most satisfying characteristic of the internship experience. The other seven of the top ten important internship attributes that were also in the top ten most satisfying attributes included: interacting with management, gaining confidence in technical skills, career related experience for resume'-building, applying academic knowledge and skills to real situations, performing challenging work assignments, working cooperatively with others, and developing basic skills, see Table 11.

Two of the 10 most important internship attributes received low mean scores on the satisfaction scale. Receiving on-site orientation was the number five ranked important internship attribute, but ranked 13 of 18 on the mean satisfaction scale. Having a well-defined job description ranked seventh in importance while scoring a low mean satisfaction score that ranked 16 of 18 on the satisfaction scale, see Table 11. As indicated in Table 11, the remaining eight internship attributes ranked in the lower half in importance and were correspondingly ranked lower in satisfaction mean score with the internship experience.

Research Question 8. Is there a difference between female and male students' perceptions of the importance of the internship experience as determined by the internship survey questionnaire for graduates?

An independent sample *t* test was calculated on the dependent variable importance of the internship experience (survey questions 15 – 32) and the independent variable gender (survey question 1) of the sample population, 40 female and 152 male interns. The mean importance score for the females was 4.5225 (SD .348) on the five-

Table 10

Rank Order of Satisfaction of Specific Attributes to an Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 33-50) N=193

Rank Order of Importance	Mean	Std. Dev.
Question:		
1. 48. Learning skills from experience	4.27	.81
2. 49. Working with others	4.24	.84
3. 44. Career related experience for resume'	4.16	.94
4. 40. Development of basic skills	4.12	.84
5. 41. Confidence in technical skills	4.02	.99
6. 37. Interaction with management	4.02	1.03
7. 50. Challenging assignments	3.96	1.00
8. 47. Academic to real-world	3.96	.99
9. 46. Take responsibility	3.93	.96
10. 43. Explore career interests	3.90	1.03
11. 38. Contact with faculty coordinator	3.88	1.05
12. 42. Identify strengths and weaknesses	3.87	.98
13. 36. On-site orientation	3.85	1.10
14. 45. Future job possibilities	3.65	1.26
15. 34. Compensation benefits	3.54	1.28
16. 35. Job description	3.44	1.12
17. 39. Special training	3.41	1.11
18. 33. Pre-employment information	3.21	1.06

Note. 1. = highest ranked, most satisfaction

point Likert-type importance scale while the mean importance score for the males was 4.2500 (SD .577) for a mean difference of .2725. A Levene's Test for equality of variances of the female and male means was not significant, $p = .216$, and the mean variances are assumed to be equal. The t value calculated was 2.85 with 190 degrees of freedom and was statistically significant at the .05 level, $t(190) = 2.85, p < .005$. The 95 percent confidence interval for differences in sample means ranges from .084 to .461 with the current sample mean difference at .2725.

Research Question 9. Is there a difference between female and male students in regard to internship salary, bachelor's degree grade point average, and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?

Independent sample t tests were calculated to determine if a difference existed between female and male interns (survey question 1) in regard to internship salary (survey question 13), bachelor's degree grade point average (survey question 4), and the perceived degree to which the internship experience provided personal, professional, and career value (survey questions 51 – 62).

The mean salary for 40 female interns was \$11.38 (SD 6.17) and the mean salary for 147 males was \$14.41 (SD 49.60) for a mean difference of $-\$3.03$. A Levene's Test for equality of variances of the female and male means was not significant, $p = .454$, and the mean variances are assumed to be equal. The t value calculated was $-.39$ with 185 degrees of freedom and was not statistically significant at the .05 level, $t(185) = -.39$,

Table 11

Rank Order of Importance with Associated Level of Satisfaction of Specific Attributes to an Occupational Safety and Health Internship Experience (Dependent Variables, Survey Questions 15-32 & 33-50) N = 193

Importance			Satisfactions	
Rank	Score	Questions	Rank	Score
1	4.27	30. & 48. Learning skills from experience	1	4.27
2.	4.24	19. & 37. Interaction with management	6	4.02
3	4.16	23. & 41. Confidence in technical skills	5	4.02
4	4.12	26. & 44. Career related experience	3	4.16
5	4.02	18. & 36. On-site orientation	13	3.85
6	4.02	29. & 47. Academic to real-world	8	3.96
7	3.96	17. & 35. Job description	16	3.44
8	3.96	32. & 50. Challenging assignments	7	3.96
9	3.93	31. & 49. Working with others	2	4.24
10	3.90	22. & 40. Development of basic skills	4	4.12
11	3.88	28. & 46. Take responsibility	9	3.92
12	3.87	25. & 43. Explore career interests	10	3.90
13	3.85	24. & 42. Identify strengths and weaknesses	12	3.85
14	3.65	27. & 45. Future job possibilities	14	3.65
15	3.54	16. & 34. Compensation benefits	15	3.54
16	3.44	20. & 38. Contact with faculty coordinator	11	3.88
17	3.41	21. & 39. Special training	17	3.41
18	3.21	15. & 33. Pre-employment information	18	3.21

Note. 1. = highest ranked, most importance and most satisfaction

$p < .701$. The number of female interns responding to survey question 4, bachelor's grade point average (GPA) was only 30 of 40 and only 126 of 152 male interns responded to this question, total $N = 156$. The mean GPA for females was 2.17 (SD .84) on a four-point scale while the male mean GPA was 2.31 (SD .82) resulting in a mean difference of -.14. A Levene's Test for equality of variances of the female and male means was not significant, $p = .823$, and the mean variances are assumed to be equal. The t value calculated was -.85 with 184 degrees of freedom and was not statistically significant at the .05 level, $t(184) = -.85, p < .396$.

The mean-summed personal, professional, and career value for 40 female interns was 4.1229 (SD .817) on the five-point Likert-type value scale and the mean summed value for 151 males was 4.1093 (SD .577) for a mean difference of .0136. A Levene's Test for equality of variances of the female and male means was not significant, $p = .027$, and the mean variances are assumed to be equal. The t value calculated was .12 with 189 degrees of freedom and was not statistically significant at the .05 level, $t(189) = .12, p < .904$.

Research Question 10. Is there a difference between student's internship primary duties and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?

A one-way analysis of variance (ANOVA) was calculated on the dependent variable personal, professional, and career value (survey questions 51-62) and the internship independent variable, primary duties (survey question 10). The four job duty classifications, environmental health and safety, industrial hygiene, safety generalist, and

other, were compared on the central tendency of the independent variable, perceived value of the internship experience. The mean internship value scores for each job duty classification were; environmental health and safety 4.1570 (SD .608), industrial hygiene 4.2847 (SD .550), safety generalist 4.0970 (SD .604), and other 3.8889 (SD 1.108). As shown in Table 12, the ANOVA verified that no significant difference existed between any of the means of the various job classifications, $F(3, 188) = .7697, p = .5123$.

Table 12

Source Table of ANOVA Conducted on the Dependent Variable Personal, Professional, and Career Value of the Occupational Safety and Health Internship Experience and Independent Variable Internship Primary Duties (Dependent Variables, Survey Questions 51-62 & Independent Variable, Survey Question 10) N=192

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F	P
Between Groups	.9217	3	.3072	.7697	.5123
Within Groups	75.0478	188	.3992		
Total	75.9696	191			

Research Question 11. Is there a difference between internship site industry or a relationship between number of employees at the internship site and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value as determined by the internship survey questionnaire for graduates?

Survey question 9 listed nine internship site industries from which the respondent selected the classification that best fit his or her work site. When the data were compiled, four of these sites had one to eight interns in consulting, food industry, insurance industry, or mining industry sites. These four categories were regrouped into similar

types of industries to provide adequate numbers of respondents to allow analysis of variance to proceed. The revised internship site industry categories are; Chemical/Petro-Chemical Industries, Construction and Mining Industries, Service Industries (consulting, food, and insurance industries), Government Agencies, Manufacturing Industries, and Other Industries.

A one-way analysis of variance (ANOVA) and multiple comparisons test were calculated on the dependent variable personal, professional, and career value (survey questions 51-62) and the independent variable, internship site industry (survey question 9). The six revised internship site classifications were compared on the central tendency of the independent variable, perceived value of the internship experience. The mean internship value scores for each site industry classification were; Chemical/Petro-Chemical Industries 4.2500 (SD .529), Construction and Mining Industries 4.2500 (SD .606), Service Industries (consulting, food, and insurance industries) 3.7917 (SD .789), Government Agencies 4.0313 (SD .820), Manufacturing Industries 4.1226 (SD .560), and Other Industries 4.1346 (SD .663), see Table 13.

A significant difference was found at the $p < .05$ level between the perceived value of the internship experience and the various internship sites, $F(5, 186) = 5.39, p = .0439$. A Fisher LSD post hoc multiple comparisons test was required for a comparison of the six site industry means to determine which sites were significantly different at the $p < .05$ level. When comparing these six industry site means on the mean of the dependent variable, perceived value, two significant differences were found. The difference between the means of the Chemical/Petro-chemical classification, of 4.25 (SD .529), and the Service Industries, 3.79 (SD .789) were statistically different at the $p = .05$

level. The second significant difference at the $p = .05$ level was between the means of the Construction/Mining sites, 4.25 (SD .606), and the Service Industries, 3.79 (SD .789), see Table 14. These statistically significant differences are confirmed in the 95 percent confidence interval of the Fisher LSD table, Table 14, in that the lower and upper limits of the confidence interval contain the means and the limits are of the same sign without zero between the limits.

Interns worked at site industries with a wide range of number of employees, five to over 10,000. Most interns (67.4%) worked for large companies, 250 + employees, with a mean of 1199 employees at the internship site. The Pearson product moment correlation coefficient was calculated to determine the magnitude and relationship between number of employees at the internship site and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value. As seen in Table 15, the Pearson correlation coefficient shows no statistically significant relationship between the number of internship site employees and the perceived personal, professional, and career value of the internship experience.

Research Question 12. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts personal, professional, and career value of the internship experience better than any one independent variable alone as determined by the internship survey questionnaire for graduates?

Multiple linear regression analysis was applied to determine if more than one independent variable at a time provides additional information to predict the personal,

professional, and career value of the internship experience better than any one independent variable alone. The purpose of this regression analysis is to predict a scale level dependent variable, personal, professional, and career value, from a combination of

Table 13

Descriptive Statistics for the Internship Site Industries Compared on the Personal, Professional, and Career Value of the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 51-62) N=192

Site Industry	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean
chem/petro	16	4.2500	.52880	.13220	3.9682 to 4.5318
const/mining	18	4.2500	.60566	.14276	3.9488 to 4.5512
service	16	3.7917	.78881	.19720	3.3713 to 4.2120
government	16	4.0313	.81982	.20496	3.5944 to 4.4681
manufacturing	87	4.1226	.56029	.06007	4.0032 to 4.2420
other	39	4.1346	.66299	.10616	3.9197 to 4.3495
Total	192	4.1124	.63067	.04551	4.0226 to 4.2022

several scale and dichotomous independent or predictor variables, gender, GPA, age, number of employees, salary, and full-time job offer. However, only one of these independent variables, salary, was statistically significant in predicting the personal, professional, and career value of the internship experience, $F(1, 147) = 5.72, p = .018$.

Table 16 summarizes the multiple regression analysis. The standardized beta coefficients, t scores, and statistical significance of each predictor variable are shown.

Table 14

Multiple Comparisons LSD Test for ANOVA Source for Internship Site Industries Compared on the Personal, Professional, and Career Value of the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 51-62) N=192

Type of Site Industry (I)	Type of Site Industry (J)	Mean Differ (I-J)	Std. Error	Sig	95% Confidence Interval for Mean
chem/petro	const/mining	.0000	.21606	1.000	-.4262 to .4262
	service	.4583*	.22232	.041	.0197 to .8969
	government	.2188	.22232	.326	-.2198 to .6573
	manufacturing	.1274	.17105	.457	-.2101 to .4648
	other	.1154	.18669	.537	-.2529 to .4837
const/mining	chem/petro	.0000	.21606	1.000	-.4262 to .4262
	service	.4583*	.21606	.035	.0321 to .8846
	government	.2188	.21606	.313	-.2075 to .6450
	manufacturing	.1274	.16283	.435	-.1938 to .4486
	other	.1154	.17918	.520	-.2381 to .4689

Note. * = difference is significant at the .05 level.

Table 15

Pearson Correlation Coefficient and Significance for Internship Site Industries Employment and the Personal, Professional, and Career Value of the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 51-62) N = 190

Dependent Variable	Independent Variable: Total Number of Employees
Personal, Professional, Career Value of the Internship	Pearson Correlation = .054
	Sig. (2tailed) = .461

Note. No significance at < .05 level

The standardized coefficients were interpreted like correlation coefficients. There was only one significant *t* score indicating that salary per hour was the only predictor variable that make a statistically significant contribution to the prediction of internship value. The other predictor variables were not statistically significant but could still be making a contribution to the determination of the value of the internship experience (Gliner & Morgan, 2000).

The multiple regression model summary, Table 17, shows that the multiple correlation coefficient (*R*) is .194 and the adjusted *R*-square is .031, meaning that only 3.1 percent of the variance in personal, professional, and career value of the internship experience can be predicted from six variables combined. *R*, based on the adjusted *R*-squared, is .176 which is a rough estimate of the effect size. An *r* of .176 is a small effect size according to Cohen (1988). In this analysis of effect size, the independent variables combined had only a limited, weak relationship to the dependent variable, personal, professional, and career value of the internship experience.

Research Question 13. Is there a combination of scale and dichotomous independent variables (gender, GPA, age, number of employees, salary, and full-time job offer) that predicts the perceived degree of satisfaction with the internship experience better than any one independent variable alone as determined by the internship questionnaire for graduates?

Multiple linear regression analysis was applied to determine if a combination of scale and dichotomous independent variables predicted the perceived degree of satisfaction with the internship experience better than any one independent variable

alone. The purpose of this regression analysis was to predict a scale level dependent variable, satisfaction with the internship experience, from a combination of several scale

Table 16

Summary of Linear Regression Analysis of Selected Independent Variables Predictive Ability of the Personal, Professional, and Career Value of the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 51-62) N=190

Model	Standardized coefficients		
	Beta	t	Significance
Constant (all variables)		44.838	.000*
Gender	-.047	-.578	.564
BS GPA	-.022	-.271	.787
Age	.007	.084	.933
Number of employees	.024	.291	.771
Salary	.194	2.392	.018*
Full-time job offer	.095	1.170	.244

Note. * = significance at <.05 level.

Table 17

Model Summary of Linear Regression Analysis for the Level of Personal, Professional, and Career Value of the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 51-62) N=190

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
1	.194	.037	.031	.57199

Note. * = Predictors: Constant, Salary for first internship

and dichotomous independent or predictor variables, gender, GPA, age, number of employees, salary, and full-time job offer. Only one of these independent variables, salary, was statistically significant in predicting the satisfaction of the internship experience, $F(1, 147) = 6.44, p = .012$.

Table 18 summarizes the multiple regression analysis. The standardized beta coefficients, t scores, and statistical significance of each predictor variable are shown. The standardized coefficients were interpreted like correlation coefficients. There was only one significant t score indicating that salary per hour was the only predictor variable that made a statically significant contribution to the prediction of internship satisfaction. The other predictor variables were not statistically significant but could still be making a contribution to the determination of satisfaction with the internship experience (Gliner & Morgan, 2000).

The multiple regression model summary, Table 19, shows that the multiple correlation coefficient (R) is .205 and the adjusted R-square is .035, meaning that only 3.5 percent of the variance in the internship satisfaction could be predicted from six variables combined. R , based on the adjusted R-squared, is .187, which was a rough estimate of the effect size. An r of .187 is a small effect size according to Cohen (1988). In this analysis of effect size, the independent variables combined had only a limited, weak relationship to the dependent variable, satisfaction with the internship experience.

Research Question 14. What are the major sources of value and satisfaction, or dissatisfaction, from the internship experience as determined by the internship survey questionnaire for graduates?

The qualitative research findings to address this question were based on constant comparative analysis of respondent answers to five open-ended questions on the survey research instrument: What did you like best about your internship experience? What did

Table 18

Summary of Linear Regression Analysis of Selected Independent Variables Predictive Ability of the Satisfaction with the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 33-50)

Model	Standardized coefficients		
	Beta	t	Significance
Constant (all variables)		39.668	.000*
Gender	-.013	-.156	.877
BS GPA	-.064	-.779	.437
Age	.017	.207	.836
Number of employees	.056	.674	.501
Salary	.205	2.537	.012*
Full-time job offer	.082	1.012	.313

Note. * = significance at <.05 level

Table 19

Model Summary of Linear Regression Analysis for the Level of Satisfaction with the Occupational Safety and Health Internship Experience (Dependent Variable, Survey Questions 33-50) N=190

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
1	.205*	.042	.035	.60234

Note. * = Predictors: Constant, Salary for first internship

you like least about your internship experience? What would you do differently about your internship experience if given the choice to do it over? What key insights would you share with an occupational safety and health student who is pursuing an internship experience? What additional comments would you share?

Of the 193 survey questionnaires returned, 180 (93.3%) contained responses to the open-ended questions used for this qualitative analysis. A total of 955 responses were segmented and subjected to an open coding process, see Table 20. The first level coding of this data resulted in the establishment of 15 open codes describing the internship experience: personal value, professional value, career value, important characteristic, satisfaction, location, site industry, reflection, duties, site supervisor, structure; preparation, faculty coordinator, personal responsibility, and recommendation. A complete listing of the responses in each first level code category is found in Appendix E.

The open coded content was compared with each other to establish second level or axial codes that hold a related group of open codes together. The axial codes are: preparation for the internship; stakeholder responsibilities; key attributes for success; and personal, professional, and career value of the internship. Table 21 shows the relationship of the open codes to the second level axial codes.

Table 20

Summary of First Level Coding of Qualitative Data to Address Recent Graduate Perception of the Value of and Satisfaction with the Occupational Safety and Health Internship Experience - Satisfaction Matrix

Open Code	Satisfaction Measurement:		Recommendation
	Positive Response (+)	Negative Response (-)	
Personal value (V, Pe)	23	7	
Professional value (V, Pr)	28	8	
Career value (V, Ca)	38	3	
Important characteristic (I)	192	78	
Location (Loca)	2	17	
Site industry (Site)	9	1	
Reflection (Reflect)	4	3	
Duties (Du)	2	31	
Site supervisor (Super)	3	19	
Internship structure (Stru)	2	46	
Preparation (Prep)	3	6	
Faculty coordinator (Coord)	0	3	
Personal responsibility (Pr)			239
Recommendations (Rec)			187
Total	307	222	426

Table 21

Relationship of First Level Code to Second Level Axial Coding of Qualitative Data to Address Recent Graduate Perception of the Value of and Satisfaction with the Occupational Safety and Health Internship Experience

Axial Code	Open Code
Preparation phase for the internship	Preparation Location Site industry Personal responsibility Recommendations
Stakeholder responsibilities	Internship structure Intern duties Faculty coordinator Site supervisor Reflection
Key attributes for success	Important characteristics
Personal, professional, & career value	Personal value Professional value Career value

The axial codes formed the major categories that induced the conceptual relationships among the categories, which are referred to as selective code. This third level or selective coding classified the second level coding and allowed major constructs or themes to emerge for the qualitative data. The major constructs that emerged from constant comparative analysis of the qualitative data collected from the survey research questionnaire were as follows:

1. Students must assume responsibility for researching the internship hosting company, job position duties, reporting responsibilities, compensation, site location, and type of industry to determine how these internship

characteristics align with the student's personal interest and the student's personal and professional development needs.

2. Students must prepare for the internship work assignment by researching and acquiring knowledge of the site industry safety and health-related issues and appropriate safety and health regulations.
3. Responsibilities for all internship stakeholders, student, employer, and university, must be clearly defined to maximize learning outcomes. A well-defined job description, clearly stated learning objectives, effective communications responsibilities, and definition of the assessment process were key to student satisfaction and success.
4. Students must assume responsibility for accomplishment of their learning outcomes through the internship experience by pursuing increasingly more responsible job assignments, taking advantage of opportunities to interact with management, employees, and the community, and by interacting with the site and faculty internship coordinators to ensure learning objectives are being accomplished.
5. The internship experience was valuable in providing the opportunity to apply classroom learning to real-life situations, developing basic communications and people skills, determining career direction and employment opportunities, learning new technical skills, and building resume'-quality experience.
6. The internship was a satisfying experience when the intern was involved with management, staff, and employees while performing career-related, challenging work assignments.

7. **Students were dissatisfied with the internship experience when important characteristics of the internship were lacking or did not meet the intern's personal and/or professional development needs. Key dissatisfactions were: inadequate compensation (salary, housing, and travel reimbursement); lack of internship organization, orientation, and well-defined job duties; lack of interaction with site and faculty internship coordinators; personally disruptive work site locations; performing non career-related and unchallenging work assignments; lack of assigned job site responsibility; and limited opportunity to work with others at the job site.**

The core category that represented the central phenomenon or main theme around which the above major constructs were integrated emerged as follows: Students must assume personal responsibility for selecting and preparing for the internship experience and ensure job duties, learning outcomes, employment benefits, responsibilities of all stakeholders, and assessment of learning are clearly established to provide an opportunity to apply classroom learning to real-life situations and ensure value of and satisfaction with the occupational safety and health internship experience.

Summary

All of the 193 participants in this study were recent graduates (1997-2001) of universities offering ABET accredited degree programs in occupational safety and health. This research study population was typically a 25.13 year old, white, single male who completed his first internship while receiving a bachelor's degree.

The typical internship sites were manufacturing, other sites (university, pulp and paper, trucking, utilities, and health care), and government agencies with two-thirds of

the interns having responsibility as safety generalists. The geographical location of the internship sites were evenly distributed over urban, rural, and suburban areas. The number of employees at the internship site varied widely (five to over 10,000) with a mean of 1,199 employees. The salary level of the interns ranged from \$0 to \$38 per hour with a mean salary of \$10.12 per hour. Of the 192 participants responding, 73 were offered full-time employment following their internship experience. Of this group, 48 (65.8%) accepted the employment offer.

Results of data analysis indicated that the mean-summed personal, professional, and career value score was 4.11 (SD = .93) on the five-point Likert-type scale with 1 = strongly disagree and 5 = strongly agree with the value of the internship experience. Of the 192 respondents, 149 (77.6%) rated the internship a 4 or 5 indicating moderate to strong agreement that the internship provided personal, professional, and career value.

Each of the 18 key attributes of the internship had 88.9 percent of the respondents indicating that each of the attributes was somewhat to very important to an occupational safety and health internship experience with a mean satisfaction score of 4.31 (SD .91) on the five-point Likert-type scale. The ten internship attributes which received the highest levels of perceived importance were: learning skills from experience, 4.63 (SD .75); interacting with management, 4.58 (SD .75); gaining confidence in technical skills, 4.50 (SD .71); obtaining career related experience for resume'-building 4.46 (SD .79); receiving on-site orientation 4.45 (SD .83); applying academic knowledge and skills to real situations, 4.44 (SD .77); having a well-defined job description, 4.39 (SD .90); performing challenging work assignments, 4.39 (SD .76); working cooperatively with others, 4.39 (SD .83); using and developing basic skills, 4.39 (SD .87).

The mean-summed satisfaction score for the 18 important internship attributes was 3.85 (SD 1.02) which reflects the participants being neither satisfied nor dissatisfied to somewhat satisfied with the internship experience. Eight of the ten most important internship attributes were also among the ten highest ranked internship attributes in satisfaction with the internship experience. The number one ranked important attribute, learning skills from experience, is also the number one most satisfying characteristic of the internship experience. The other seven of the top ten important internship attributes that are also in the top ten most satisfying attributes are: interacting with management, gaining confidence in technical skills, career related experience for resume'-building, applying academic knowledge and skills to real situations, performing challenging work assignments, working cooperatively with others, and developing basic skills. Two of the ten most important internship attributes received low mean scores on the satisfaction scale. Receiving on-site orientation was the number five ranked important internship attribute but ranked 13 of 18 on the mean satisfaction scale. Having a well-defined job description ranked seventh in importance while scoring a low mean satisfaction score that ranked 16 of 18 on the satisfaction scale.

An independent *t* test demonstrated that the internship experience was significantly more important to female than to male interns. Additional independent sample *t* tests were calculated to determine if other differences between female and male interns existed. No differences between the genders were significant relative to internship salary, bachelor's degree GPA, or the perceived degree to which the internship provided personal, professional, and career value.

A one-way analysis of variance (ANOVA) was calculated on the dependent variable personal, professional, and career value and the internship independent variable, primary duties. The four job duty classifications, environmental health and safety, industrial hygiene, safety generalist, and other, were compared on the central tendency of the independent variable, perceived value of the internship experience. The ANOVA verified that no significant difference existed between any of the means of the various job classifications and the personal, professional, and career value and the internship.

An ANOVA with multiple comparisons test was calculated on the dependent variable personal, professional, and career value and the independent variable, internship site industry. The six revised internship site classifications were compared on the central tendency of the independent variable, perceived value of the internship experience.

A significant difference was found at the $p < .05$ level between the perceived value of the internship experience and the various internship sites. The difference between the means of the Chemical/Petro-chemical classification, of 4.25 (SD .529), and the Service Industries, 3.79 (SD .789) were statistically different at the $p = .05$ level. The second significant difference at the $p = .05$ level was between the means of the Construction/Mining sites, 4.25 (SD .606), and the Service Industries, 3.79 (SD .789).

Interns worked at site industries with a wide range of number of employees, five to over 10,000. Most interns (67.4%) worked for large companies, 250 + employees, with a mean of 1199 employees at the internship site. The Pearson product moment correlation coefficient was calculated to determine the magnitude and relationship between number of employees at the internship site and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and

career value. However, the Pearson correlation coefficient showed no statistically significant relationship between the number of internship site employees and the perceived personal, professional, and career value of the internship experience.

Multiple linear regression analysis was applied to determine if more than one independent variable at a time provides additional information to predict the personal, professional, and career value of the internship experience better than any one independent variable alone. The purpose of this regression analysis was to predict a scale level dependent variable, personal, professional, and career value, from a combination of several scale and dichotomous independent or predictor variables, gender, GPA, age, number of employees, salary, and full-time job offer. However, only one of these independent variables, salary, was statistically significant in predicting the personal, professional, and career value of the internship experience.

Multiple linear regression analysis was also applied to determine if a combination of scale and dichotomous independent variables predicted the perceived degree of satisfaction with the internship experience better than any one independent variable alone. The purpose of this regression analysis was to predict a scale level dependent variable, satisfaction with the internship experience, from a combination of several scale and dichotomous independent or predictor variables, gender, GPA, age, number of employees, salary, and full-time job offer. Again, only one of these independent variables, salary, was statistically significant in predicting the satisfaction of the internship experience.

The major constructs that emerged from constant comparative analysis of the qualitative data collected from the survey research questionnaire were as follows:

- 1. Students must assume responsibility for researching the internship hoisting company, job position duties, reporting responsibilities, compensation, site location, and type of industry to determine how these internship characteristics align with the student's personal interest and the student's personal and professional development needs.**
- 2. Students must prepare for the internship work assignment by researching and acquiring knowledge of the site industry safety and health-related issues and appropriate safety and health regulations.**
- 3. Responsibilities for all internship stakeholders, student, employer, and university, must be clearly defined to maximize learning outcomes. A well-defined job description, clearly stated learning objectives, effective communications responsibilities, and definition of the assessment process were key to student satisfaction and success.**
- 4. Students must assume responsibility for accomplishment of their leaning outcomes through the internship experience by pursuing increasingly more responsible job assignments, taking advantage of opportunities to interact with management, employees, and the community, and interacting with the site and faculty internship coordinators to ensure learning objectives are being accomplished.**
- 5. The internship experience was valuable in providing the opportunity to apply classroom learning to real-life situations, developing basic communications and people skills, determining career direction and employment opportunities, learning new technical skills, and building resume'-quality experience.**

6. **The internship was a satisfying experience when the intern was involved with management, staff, and employees while performing career-related, challenging work assignments.**
7. **Students were dissatisfied with the internship experience when important characteristics of the internship were lacking or did not meet the intern's personal and/or professional development needs. Key dissatisfactions were: inadequate compensation (salary, housing, and travel reimbursement); lack of internship organization, orientation, and well-defined job duties; lack of interaction with site and faculty internship coordinators; personally disruptive work site locations; performing non career-related and unchallenging work assignments; lack of assigned job site responsibility; and limited opportunity to work with others at the job site.**

The selective code that represented the central phenomenon or main theme around which the above major constructs were integrated emerged as follows: Students must assume personal responsibility for selecting and preparing for the internship experience and ensure job duties, learning outcomes, employment benefits, responsibilities of all stakeholders, and assessment of learning are clearly established to provide an opportunity to apply classroom learning to real-life situations and ensure value of and satisfaction with the occupational safety and health internship experience.

CHAPTER V

DISCUSSION

This chapter contains a summary of the current study, comparison of the research findings in Chapter IV with the results found in the original Kraemer study (Kraemer, 1992), discussion of conclusions drawn from these findings, recommendations based on these research findings and related findings from the review of literature, needs for future research, and a summary of this discussion.

Summary of the Study

This study assessed the degree to which the occupational safety and health internship experience provided personal, professional, and career value for occupational safety and health graduates; determined those characteristics that contribute most to a worthwhile internship experience for occupational safety and health graduates; ascertained the extent to which occupational safety and health graduates were satisfied with the accomplishments of specific characteristics that were related to the internship experience; and determined those demographic and internship characteristics that contribute most to the overall satisfaction of an internship experience for occupational safety and health graduates. The 14 research questions identified to address the purpose of this study were explored using an ex post facto (non-experimental) survey questionnaire research design. The questionnaire was analyzed primarily in the quantitative paradigm using descriptive, comparative, associative, and complex

associative research analytical approaches to answer the 13 quantitative research questions, and constant comparative analysis was used to address the one qualitative research question.

The survey questionnaire consisted of 62 quantitative questions developed as a means of gathering demographic and internship data and responses of perceptions relative to the occupational safety and health internship experience. A Likert-type rating scale indicated the intensity with which the respondents agree or disagree with statements contained in the survey questionnaire. The survey also collected qualitative data along with the demographic and quantitative data. Five open-ended questions on the survey questionnaire allowed the participant to address issues relative to the value, satisfaction, and key characteristics of the internship experience that may or may not be reflected in the quantitative areas of the questionnaire. This combined quantitative and qualitative approach provided better understanding in the analysis of perceptions of the values and satisfactions associated with the internship experience.

The variables selected for this study consisted of 14 attribute independent (predictor) variables and five dependent (criterion) variables to address the perceived personal, professional, and career value of and satisfaction with the occupational safety and health internship experience. The independent variables were identified in Part I-- Demographic Data and Internship Information on the survey instrument. The five dependent variables in this study were measured on several summated five-point Likert scale questions in Part II of the survey questionnaire. The dependent variables were considered to be scale data for analytical purposes. The validity and reliability of the research instrument used in this study was established through a review of literature and

the empirical research results of the original Kraemer study coupled with the current research findings.

Before initiating this mailed survey questionnaire research study, an application requesting permission to conduct the research was submitted to and permission granted from the Colorado State University Human Research Committee. Permission to survey graduates of ABET accredited occupational safety and health degree programs was requested and received from each of the five universities offering these degree programs. These universities were Indiana University of Pennsylvania, Marshall University, Millersville University of Pennsylvania, Murray State University, and West Virginia University.

Descriptive statistics analyzed the general univariate pattern of the data. Descriptive statistics to include frequencies, percentages, ranges, means, and standard deviations were calculated to analyze the demographic and internship information questions. The Pearson product moment correlation coefficient measured the strength and direction of relationship between variables. Analysis of variance (ANOVA) and Fisher LSD post hoc test examined the differences between the independent variables and mean value and mean satisfaction scores. Multiple linear regression determined the relationship between the various predictor and criterion variables. Open-ended questions with associated narrative responses were analyzed in the qualitative research domain using constant comparative analysis.

The 193 participants in this study were recent graduates (1997-2001) of the five universities offering ABET accredited degree programs in occupational safety and health.

This research study population was typically a 25.13 year old, white, single male who completed his first internship while receiving a bachelor's degree.

The typical internship sites were manufacturing, other sites (university, pulp and paper, trucking, utilities, and health care), and government agencies with two-thirds of the interns having responsibility as safety generalists. The geographical locations of the internship sites were evenly distributed over urban, rural, and suburban areas. The number of employees at the internship site varied widely (five to over 10,000) with a mean of 1,199 employees. The salary level of the interns ranged from \$0 to \$38 per hour with a mean salary of \$10.12 per hour. Of the 192 participants responding, 73 were offered full-time employment following their internship experience. Of this group, 48 (65.8%) accepted the employment offer.

Results of data analysis indicated that the mean-summed personal, professional, and career value score was 4.11 (SD = .93) on the five-point Likert-type scale with 1 = strongly disagree and 5 = strongly agree with the value of the internship experience. Of the 192 respondents, 149 (77.6%) rated the internship a 4 or 5 indicating moderate to strong agreement that the internship provided personal, professional, and career value.

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receiving on-site orientation 4.45 (SD .83); applying academic knowledge and skills to real situations, 4.44 (SD .77); having a well-defined job description, 4.39 (SD .90); performing challenging work assignments, 4.39 (SD .76); working cooperatively with others, 4.39 (SD .83); using and developing basic skills, 4.39 (SD .87).

The mean-summed satisfaction score for the 18 important internship attributes was 3.85 (SD 1.02) which reflects the participants being neither satisfied nor dissatisfied to somewhat satisfied with the internship experience. Eight of the ten most important internship attributes were also among the ten highest ranked internship attributes in satisfaction with the internship experience. The number one ranked important attribute, learning skills from experience, was also the number one most satisfying characteristic of the internship experience. The other seven of the top ten important internship attributes that were also in the top ten most satisfying attributes were: interacting with management, gaining confidence in technical skills, career related experience for resume'-building, applying academic knowledge and skills to real situations, performing challenging work assignments, working cooperatively with others, and developing basic skills. Two of the ten most important internship attributes received low mean scores on the satisfaction scale. Receiving on-site orientation ranked number five as an important internship attribute but ranked 13 of 18 on the mean satisfaction scale. Having a well-defined job description ranked seventh in importance while scoring a low mean satisfaction score that ranked 16 of 18 on the satisfaction scale.

An independent *t* test demonstrated that the internship experience was significantly more important to female than to male interns. Additional independent sample *t* tests were calculated to determine if other differences between female and male

interns existed. No differences between the genders were significant relative to internship salary, bachelor's degree GPA, or the perceived degree to which the internship provided personal, professional, and career value.

A one-way analysis of variance (ANOVA) was calculated on the dependent variable personal, professional, and career value and the internship independent variable, primary duties. The four job duty classifications, environmental health and safety, industrial hygiene, safety generalist, and other, were compared on the central tendency of the independent variable, perceived value of the internship experience. The ANOVA verified that no significant difference existed between any of the means of the various job classifications and the personal, professional, and career value and the internship.

An ANOVA with multiple comparisons test was calculated on the dependent variable personal, professional, and career value and the independent variable, internship site industry. The six revised internship site classifications were compared on the central tendency of the independent variable, perceived value of the internship experience.

There was a significant difference was found at the $p < .05$ level between the perceived value of the internship experience and the various internship sites. The difference between the means of the Chemical/Petro-chemical classification, of 4.25 (SD .529), and the Service Industries, 3.79 (SD .789) were statistically different at the $p = .05$ level. The second significant difference at the $p = .05$ level was between the means of the Construction/Mining sites, 4.25 (SD .606), and the Service Industries, 3.79 (SD .789).

Interns worked at site industries with a wide range of number of employees, five to over 10,000. Most interns (67.4%) work for large companies, 250 + employees, with a mean of 1199 employees at the internship site. The Pearson product moment correlation

coefficient determined the magnitude and relationship between number of employees at the internship site and the perceived degree to which the occupational safety and health internship experience provided personal, professional, and career value. However, the Pearson correlation coefficient showed no statistically significant relationship between the number of internship site employees and the perceived personal, professional, and career value of the internship experience.

Multiple linear regression analysis determined if more than one independent variable at a time provided additional information to predict the personal, professional, and career value of the internship experience better than any one independent variable alone. The purpose of this regression analysis was to predict a scale level dependent variable, personal, professional, and career value, from a combination of several scale and dichotomous independent or predictor variables, gender, GPA, age, number of employees, salary, and full-time job offer. However, only one of these independent variables, salary, was statistically significant in predicting the personal, professional, and career value of the internship experience.

Multiple linear regression analysis was also applied to determine if a combination of scale and dichotomous independent variables predicted the perceived degree of satisfaction with the internship experience better than any one independent variable alone. The purpose of this regression analysis was to predict a scale level dependent variable, satisfaction with the internship experience, from a combination of several scale and dichotomous independent or predictor variables, gender, GPA, age, number of employees, salary, and full-time job offer. Again, only one of these independent

variables, salary, was statistically significant in predicting the satisfaction of the internship experience.

As a result of qualitative analysis the definition of a core category that represents the central phenomenon or main theme emerged as follows: Students must assume personal responsibility for selecting and preparing for the internship experience and ensure job duties, learning outcomes, employment benefits, responsibilities of all stakeholders, and assessment of learning are clearly established to provide an opportunity to apply classroom learning to real-life situations and ensure value of and satisfaction with the occupational safety and health internship experience.

Comparison with Kraemer Study

The current study is a replication of the Kraemer study conducted in 1992. The research sample in the Kraemer study consisted of Murray State University bachelor's and master's degree graduates from 1978-1991 in the occupational safety and health program who had completed at least one internship experience. The sample in the current study consisted of bachelor's and master's degree graduates from 1997-2001 in occupational safety and health degree programs from one of five ABET accredited university programs who had completed at least one internship.

Although Murray State offers an ABET accredited occupational safety and health program, Kraemer's first recommendation for future research was to conduct his study on a larger population of ABET accredited occupational safety interns to allow for more generalizability of the research findings (Kraemer, 1992). This study satisfied that recommendation by extending the Kraemer study to all five universities that offered ABET accredited degree programs in occupational safety and health at the bachelor's

and/or the master's degree levels. These universities are Indiana University of Pennsylvania, Marshall University, Millersville University of Pennsylvania, Murray State University, and West Virginia University. Each of these universities saw value in the current research and agreed to participate in this study.

The typical occupational safety and health intern in the Kraemer study was 24.33 years old, white (93.6%), male (78%), single (80.3%) who completed his first internship while receiving a bachelor's degree. The typical intern in the current study was a very similar 25.13 year old, white (95.8%), male (79.2%), single (80.6%) who completed his internship as an undergraduate.

In both studies, the typical internship sites were manufacturing, other sites, government and chemical with over half the interns working as generalist. The average salary was \$8.14 per hour in the Kraemer study and \$10.12 per hour in the current study. When the average salary of \$8.14 per hour in 1992 is adjusted for inflation based on the Consumer Price Index, that value becomes \$10.16 in 2001, see <http://www.westegg.com/inflation/>. Of the 173 participants in the Kraemer study, 57 (32.9 %), received job offers from their internship employer following graduation. Of the 192 participants in the current study, 73 (38 %), received job offers following graduation.

The mean score for the interns' perceived degree to which the internship experience provided personal, professional, and career value in the current study was 4.11 (SD .93) compared to a similar finding of 4.27 (SD 2.44) on this same scale in the Kraemer study. In both studies, these scores indicate the research study participants were in moderate to strong agreement that the internship provided personal, professional, and career value.

Each of the 18 identified internship attributes were rated by the participants in the current and the Kraemer study as somewhat important to very important with a mean score in the current study of 4.31 (SD .91) and a mean score in the Kraemer study of 4.51 (SD .79). Nine out of the top 10 most important internship attributes were the same in both studies. Although ranked somewhat differently within the top 10 most important attributes, two of the top three highest ranked attributes in both studies were learning skills from experience and gaining confidence in technical skills.

The mean-summed score for satisfaction with the important attributes of the internship experience was lower than the value and importance scores in both studies with a mean of 3.85 (SD 1.02) in the current study and a mean of 3.96 (SD .60) in the Kraemer study. In both cases, these scores indicate the participants were neither satisfied nor dissatisfied to somewhat satisfied with the internship experience. The current study expanded the Kraemer study by evaluation the satisfaction level of each of the top 10 most important internship attributes. Eight of the ten most important internship attributes were also among the ten highest ranked internship attributes in satisfaction with the internship experience in the current study. However, two of the ten most important attributes received low mean scores on the satisfaction scale accounting for the lower overall mean average for satisfaction. Receiving on-site orientation was the number five ranked important internship attribute but ranked 13 of 18 on the mean satisfaction scale. Having a well-defined job description ranked seventh in importance while scoring a low mean satisfaction score that ranked 16 of 18.

In both the current and the Kraemer studies, significant positive correlations were found between the salary earned by interns and the personal, professional, and career

value scores, and the salary earned by the interns and the level of satisfaction scores of the occupational safety and health internship experience.

A significant difference was found at the $p < .05$ level between the perceived value of the internship experience and the various internship sites in both the current study and in the original Kraemer study. The difference between the chemical classification and the service industries, and the difference between construction/mining sites and the service industries were statistically different in the current study. In the Kraemer study, chemical, manufacturing, and other sites were statistically significantly different and preferred over the service industries sites. In combined studies results, the chemical, manufacturing, other, construction, and mining industries were clearly preferred internship sites over the service industry sites (consulting, food, and insurance industries).

The current study was expanded to look for differences between female and male interns relative to perceived importance of the internship experience, internship salary, and bachelor's degree GPA and the perceived degree to which the occupational safety and health internship experience provided value. An independent t test demonstrated that the internship experience was significantly more important to female than to male interns. No other differences between the genders were statistically significant on the perceived degree to which the internship provided personal, professional, and career value.

Multiple linear regression analysis was applied in both studies to determine if more than one independent variable at a time provides additional information to predict the personal, professional, and career value of or satisfaction with the internship experience better than any one independent variable alone. In both the current and

Kraemer studies, only one of these independent variables, intern salary, made a significant contribution over and above that of the other variables in combination in predicting the personal, professional, and career value of or satisfaction with the internship experience.

One of the recommendations for future research in the Kraemer study was to conduct qualitative studies with occupational safety and health interns to assess strengths and weaknesses of the internship program. The current study adopted that recommendation and expanded the qualitative data analysis of the survey research questionnaire data through a constant comparative analysis technique. This qualitative analysis provided a rich source of information on strengths and weaknesses of the internship experience that did not surface from quantitative analysis of survey questionnaire data in either the current or the original Kraemer study. These qualitative emergent findings were listed in Chapter IV and were applied in the conclusions and recommendations sections of this chapter.

As to the recommendation for future research made by Kraemer (1992) to replicate his study at Murray State University and other universities with ABET accredited degree programs in occupational safety and health to allow for more generalizability of any future study results, it is apparent from the consistency of results between the current and the original Kraemer study that the original Kraemer results (1992) are representative of the larger population of all five ABET accredited degree programs in occupational safety and health. These results indicate that the Kraemer Internship Survey Questionnaire (1992) is a reliable research instrument to determine

intern value of and satisfaction with the occupational safety and health internship experience.

Discussion of Conclusions

The results of this study were used to assess the perceptions of the internship experience of graduates on five ABET accredited university programs in occupational safety and health, to determine those attributes that contributed most to a worthwhile occupational safety and health internship experience, and to determine those demographic and internship characteristics that contributed most to the satisfaction of that internship experience. These results reflect only the perceptions of the internship experience at ABET accredited degree programs in occupational safety and health and may not be representative of interns from non-ABET accredited programs in occupational safety and health or interns in other engineering or healthcare-related degree programs. However, these results and conclusions may be of interest and useful to college or university degree programs considering ABET accreditation for a degree program in occupational safety and health or other engineering or healthcare-related degree programs.

The following conclusions are based on the current study survey questionnaire data analysis, comparison of the current study results to the Kraemer (1992) study results, and research support in the review of literature.

Reliability of the Instrument

As documented in the previous section of this chapter, the current study results are very similar to the original Kraemer study results with no significant variances in the findings of each study. The number of participants in each study was similar, 173 in the

Kraemer study and 193 in the current study. In both studies the research sample was made up of graduates of ABET accredited degree programs in occupational safety and health that had completed at least one internship.

The reliability of the survey questionnaire instrument developed by Kraemer (1992), and used in this study, was affirmed by a Kraemer pilot study, the Kraemer survey research results, and the current survey research results. In each of these measures of reliability, the Cronbach alphas were high (Gliner & Morgan, 2000) for each of the summed scales from the survey questionnaire designed to measure personal, professional, and career value of the internship, importance of internship attributes, and satisfaction with these important attributes of the internship experience. These results indicate a high level of item correlation and good internal consistency of the survey instrument.

This high level of internal consistency, coupled with verified reproducibility of research results from this study, indicates that the Kraemer Internship Survey Questionnaire (1992) is a reliable research instrument to determine intern value of and satisfaction with the occupational safety and health internship experience and to identify key internship attributes that are contributing to the strength or weakness of an ABET accredited occupational safety and health internship experience.

It is concluded that ongoing administration of the Kraemer Internship Survey Questionnaire to students completing an occupational safety and health internship should provide colleges and universities a means to evaluate the experience, assess student learning outcomes, and improve the internship experience to the benefit of students, employers, and the institution of higher education. In addition, administration of the Kraemer survey research instrument to participants in ABET accredited occupational

safety and health degree programs should provide strong evidence of the level of learning and the value on the experiential learning component required in the ABET outcomes-based accreditation process (ABET, 2001).

Based on research results at the University of Cincinnati and Northeastern University (Canale, Cates, & Duwart, 2000) it is concluded that additional evidence of the learning outcomes that occur through an ABET accredited occupational safety and health internship experience could also be provided by ongoing, concurrent administration of the survey research instrument developed by Cheryl Cates at the University of Cincinnati (C. Cates, personal communication, May 28, 2002). This survey research instrument (See Appendix F, Survey – ABET 2000 by C. Cates) is providing the University of Cincinnati and Northeastern University with evidence of student development of the ABET required attributes that supports ABET outcomes-based accreditation at these universities. In order to use the Cincinnati instrument in an ABET accredited occupational safety and health program, it must be modified to reflect the ABET established attributes of a safety-related graduate from the current survey reflection of the ABET established attributes of an engineering graduate.

Internship Value and Satisfaction

The occupational safety and health program graduates of the five ABET accredited degree programs were in strong agreement that the internship experience provided personal, professional, and career value to their educational experience. Many commented that the internship was the most valuable and most important part of their undergraduate experience. The graduates saw the internship experience as valuable in providing the opportunity to apply classroom learning to real-life situation, developing

basic communications and people skills, determining career direction and employment opportunities, learning new technical skills, and building resume'-quality experience. Both quantitative and qualitative results make it an obvious conclusion that the ABET accredited occupational safety and health internship experience is of great value to the graduates of the five universities offering these programs, with one caveat.

The level of satisfaction with selected important characteristics or attributes of the internship experience was not as high as the value score and indicated the interns were neither satisfied nor dissatisfied to somewhat satisfied with these important attributes of the internship. Although eight of the top ten perceived most important attributes of the internship were also in the top ten attributes perceived to be most satisfying, two of the top ten most important internship attributes were ranked very low on the satisfaction scale. Without these two low scores, the mean satisfaction score would have indicated the interns were somewhat to very satisfied with the top ten most important attributes of the internship experience.

These two important, low satisfaction-ranked attributes of the internship were: receiving on-site orientation, and having a well-defined job description. Both of these attributes should have been addressed in the preparation phase before the work phase of internship was ever undertaken. It is apparent, from both the quantitative and the qualitative findings, that the university preparation of their students for their internship is, in some cases, lacking and that some students are not assuming personal responsibility for their learning opportunity provided by the internship experience.

In addition, these findings indicate that some of the intern employers are not providing a quality internship learning experience. The ultimate responsibility for this

employer failing is with the institution of higher education. For the internship to be an effective outcomes-based learning experience, the responsibilities for all stakeholders, students, employer, and university, must be clearly defined by the institution of higher education and must clearly address the key attributes of the internship and the established learning outcomes.

Although there is a statistically significant positive quantitative correlation between intern salary and perceived value of and satisfaction with the internship experience, the qualitative results lead to the conclusion that low intern compensation (salary, travel reimbursement, housing, bonuses, or other benefits) has a clear relationship to both perceived low value of and satisfaction with the internship, but that acceptable to high compensation does not necessarily have a positive effect on the perceived value of and satisfaction with the internship experience. These qualitative results indicate that when the intern perceived value of and satisfaction with the internship experience are high, other key internship attributes such as involvement with management and other employee while performing challenging work assignments were the reasons for the high levels of value and satisfaction.

Of the 188 respondents to the current study, 34 (18.1 %) received no salary compensation for their internship work and an additional 3 (1.6 %) received less than minimum wage for their internship work. It is reasonable to assume that these interns are the same 19.7 percent of the respondents that rated satisfaction with their internship compensation from very dissatisfied to neither satisfied nor dissatisfied. There is no indication in the qualitative findings that these low earning level were offset by any other form of compensation. Therefore, it is concluded that low intern compensation was

directly related to low levels of value and satisfaction with the internship and that high levels of compensation are not necessarily related to high levels of value and satisfaction for the internship experience.

The internship site location also had a positive correlation with both the perceived value of and the perceived satisfaction with the internship experience. Again the qualitative data analysis provided insight as to why the statistically significant quantitative differences existed between manufacturing, other sites, government, and chemical sites when compared to service industry internship sites (consulting, food, and insurance industry sites). It appears from both the qualitative analysis and the Kraemer (1992) conclusions relative to similar findings that lower average salary, longer working hours and travel times, lack of internship structure, less well-defined job duties, limited opportunities to work with others, and performing less challenging work at these service industry sites may account for the lower levels of value and satisfaction. It is reasonable to conclude that a lack of student research into the job duties as they relate to the student's personal and professional development interests and needs, a lack of internship structure and definition of stakeholder responsibilities, and the lack of well-defined learning objectives may have been the root cause of dissatisfaction with the service industry internship sites.

Other Key Internship Attributes

The internship survey questionnaire identified 18 important characteristics or attributes for a successful internship experience which are based on original research in the Kraemer (1992) dissertation, see survey questions 15-32 in Appendix A. This study, and the original Kraemer study, focused on the attributes that were perceived by the

research sample population as being most important and those providing greatest satisfaction or dissatisfaction. The findings and discussions to this point have addressed the top ten most important and the top ten most satisfying attributes of the internship experience. For the most part, the most important attributes were also the most satisfying attributes in the top ten of each category. Two important exceptions were discussed above as important attributes that received low satisfaction scores: receiving on-site orientation, and having a well-defined job description. Other attributes that received lower levels of importance and satisfaction were not discussed in the original Kraemer study but have been addressed in this study.

Although eight of the 18 attributes were rated at lower levels of importance than the top ten, these bottom eight rated attributes were rated at an mean importance score of 4.11 (SD .97) indicating the respondents perceived these attributes to be somewhat to very important. It is important to note that seven of these eight lowest importance rated attributes should be addressed in the preparation phase of the internship experience before the work phase is started: taking responsibility, exploring career interests, identifying personal strengths and weaknesses, compensation benefits, contact with faculty coordinator, special training required, and pre-employment information. The corresponding low satisfaction scores, see Table 11, related to these eight lowest rated importance attributes indicates a need for attention to the preparation phase on the internship experience.

It is reasonable to conclude, from both the quantitative and the qualitative findings, that the university preparation of their students for the internship work experience is, in some cases, lacking and that some students are not assuming personal

responsibility for researching and understanding key internship attributes before reporting for their internship work assignments. It is further concluded that this lack of student research into the job duties as they relate to the student's personal and professional development interests and needs, and a lack of internship structure and definition of stakeholder responsibilities, may explain the dissatisfaction associated with internship attributes that could effectively be addressed in preparation for the internship experience.

Recommendations

The following recommendations are based on the current study research findings, the conclusions drawn from these findings, and research support found for these conclusions in the review of literature.

Recommendations for a 21st Century Internship

The following recommendations for a proactive, interactive 21st century internship model are based on the current study research findings, the conclusions drawn from these findings, and research support found for these conclusions in the review of literature. This internship model address each of the 18 important characteristics or attributes identified by Kraemer (1992) for a worthwhile occupational safety and health internship experience, applies the results of the qualitative findings of this study, incorporates the recommendation developed by the National Commission for Cooperative Education (NECC, 2002c), includes key elements of the Northeastern University and the University of Cincinnati internship programs (Canale, Cates, & Duwart, 2000), and satisfies the American Society of Safety Engineers (ASSE) *Standard Guidelines for Academic Internship Programs for Safety, Health, and Environmental Curriculum* (ASSE, 2002).

The four-phased approach for this proactive and interactive occupational safety and health internship model includes a:

- 1. Preparation Phase**
- 2. Learning Contract**
- 3. Work Phase with Active Reflection**
- 4. Formal Reflection Phase**

The Preparation Phase addresses many of the findings in this study that contributed to the lack of perceived value of and satisfaction with the occupational safety and health internship experience, includes key elements of the Northeastern University (2002) and the University of Cincinnati (2002) internship programs, and incorporates the ASSE internship guidelines (ASSE, 2002). It is recommended that the preparation phase be carried out as a one credit-hour prerequisite course conducted the semester prior to the internship work phase. The objectives of the preparation phase are that the intern:

- 1. understands the concept of experiential learning along with the purpose, the mechanics, and the expectations of the internship experience;**
- 2. understands diversity issues and the importance of being a team player;**
- 3. becomes knowledgeable of contemporary safety, health, and environmental issues within a global society context;**
- 4. understands the student intern's role and responsibilities, to include the ASSE Code of Professional Conduct;**
- 5. understands the importance of the intern assuming personal responsibility for the learning outcomes associated with the internship experience;**

6. understands the expectations, roles, and responsibilities of the faculty internship coordinator and internship site supervisor;
7. understands the assessment of learning activities and the evaluation criteria;
8. assesses his/her personal, professional, and career needs, skills, abilities, interests, ethics, and values;
9. learns about options and opportunities within the occupational safety and health career field;
10. researches potential employer and obtains pre-employment information to include brochures, videos, and web site information to include the company's mission, vision, and safety policy statement;
11. evaluates, compares, and contrasts potential internship employers and potential intern positions using well-defined job descriptions;
12. determines availability of a safety professional on site to act as a mentor;
13. understands compensation and employees benefits on the internship position to include salary, travel reimbursement, housing, personal protective equipment, liability, insurance, and other pertinent employment issues;
14. assesses, through research and the interview process, management's overall commitment to safety and commitment to participating in students' education through the experiential learning process;
15. aligns self-assessment with objective reality of the internship opportunities available;
16. practices problem solving and decision making skills;
17. produces a professional resume';

18. becomes knowledgeable of and demonstrates effective interviewing skills; and
19. develops short and long-term personal, professional, and career goals.

The Learning Contract utilizes the information gathered in the Preparation Phase to document a clear understanding of key internship attributes, relationships, and responsibilities that, when not understood or agreed to, may become a major source of dissatisfaction with the internship experience. The Learning Contract maximizes the internship outcomes for each stakeholder; intern, employer, and university. This formal agreement of stakeholder responsibilities should include:

1. A detailed job description outlining the productive work to be performed and the learning environment in which the work will be conducted.
2. A list of detailed learning objectives based on ABET Program Outcomes for a safety-related applied technology program.
3. All of the below listed ABET-established outcomes for safety-related programs at the bachelor's and master's degree levels should be addressed in the learning objectives for the internship experience:
 - a) an ability to apply knowledge of mathematics and science;
 - b) an ability to analyze and interpret data;
 - c) an ability to anticipate, identify, and evaluate hazardous conditions and practices;
 - d) an ability to develop hazard control designs, methods, procedures, and programs;
 - e) an ability to function on multi-disciplinary teams;
 - f) an understanding of ethical and professional responsibility; and

- g) knowledge of contemporary issues within a global society context.
- 4. A detailed outline of intern, internship site coordinator, and faculty coordinator responsibilities for the internship experience.
- 5. An explanation of the evaluations of the internship experience required by the intern, internship site coordinator, and faculty coordinator.
- 6. An explanation of the grading criteria used in assessing the student internship accomplishments.

Based on the review of literature, many internships are completed with little or no formal reflection on the learning experience by the student intern. Reflection is a key element in experiential learning and will be incorporated in the work phase as well as in the Formal Reflection Phase of this internship model. The reflections will be guided by the faculty internship coordinator and will connect the intern with the site coordinator and faculty via a web-based internship course platform. In the Work Phase with Active Reflection of the internship experience, the major objectives are that each student (ASSE, 2002; Northeastern University, 2002):

1. works in a career related position toward well-defined learning outcomes;
2. seeks and accepts higher levels of complexity in work assignments;
3. becomes a productive member of the workplace and interacts effectively with all levels of employees;
4. communicates verbally and in writing with team members, supervisors, and others in the workplace;
5. works with a diversity of individuals and organizations in both the workplace and in the community;

6. becomes proficient in information literacy and technological tools;
7. performs responsibly in his/her personal and professional actions both on the job and in the community;
8. performs professionally in all job assignments, work environments, and in relationships with others on and off the job site;
9. connects course work to internship assignments, theoretical to applied, college to the world of work, college study to lifelong learning, and reflects on this experience via web-based communications on a bi-weekly basis;
10. reports progress and problems associated with established learning objectives via web-based communications linking intern, site coordinator, and faculty coordinator on a bi-weekly basis; and
11. participates in bi-weekly faculty lead web-based discussions questions relative to the internship learning experience.

The Formal Reflection Phase is completed after the Work Phase with Active Reflection Phase of the internship has been completed. During this formal reflection, the student will articulate the personal, professional, and career growth that occurred during the work phase. It is during this Reflection Phase that the student will formally make the connection between classroom and experiential learning. This reflection will be in the form of a professional paper due in the school term following the internship. The major objectives for the Reflection Phase are that each student (Northeastern University, 2002):

1. makes connections between course work and the internship work experience,
2. makes connections between the theoretical and the applied,
3. makes connections between college and the world of work,

4. makes connections between college study and lifelong learning,
5. understands the internship job, work environment, and relationships with others,
6. identifies and understands ethical dilemmas in the workplace,
7. understands how to work with a diversity of individuals and organizations,
8. understands and strengthens decision making skills, and
9. understands and articulates the evolving technology, global issues and associated implications.

Recommendations for Stakeholders

The following stakeholder recommendations are based on the current study research findings, the conclusions drawn from these findings, and research support found for these conclusions in the review of literature. These recommendations are directed at enhancing graduates' perceptions of the personal, professional, and career value of and satisfaction with the internship experience of ABET accredited degree programs in occupational safety and health.

Although it is clear in the review of literature that the internship experience has significant advantages for all stakeholders, student interns, employers, and institutions of higher education (NCCE, 2002b), the primary purpose of the internship is to provide a means of bridging the gap between the intern's classroom education and the actual workplace (ASSE, 2002). The following recommendation for students will assist in making this transition through an occupational safety and health internship experience effective:

- 1. Take personal responsibility for carefully researching, selecting, preparing for, participating in, and learning from this important education component of an ABET accredited occupational safety and health curriculum.**
- 2. Insist on a well-defined job description, clearly stated learning objectives, defined communications and reporting responsibilities, availability of a safety professional on site mentor, and understanding of the evaluation and assessment of learning process.**
- 3. Make sure the internship compensation and employment benefits are acceptable from a personal standpoint.**
- 4. Assume personal responsibility for defining and accomplishing detailed experiential learning objectives that align with the educational outcomes expected of a graduate from an ABET accredited program in occupational safety and health. Do not assume that it is the faculty or internship site coordinator's responsibility to ensure you have an effective, outcomes-based learning experience.**
- 5. Prepare for the internship experience by acquiring knowledge of the safety and health-related issues of both the specific internship site and the industry in general in which you will be working, and review the appropriate safety, health, and environmental regulations of greatest concern to that industry.**
- 6. Get involved. Seek and accept higher levels of complexity in work assignments and take advantage of opportunities to interact with management and employees at all levels in the workplace.**

7. Review the occupational safety and health graduates' responses to the open-ended questions of the survey research questionnaire found in Appendix E. These qualitative responses provide insights, in the respondents' own words, that reflect aspects of the internship that resulted in value of and satisfaction or dissatisfaction with their internship experience that are not evident in the quantitative analysis and may be of great value to students preparing to undertake an internship in occupational safety and health.

The National Safety Council (2001a), the American Society of Safety Engineers, and the Board of Certified Safety Professionals (ASSE & BCSP, 2000) have all recognized one of the challenges of tomorrow as being the need for the safety profession to obtain individuals with the education necessary to compete and work effectively in the safety and health career field. This challenge can best be met by the colleges and universities offering ABET accredited degrees in occupational safety and health. A required and very important part of those accredited degrees is the experiential learning component of the curriculum.

Employers need to understand the very important role they need play in partnering with accredited colleges and universities to ensure a high quality educational experience that will meet the projected demands for qualified safety professionals in the 21st century. The following recommendations for employers will assist in bridging the gap from classroom to the workplace and ensuring an effective transition for the occupational safety and health intern while providing valuable and meaningful work assistance to the employer:

- 1. Partner with colleges and universities offering ABET accredited occupational safety and health degree programs to support the development and implementation of high-quality internships essential for the educational preparation on 21st century safety and health professionals.**
- 2. Recognize the 18 important characteristics or attributes necessary for a worthwhile internship experience identified by Kraemer (1992). These attributes will not only ensure a valuable learning experience for the intern, but will result in an intern capable of performing important and challenging work assignments with direct benefit to the employer.**
- 3. Recognize the ABET-established attributes of a graduate from an ABET accredited safety-related degree program and work with the institution of higher learning to incorporate the learning outcomes necessary to support development of those safety professional attributes during the internship experience.**
- 4. Review the findings of this study and recognize the importance of the key internship characteristics or attributes that are directly related to the intern employer and the internship site coordinator to include the following: learning and gaining confidence in safety-related skills from experience, intern compensation (salary, housing, travel reimbursement, and other employment benefits), interaction with management and all levels of employees at the work site, on-site orientation, a well-defined job description, a variety of challenging safety-related work assignments, and working with a safety professional mentor onsite.**

5. **Review the occupational safety and health graduates' responses to the open-ended questions of the survey research questionnaire found in Appendix E. These qualitative responses provide insights, in the respondents' own words, that reflect aspects of the internship that resulted in value of and satisfaction or dissatisfaction with the internship experience that related to the intern employer and internship site coordinator that are not provided through the quantitative analysis.**
6. **Actively participate with the faculty internship coordinator and the student intern in the intern's ongoing, actively reflection on the work experience as it relates to classroom learning, and participate in the evaluation and assessment of student intern's experiential learning progress.**
7. **Become an active participant with the college or university internship coordinator in reflecting on the internship experience and recommending means to improve the intern learning experience and to ensure a valuable benefit to the employer.**
8. **Work with the ABET accredited colleges or universities offering occupational safety and health degree programs to develop longer-term partnerships to research safety and health issues that are site or industry-specific which could provide ongoing intern and faculty involvement to increase the body of knowledge relative to these issues for the benefit of both employer and industry.**

The following recommendations for ABET accredited university degree programs in occupational safety and health, or for colleges or universities considering ABET

accreditation, should assist in making the required experiential learning/internship component of the curriculum more effective and help ensure student success in connecting the classroom and the workplace:

1. **Adopt and implement the four-phased 21st century internship model recommended as a result of findings of this study. This model incorporates recommendations by the National Commission for Cooperative Education (NECC, 2002c); key experiential learning components of two of the nation's leaders in cooperative education, Northeastern University (n.d.) and the University of Cincinnati (2002); and satisfies ASSE guidelines for an academic internship program in occupational safety and health (ASSE, 2002).**
2. **Make students and intern employers working partners in developing internship learning outcomes that meet individual students' personal, professional, and career needs and the ABET-established outcomes thereby insuring a high-quality internship experience that provides value and satisfaction with this important aspect of the students' college experience.**
3. **Recognize the 18 important characteristics or attributes necessary for a worthwhile internship experience identified by Kraemer (1992) and the ABET-established attributes (ABET, 2001) of a safety-related graduate in developing internship learning objectives that will ensure value of and satisfaction with the internship and support development of the ABET-established attributes of a safety-related graduate during the internship experience.**

4. **Work with internship stakeholders to establish clear duties and responsibilities for student interns, internship site coordinators, and faculty coordinators to ensure an effective outcomes-based internship learning experience.**
5. **Diligently select internship sites applying the site selection guidelines established by ASSE (2002), and assume ultimate responsibility for any employers failing to provide a suitable internship educational experience and take appropriate corrective action.**
6. **Examine the results of this study and initiate appropriate changes in the occupational safety and health internship that may be required. Review the occupational safety and health graduates' responses to the open-ended questions of the survey research questionnaire found in Appendix E. These qualitative responses provide insights that reflect aspects of the internship and perceived responsibilities of the student interns, internship site coordinators, and faculty coordinators that are not found in the quantitative analysis.**

Needs for Future Research

The needs for future research are based on the current research findings and conclusions supported by research findings from the review of literature:

1. **Conduct a similar study of the same five ABET accredited degree programs with modification of the internship survey questionnaire to allow for identification of the individual university to determine if significant differences exist between the various universities interns' perceptions of the personal, professional, and career value of the internship experience or the perceived satisfaction with key attributes of the internship. The survey**

instrument should be administered to a sample population immediately following the internship experience in the same academic year and not to a sample population spread over several years as was the case with the current and the original Kraemer studies. Qualitative data gathered in the current study suggests that such differences may be significant. The survey questionnaire in Appendix A, modified as recommended, should be used to gather data, and similar methodology used as described in the current study, to allow for comparison of findings with results of this study, the original Kraemer study, and between the various universities.

2. Conduct similar studies annually at one or more of the same five ABET accredited degree programs in occupational safety and health to assess how the program interns are responding to curriculum and/or internship programmatic changes that may be occurring in this emerging career field with a university degree preparation recently subject to new outcomes-based ABET accreditation criteria. The survey questionnaire in Appendix A should be used for consistency and comparison purposes. This recommended study may ascertain the value of outcomes-based educational criteria in meeting the maturing needs of the 21st century occupational safety and health professional.
3. Conduct a combination quantitative, qualitative research study directed at identifying the characteristics, structure, and key components necessary for a successful university internship program in occupational safety and health using the recommendations for a proactive, interactive internship experience found in this study as the basis for comparison and analysis. Recommended

data collection is based on administration of a survey questionnaire using elements of the internship survey questionnaire, as modified for this study, and the University of Cincinnati survey instrument coupled with qualitative research interviews of student interns as part of the formal reflection phase of their internship experience. Results from this study may provide internship stakeholders with significant common ground to identify key elements of the internship experience that could add value and benefits to student interns, employers, and the university involved.

4. Conduct a qualitative research Case Study (Creswell, 1998) at one or more of the five ABET accredited university degree programs in occupational safety and health to develop a greater, in-depth understanding of the internship characteristics that contribute to student development through experiential learning than may have occurred through the primarily quantitative approach used in the current study. Qualitative data gathered and analyzed in this study supports recent findings by Coll and Chapman (2000) that suggests qualitative analysis of the experiential learning may result in greater depth of inquiry than the primarily quantitative results reported in this and the original Kraemer studies.
5. Use the internship survey questionnaire, as modified for this study, to conduct similar studies at non-ABET accredited occupational safety and health university programs to determine similarities and differences in the perceived personal, professional, and career value of the internship experience and the perceived level of satisfaction with key characteristics or attributes of the

internship. This recommended study may answer current questions by safety - related university program educators as to the value, or lack of value, in the ABET accreditation process.

6. Use an abbreviated version of the internship survey questionnaire, as modified for this study, (Sections A and B only) and similar analytical methods to concurrently compare and contrast the student interns' and the internship site coordinators' perceptions of the importance of and satisfaction with the identified characteristics or attributes of a worthwhile internship experience in occupational safety and health. This study may lead to better understanding and appreciation of key elements of an effective internship and provide a basis for greater cooperation between the stakeholders resulting in a more productive educational partnership in the future.
7. Modify the University of Cincinnati *Survey – ABET 2000 “Attributes of an Engineer”* research instrument developed by Cheryl Cates to reflect the ABET-established attributes of a graduate of an ABET accredited safety-related bachelor's or master's degree program. Use this modified research instrument to assess recent graduates' perceptions of learning outcomes established by ABET. Compare and contrast results of this study with the results from similar studies at the University of Cincinnati and Northeastern University to provide continuing evidence of experiential learning outcomes to support ABET accreditation.

Summary of Conclusions and Recommendations

There are currently excellent career opportunities for students who are involved with internship programs. Business and industry are now placing emphasis on education and training of the workforce for a new millennium. Partnerships between institutions of higher education and both public and private sector employers abound. These highly interdependent collaborations will likely move education to a new level of excellence (Hall, 1999; NSC, 2001a; Equinoa & Shibata, 1998). However, quality assurance must be maintained within cooperative education work experiences so that credibility with accrediting bodies, like ABET, is upheld (ABET, 2001; NCCE, 1999).

Research shows that many internship/cooperative work experience programs are effective (Premont, 1998), but it is not merely being physically present at a work site that leads to a meaningful and satisfactory work experience (Canale & Duwart, 1999; Northeastern University, 2002; Page, Geck, & Wiseman, 1999). There is a need to identify the elements of an internship experience that contribute most to student learning. Programs that provide internship experiences need to know what job site characteristics to look for, plan for, and monitor (Kraemer, 1992; Wilson, 1997).

An assessment of graduate perceptions of the internship experience may provide information needed in developing or revising internship programs at colleges and universities with ABET accredited occupational safety and health degree programs. Student perceptions of the experiential learning component of their ABET accredited education is an essential part of the ongoing ABET accreditation process and may provide universities with support basis for accreditation of their internship program (Canale et al., 2000).

Administration of the Kraemer Internship Survey Questionnaire, as modified for this study, to students completing an occupational safety and health internship should provide colleges and universities a means to evaluate the experience, assess student learning outcomes, and improve the internship experience to the benefit of students, employers, and the institution of higher education. In addition, administration of the Kraemer survey research instrument to participants in ABET accredited occupational safety and health degree programs should provide strong evidence of the level of learning and the value on the experiential learning component required in the ABET outcomes-based accreditation process (ABET, 2001). Additional evidence of the learning outcomes that occur through an ABET accredited occupational safety and health internship experience may be provided by ongoing, concurrent administration of the survey research instrument developed by Cheryl Cates at the University of Cincinnati.

The occupational safety and health program graduates of the five ABET accredited degree programs were in strong agreement that the internship experience provided personal, professional, and career value to their educational experience. Graduates saw the internship experience as valuable in providing the opportunity to apply classroom learning to real-life situation, developing basic communications and people skills, determining career direction and employment opportunities, learning new technical skills, and building resume'-quality experience. However, key findings in this study indicate that lower average salary, longer working hours and travel times, lack of internship structure, less well-defined job duties, limited opportunities to work with others, and performing less challenging work at service industry sites may account for the lower levels of value and satisfaction with the internship experience.

Although there is a statistically significant positive quantitative correlation between intern salary and perceived value of and satisfaction with the internship experience, the qualitative results lead to the conclusion that low intern compensation (salary, travel reimbursement, housing, bonuses, or other benefits) has a clear relationship to both perceived low value of and satisfaction with the internship, but that acceptable to high compensation does not necessarily have a positive effect on the perceived value of and satisfaction with the internship experience. These qualitative results indicate that when the intern perceived value of and satisfaction with the internship experience are high, other key internship attributes such as involvement with management and other employee while performing challenging work assignments were the reasons for the high levels of value and satisfaction.

The qualitative analysis of responses to the open-ended questions on the survey questionnaire provided significant insights to the graduates' perceived value of and satisfaction with the internship experience that were not found through the quantitative analysis of the survey data. The main theme which emerged from the major qualitative constructs was as follows: Students must assume personal responsibility for selecting and preparing for the internship experience and ensure job duties, learning outcomes, employment benefits, responsibilities of all stakeholders, and assessment of learning are clearly established to provide an opportunity to apply classroom learning to real-life situations and ensure value of and satisfaction with the occupational safety and health internship experience.

The recommendations for a proactive, interactive 21st century internship model are based on the current study research findings, the conclusions drawn from these

findings, and research support found for these conclusions in the review of literature. This internship model addresses each of the 18 important characteristics or attributes identified by Kraemer (1992) for a worthwhile occupational safety and health internship experience, applies the results of the qualitative findings of this study, integrates the ABET-established attributes for a safety-related graduate, incorporates the recommendation developed by the National Commission for Cooperative Education (NECC, 2002c), includes key elements of the Northeastern University and the University of Cincinnati internship programs (Canale, Cates, & Duwart, 2000), and satisfies the American Society of Safety Engineers *Standard Guidelines for Academic Internship Programs for Safety, Health, and Environmental Curriculum* (ASSE, 2002). The four-phased approach for this proactive and interactive internship model consist of a: Preparation Phase, Learning Contract, Work Phase with Active Reflection, and a Formal Reflection Phase.

The adoption and implementation of the 21st century internship model by ABET accredited programs in occupational safety and health, or by colleges and universities considering ABET accreditation, will take full advantage of the findings in this study. The related and supporting recommendations for student interns, intern employers, and universities offering these internship programs should enhance the graduate perceived value on and satisfaction with the occupational safety and health internship experience. Additional research is needed to develop and expand the body of knowledge necessary to ensure ABET accredited colleges and universities are providing the best possible experiential learning component of the future safety professional's college experience.

The Kraemer developed Internship Survey Questionnaire, as modified for this study, provides a statistically reliable means for evaluating the value of and satisfaction with key attributes of an occupational safety and health internship experience and its use should be expended as a basis for several of the recommended future research projects. Future research into experiential learning will also be enhanced through use of the University of Cincinnati *Survey – ABET 2000 “Attributes of an Engineer”* research instrument developed by Cheryl Cates and through the increased application of the qualitative research methods suggested in the future needed research section of this dissertation.

Learning outcomes of every aspect of today’s educational experience is the focus of both public and private sector educational stakeholders. Although the current research findings may be particularly helpful to the occupational safety and health profession, they may also serve as a framework for examining perceptions of internship experiences for the health education professions, as well as other career and technical education fields. Ongoing survey research of the student/recent graduate perceptions of the value of and satisfaction with their educational experiences will continue to play an important role in the assessment of an outcomes-based educational experience.

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APPENDICES

Appendix A: Internship Survey Questionnaire

**INTERNSHIP
Survey Questionnaire
of
Occupational Safety and Health Graduates**

GENERAL INFORMATION AND DIRECTIONS

1. The following pages of the Internship Survey Questionnaire list statements and questions regarding graduates' perceptions of the internship experience. The survey is divided into two parts. Part I contains the Demographic data and intern information and Part II represents various internship perceptions. Specific directions for each part are included at appropriate locations within the Survey Questionnaire.
2. Erase clearly any answer you wish to change.
3. Do not put your name, date, social security number or any other identifying marks on the questionnaire.
4. Please return the completed questionnaire form within five working days of receipt in the self-addressed, postage paid envelope to:

Charles W. McGlothlin, Jr.
120 Fisher Drive
Trinidad, CO 81082
5. Mail the response verification postcard indicating you have completed the questionnaire separately from the questionnaire. By doing so, I will eliminate your name from the follow-up.

THANK YOU FOR YOUR PARTICIPATION IN THE SURVEY.

PART I. - DEMOGRAPHIC DATA AND INTERN INFORMATION

Please provide the following personal data. The information is essential for proper analysis of the questionnaire. All data will be considered strictly confidential.

Directions:

- Check or fill in the answer which best describes you. Please note that survey questions are on both sides of these pages.
- Do not put your name, date or any other identifying information on the questionnaire.

1. Gender
 Female
 Male
2. Race
 American Indian
 Asian
 Black/African-American
 Caucasian (white)
 Hispanic
 Other (please specify) _____
3. Degree received in Occupational Safety and Health was
B.S. (Bachelor of Science) _____ year
M.S. (Master of Science) _____ year

(OVER)

4. Overall grade point average was
- | <u>B.S. degree</u> | | <u>M.S. degree</u> |
|--------------------|------------|--------------------|
| _____ | 3.5 - 4.00 | _____ |
| _____ | 3.0 - 3.49 | _____ |
| _____ | 2.5 - 2.99 | _____ |
| _____ | 2.0 - 2.49 | _____ |
| _____ | other | _____ |

For questions (5-14) if you had more than one internship position, then use your first internship experience to respond to these questions.

5. Age at completion of your internship was
 _____ years
6. Marital status at time of your first internship was
 _____ married
 _____ single (never married)
 _____ other (please specify)
7. Semester and year when internship was performed
 _____ Fall _____ year
 _____ Spring _____ year
 _____ Summer _____ year
8. Classification at the completion of your first internship was
 _____ Sophomore
 _____ Junior
 _____ Senior
 _____ Graduate
9. Type of site where internship was performed
 _____ Chemical/Petro-chemical Industry
 _____ Construction Industry
 _____ Consulting Firm
 _____ Food Industry
 _____ Government Agency
 _____ Insurance Industry
 _____ Manufacturing Industry
 _____ Mining Industry
 _____ Other (please specify) _____

10. Your primary area of responsibility (duties) during your first internship was (pick just one)
- Environmental Health and Safety
- Industrial Hygiene
- Safety Generalist
- Other (please specify) _____
11. Geographical location of primary site location was
- rural
- suburban
- urban
- other (please specify) _____
12. Approximate number of total employees at your primary internship facility was _____
13. Salary compensation for your first internship was _____ per hour
14. Within three months after graduation, did you receive a full-time job offer from your first internship organization?
- No
- Yes
- If yes, did you accept the offer?
- No
- Yes

PART II - GRADUATE INTERNSHIP PERCEPTIONS

The following questions (A-B) are about different attributes, goals, or characteristics of any general internship program.

Please answer the following questions by circling the one number in the right hand column which most accurately describes your feelings:

- Scale:
1. Very unimportant
 2. Somewhat unimportant
 3. Neither important nor unimportant
 4. Somewhat important
 5. Very important

A. How important do you feel the following attributes are to a worthwhile occupational safety and health internship program?

	<i>Level of Importance</i>				
	<u>Unimportant</u> ↔ <u>Important</u>				
	1	2	3	4	5
15. Receiving pre-employment information (brochures, videos)					
16. Obtaining compensation benefits (salary, housing, etc)					
17. Having a well-defined job description					
18. Receiving on-site orientation					
19. Interacting with management					
20. Having contact with faculty coordinator					
21. Receiving special training (computers, leadership)					

(OVER)

- | | |
|--|-----------|
| 22. Using and developing basic skills
(writing, speaking, people skills) | 1 2 3 4 5 |
| 23. Gaining confidence in technical skills | 1 2 3 4 5 |
| 24. Identifying personal strengths and weaknesses | 1 2 3 4 5 |
| 25. Exploring career interests | 1 2 3 4 5 |
| 26. Obtaining career related experience for
resume building | 1 2 3 4 5 |
| 27. Obtaining contacts for future job
possibilities | 1 2 3 4 5 |
| 28. Obtaining ability to take responsibility,
acknowledge consequences of actions | 1 2 3 4 5 |
| 29. Applying academic knowledge and
skills to real situations | 1 2 3 4 5 |
| 30. Learning skills from experience
(to observe, ask questions, synthesize) | 1 2 3 4 5 |
| 31. Working cooperatively with others | 1 2 3 4 5 |
| 32. Performing challenging work assignments | 1 2 3 4 5 |

Please answer the following questions by circling the one number in the right hand column which most accurately describes your level of satisfaction with the attributes listed as numbers 33-50.

- Scale:
1. Very dissatisfied
 2. Somewhat dissatisfied
 3. Neither satisfied nor dissatisfied
 4. Somewhat satisfied
 5. Very satisfied

B. Using the scale above, how Satisfied were you with the following attributes of your internship? (If you had more than one internship, then use your first internship to answer this question.)

- | | <i>Level of Satisfaction</i>
<i>Dissatisfied = Satisfied</i> |
|---|---|
| 33. Receiving pre-employment information (brochures, videos) | 1 2 3 4 5 |
| 34. Obtaining compensation benefits (salary, housing, etc.) | 1 2 3 4 5 |
| 35. Having a well-defined job description | 1 2 3 4 5 |
| 36. Receiving on-site orientation | 1 2 3 4 5 |
| 37. Interacting with management | 1 2 3 4 5 |
| 38. Having contact with faculty coordinator | 1 2 3 4 5 |
| 39. Receiving special training (computers, leadership) | 1 2 3 4 5 |
| 40. Using and developing basic skills
(writing, speaking, people skills) | 1 2 3 4 5 |
| 41. Gaining confidence in technical skills | 1 2 3 4 5 |
| 42. Identifying personal strengths and weaknesses | 1 2 3 4 5 |
| 43. Exploring career interests | 1 2 3 4 5 |

- | | |
|---|-----------|
| 44. Obtaining career related experience for resume building | 1 2 3 4 5 |
| 45. Obtaining contacts for future job possibilities | 1 2 3 4 5 |
| 46. Obtaining ability to take responsibility, acknowledge consequences of actions | 1 2 3 4 5 |
| 47. Applying academic knowledge and skills to real situations | 1 2 3 4 5 |
| 48. Learning skills from experience (to observe, ask questions, synthesize) | 1 2 3 4 5 |
| 49. Working cooperatively with others | 1 2 3 4 5 |
| 50. Performing challenging work assignments | 1 2 3 4 5 |

To answer questions C (51-62) please use the following options.

- Scale:
1. Strongly disagree
 2. Moderately disagree
 3. Neither agree nor disagree
 4. Moderately agree
 5. Strongly agree

C. Please circle the one answer from above that best indicates the extent to which you agree or disagree with each of the following statements regarding your perceptions of the internship experience.

- | | <i>Level of Agreement</i>
<u>Disagree = Agree</u> |
|--|--|
| 51. My internship experience clearly indicated how important basic communication (speaking & writing) skills are to success in the profession. | 1 2 3 4 5 |
| 52. Through internship work experience, I was able to identify some of my personal strengths and weaknesses. | 1 2 3 4 5 |
| 53. The internship helped me better understand myself, my interests, and my goals. | 1 2 3 4 5 |
| 54. During the internship placement, I was able to further develop my personal qualities of cooperation, courtesy, and work attitudes. | 1 2 3 4 5 |
| 55. Classes related to my area of study became more relevant after completing my internship experience. | 1 2 3 4 5 |
| 56. My internship experience was a positive educational experience. | 1 2 3 4 5 |
| 57. The job experience I received while in the internship program enabled me to gain confidence in my technical skills. | 1 2 3 4 5 |
| 58. My internship experience increased my awareness of the importance of human relations in a work environment. | 1 2 3 4 5 |
| 59. My internship experience enabled me to improve my problem-solving ability. | 1 2 3 4 5 |
| 60. My internship provided career-related experience for resume development. | 1 2 3 4 5 |

(OVER)

61. The work experience I received while on internship placement better prepared me to make a career choice after graduation. 1 2 3 4 5

62. The work experience received while on internship placement enabled me to obtain contacts for future job possibilities. 1 2 3 4 5

D. Please respond to the following questions.

63. What did you like best about your internship experience?

64. What did you like least about your internship/co-op experience?

65. What would you do differently about your internship experience if given the choice to do it over?
Before:

During:

After:

66. What three key insights would you share with an Occupational Safety and Health student who is pursuing an internship experience?

Additional Comments:

(OVER)

Thank you for participating in this study. Please DO NOT put your name, student identification, or any other identification on your questionnaire. Please place your completed survey in the enclosed self-addressed, stamped envelope, seal it, and mail it immediately.

**Charles W. McGlothlin, Jr.
120 Fisher Drive
Trinidad, CO 81082**

Appendix B: Letter of Permission



Murray

MURRAY STATE UNIVERSITY

College of Health Sciences and Human Services
Department of Occupational Safety and Health
157 Industry and Technology Center
Murray, KY 42071-3347
Phone: (270) 762-2488 Fax: (270) 762-3630
E-mail: osh@murraystate.edu

E-mail: osh@murraystate.edu

September 13, 2001

Mr. Charles W. McGlothlin, Jr.
120 Fisher Drive
Trinidad, CO 81082

Dear Mr. McGlothlin:

You have my permission to use any information that is of benefit to you in my survey instrument "Internship Survey Questionnaire, Part I and II". I am pleased to learn that you are pursuing the recommendations for further research to include a larger population of occupational safety and health interns, and to conduct similar studies at the same and different universities who have RAC/ABET accredited occupational safety and health programs.

Again, feel free to contact me if you have any questions or need additional information about the study or survey questionnaire. I wish you the best on your dissertation, and I would appreciate receiving a copy of the survey instrument that you develop.

Sincerely,

David G. Kraemer, Chair
Department of Occupational Safety and Health

DGK:lp

www.murraystate.edu

Equal education and employment opportunities M/F/D. AA employer

Appendix C: Human Subjects Approval

COPY

MEMORANDUM

TO: Duane Jansen, School of Education, 1588
FROM: Celia Walker, Administrator for the Human Research Committee *CW*
SUBJECT: **PROJECT APPROVAL**
Title: An Analysis of Perceptions of an Internship Experience of College Graduates in Occupational Safety and Health Programs.
Protocol No.: 01-311H
Funding Agency: N/A
Funding Agency Deadline: N/A
DATE: January 9, 2002

I am pleased to inform you that the above-referenced project was approved by the Human Research Committee on January 5, 2002 for the period January 5, 2002 to October 22, 2002. Because of the nature of this research, it will not be necessary to obtain a signed consent form. However, all subjects must receive a copy of the approved cover letter printed on department letterhead. The requirement of documentation of a consent form is waived under § __.117 (c) (2) with the return of the approved survey. **Approval is for approximately 600 BS and MS degree graduates of Occupational Safety and Health programs.**

A status report of this project will be required within a 12-month period from the date of approval. You will be sent a reminder approximately two months before the protocol expires. The Principal Investigator will report on the numbers of subjects who have participated this year and project-to-date, about problems encountered, and provide a verifying copy of the consent form or cover letter used. The necessary form (H-101) is available from the Regulatory Compliance web page (see below). Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

It is the responsibility of the investigator to immediately inform the Committee of any serious complications, unexpected risks, or injuries resulting from this research. It is also the investigator's responsibility to notify the Committee of any changes in experimental design, participant population, or consent procedures or documents. This can be done with a memo which completely describes the changes and their consequences (new consent form or cover letter, or altered survey instrument, for example). Students serving as Co-Principal Investigators may not alter projects without first obtaining PI approval. The PI is ultimately responsible for the conduct of the project.

This approval is issued under Colorado State University's OHRP Federal Wide Assurance 00000647 issued July 1, 2001. If approval did not accompany a proposal when it was submitted to a sponsor, it is the researcher's responsibility to provide the sponsor with the approval notice.

Please direct any questions about the Committee's action on this project to me for routing to the Committee. Additional information is available from the Regulatory Compliance web site at www.research.colostate.edu/regulatory/

Attachment

xc: Charles W. McGlothlin w/attachment

December 18, 2001

Dear Occupational Safety and Health Graduate,

The enclosed Internship Survey Questionnaire is part of a study we are conducting through the School of Education at Colorado State University. The title of the study is "An Analysis of Perceptions of an Internship Experience of College Graduates in Occupational Safety and Health Programs." The purpose of the study is to examine perceptions of the internship experience of recent graduates of ABET accredited degree programs in occupational safety and health. You are a part of this very select group of college graduates, and your input to this study is very important to help improve the internship experience of today's occupational safety and health student.

The questionnaire will take approximately 15 minutes to complete. Your participation in this study is entirely voluntary. Neither the names of respondents or organizations will be used in order to maintain confidentiality. The results of this study will be reported only in terms of group scores. This project has been reviewed and approved by the Colorado State University Human Research Committee for research involving human subjects.

There are no known or foreseeable risks associated with your participation in this study. However, it is not possible to identify all potential risks in research procedures, but we have taken reasonable safeguards to minimize any known and potential, but unknown, risks. The study will not reveal anything personal or potentially harmful about the participants. Every effort will be made to maintain complete confidentiality in the study.

Your participation in this study is voluntary and your consent to participate will be implied by your completion of the questionnaire. Questions about participants' rights may be directed to Celia S. Walker at (970) 491-1563.

Your participation in this research can help identify important characteristics of the occupational safety and health internship program that could benefit future Occupational Safety and Health program graduates, universities, and employers. You can be of great assistance by completing this questionnaire as thoroughly and truthfully as you can. Return the completed questionnaire in the self-addressed envelope and also mail separately the enclosed self-addressed post card to indicate that you have completed and returned the questionnaire. If you have any questions about this study, please feel free to call Charles McGlothlin direct at 719.846.5502 or email Charlie.McGlothlin@tsjc.ccooes.edu. Thank you in advance for your participation in this study.

Yours truly,

Charles W. McGlothlin, Jr.
Co-Principal Investigator

Duane G. Jansen
Principal Investigator

Appendix D: Mailed Survey Materials



Colorado State University

Colorado State University. The Administration Building at the end of an aisle of stately elm trees pictured in this view of the oval on the university's Fort Collins, Colorado campus.
PC 363 Photo © Jim Osterberg



Dear Murray State Graduate,
The Department of Occupational Safety and Health at Murray State University in conjunction with Charles McGlothlin, a Ph.D. Candidate at Colorado State University, is conducting research on perceptions of the internship experience of 1997 - 2001 OSH graduates of ABET accredited university programs in occupational safety and health related programs. You will be receiving a survey questionnaire packet in the mail in the next few days. Please read and answer the survey questions carefully. Your response to the survey will assist in the improvement of the OSH internship experience to better meet the needs of today's occupational safety and health-related students. Thank you for your consideration of this request.
Yours truly,

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Charles W. McGlothlin, Jr.
Colorado State University
FirstLight
Made in Colorado

SPACE BELOW RESERVED FOR U.S. POSTAL SERVICE

December 18, 2001

School of Education
Fort Collins, Colorado 80523-1588

Mr. [REDACTED]
[REDACTED]
Ephrata, PA 16201

Dear Occupational Safety and Health Graduate,

The enclosed Internship Survey Questionnaire is part of a study we are conducting through the School of Education at Colorado State University. The title of the study is "An Analysis of Perceptions of an Internship Experience of College Graduates in Occupational Safety and Health Programs". The purpose of the study is to examine perceptions of the internship experience of recent graduates of ABET accredited degree programs in occupational safety and health. You are a part of this very select group of college graduates, and your input to this study is very important to help improve the internship experience of today's occupational safety and health student.

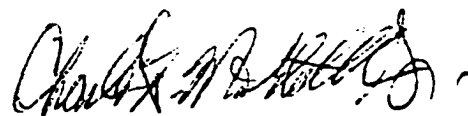
The questionnaire will take approximately 15 minutes to complete. Your participation in this study is entirely voluntary. Neither the names of respondents or organizations will be used in order to maintain confidentiality. The results of this study will be reported only in terms of group scores. This project has been reviewed and approved by the Colorado State University Human Research Committee for research involving human subjects.

There are no known or foreseeable risks associated with your participation in this study. However, it is not possible to identify all potential risks in research procedures, but we have taken reasonable safeguards to minimize any known and potential, but unknown, risks. The study will not reveal anything personal or potentially harmful about the participants. Every effort will be made to maintain complete confidentiality in the study.

Your participation in this study is voluntary and your consent to participate will be implied by your completion of the questionnaire. Questions about participants' rights may be directed to Celia S. Walker at (970) 491-1563.

Your participation in this research can help identify important characteristics of the occupational safety and health internship program that could benefit future Occupational Safety and Health program graduates, universities, and employers. You can be of great assistance by completing this questionnaire as thoroughly and truthfully as you can. Return the completed questionnaire in the self-addressed envelope and also mail separately the enclosed self-addressed post card to indicate that you have completed and returned the questionnaire. If you have any questions about this study, please feel free to call Charles McGlothlin direct at 719.846.5502 or by email at Charles.McGlothlin@ColoState.EDU. Thank you in advance for your participation in this study.

Yours truly,



Charles W. McGlothlin, Jr.
Co-Principal Investigator



Duane G. Jansen
Principal Investigator

**Colorado
State
University**

Knowledge to Go Places

School of Education
Fort Collins, Colorado 80523-1588

Charles W. McGlothlin, Jr.
120 Fisher Drive
Trinidad, CO 81082





Charles W. McGlothlin, Jr.
120 Fisher Drive
Trinidad, CO 81082

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Response Verification Card

Note to Graduates:


Please complete and mail this business reply card separately from your questionnaire.

I returned the Internship Survey Questionnaire to Charles W. McGlothlin, Jr., 120 Fisher Drive, Trinidad, CO 81082 on _____ .
(Date)

Name _____
(Please print or type)



[REDACTED]
[REDACTED]
Sidney, NY 13838-1395

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Follow-up Postcard

Dear Millersville Graduate,

Approximately two weeks ago, you should have received a survey questionnaire from me on perceptions of the internship experience of occupational safety and health graduates of ABET accredited university programs in occupational safety and health. If you have completed the survey and mailed it, I appreciate your effort and please disregard this notice. If you have not yet done so, please complete the survey and mail it as soon as possible. If you did not receive a copy of the survey and still would be willing to participate, please call me at 888.736.2883. Your participation in this research study is important to the research validity and can have a positive impact on improvements in the OSH internship experience. Thank you for your time and help in this endeavor.

Yours truly,



Charles W. McGlothlin, Jr.
Colorado State University

Appendix E: Qualitative Analysis, First Level Code

Value of Internship, Positive, Personal - V(+), Pe.

1. allowed me to receive several training courses at no cost
2. Real life experiences that helped me grow personally
3. able to work independently, yet I had the support if I needed it
4. I got to practice my public speaking skills during many presentations.
5. This was a great experience since I have always had a problem speaking in front of a group.
6. variety that I received from working in two different plants on the same campus
7. four different sites to go to during the semester gave some variety
8. freedom to come up with ideas and act on them
9. I was able to sharpen my abilities
10. I would suppose I had a shot of reality and it led to me knowing that I was more capable than I even thought and with time and experience I kept getting better
11. Name recognition on my resume was another huge benefit
12. Utilizing previous work and flying experience I enhanced both personal and professional skills
13. to make myself more marketable
14. Low stress
15. Initially finding myself in an all-male, rural industrial facility where no one would speak to me, and having them throw a party for me when I left. I had won them over
16. Developing communication skills
17. Safety should be tops on management and unions list, but it isn't. Union and safety don't work. The union is concerned that safety/ergonomics changes will eliminate jobs
18. the best thing I've ever done for myself
19. an immense advantage over other students
20. one of the most valuable experiences in college
21. by far the most valuable college experience I had
22. It made me more disciplined.
23. Try to get involved and not be passive.

Value of Internship, Negative, Personal V(-), Pe.

1. I thought I was going to be overwhelmed
2. I was not satisfied with my job performance
3. Not prepared for union issues and considerations
4. I felt neglected/unimportant
5. The hot environment that I sometimes worked in
6. Expected to work 24/7, overnight/out-of-town projects without advanced notice
7. More Technical writing and research [needed]

Value of Internship, Professional, Positive - V(+), Pr.

1. Obtaining experience
2. Real life experiences that helped me grow professionally
3. Utilizing previous work and flying experience I enhanced both personal and professional skills
4. applying what I had been taught allowed me to visualize what I had seen in industry and correlate it to my classes
5. first handed look at problem solving at every level
6. ability to work in the field I had studied for four years prior
7. Multi-faceted safety and hygiene issues
8. [work] that related both to my undergrad and graduate degree
9. learned more in one year of internships than I did in 3 1/2 years of classtime
10. I loved learning about the automation from the foremen
11. to identify unsafe actions and conditions is a skill best learned in the workplace
12. significant amount of opportunities to identify and correct hazards in the work environment
13. Exposure to areas of safety that were not discussed in the classroom setting
14. Able to make suggestions that will drastically reduce accidents and injuries
15. Knowledge gained of general manufacturing machines, unions and their workers, and the "language of business"
16. I was able to perform a variety of activities in the safety and industries hygiene and work in a manufacturing atmosphere
17. the chance to make decent wages
18. Profession interaction in large corporation setting
19. It gave me a good feel for the OSH field and what work responsibilities and requirements I would have
20. I was able to see how WC can impact decisions of many companies (large and small)
21. seeing what "the real world" of safety entailed opposed to reading books and listening to lectures
22. I was dealing with a union environment and I did not have a clue how they worked until I was tossed in the plant
23. Union tensions with management. Management saw safety as a nuisance to production, management was ineffective. But this was valuable real-life experience.
24. I do not think schools prepare you for the "reality" of business
25. better for professional growth than any class
26. gives you an idea of how the real-world works
27. help[ed] me get my first job
28. Management theory is useless to the extent that which it is taught. Organizations are combined of a lot of theories.

Value of Internship, Negative – V(-), Pr

1. performing tasks not required by the school to keep the company happy
2. Most assignments that I completed were not relevant to my current work activities
3. Not long enough to set a real feel in the responsibilities involved

4. **Couldn't make the changes that needed to be made only a band aid**
5. **The facility announced that it was closing 1/2 way through my internship**
6. **Small manufacturing facility with out a qualified safety professional. Staff positions, such as HR, given safety responsibilities in addition to their everyday responsibilities**
7. **The UAW went on strike at another facility. Our plant closed down due to lack of parts. I did not get to complete these projects**
8. **[Disappointed] that it did not turn into a full-time position**

Value or Internship, Positive, Career - V(+), Ca.

1. helped me become more prepared for the job market
2. use that experience as a resume builder
3. Manufacturing experiences of business
4. Working in a "real world" job atmosphere as a safety professional helped me to decide what direction to take when I graduated
5. Relatively unaware of safety professional job duties
6. I knew what to expect when I graduated
7. The opportunity to see what is really out there
8. the classes I took did not prepare me for what is expected of a safety professional
9. Exposure to work environment in H&S field
10. The networking I was able to do with many different people
11. consultants was a big advantage
12. hired part-time after completion (treated professionally)
13. It gave me the opportunity to discover that safety is not one field that I should be employed in, before I began working
14. opportunity to learn about industry before entering the job market
15. The real world of safety in a company is totally different from what is taught in school
16. I learned fast what it would take to get my job done and realized that not all companies are out there to take care of their employees
17. I was exposed to different industrial settings on a daily basis
18. It opened many doors after graduation
19. I had the opportunity to experience nearly all aspects of Safety and Health at one location
20. different safety exposures/hazards
21. developing business contacts
22. Making excellent contacts, for example; those outside the safety and health field such as H.R. manager, plant manager, etc.
23. Got a job from it
24. Interning at a consulting company gave me the ability to experience indoor air quality, industrial hygiene, and safety issues
25. networking to accomplish goals
26. [Interaction with] actual blue-collar workers, [learned to] relate to them on their level and came across as an equal unlike my supervisor
27. How I can apply safety to another career. My degree has given me the opportunity to apply safety to insurance (brokerage), while learning the entire spectrum of risk
28. It gave me clear understanding of what I did not want in a full time position upon graduation
29. Learned more about mining industry and the type of industry I wanted to work
30. I learned that safety is not as well received by employees as it should be
31. I feel it made the difference in my career.
32. understanding of your chosen field
33. Working as an intern definitely provides insight into a career position and allows the student to decide if they are making the right career choices.
34. to know what you are going to experience
35. politics, budgeting and the worker/management relationship were items that are too difficult to teach with books

36. my internship experience was extremely valuable in determining my initial career path following graduation
37. This gave me a lot of real world experience.
38. helped me to get a job extremely easily

Value of Internship, Negative – V(-),Ca

1. Being in the medical field as an intern and then getting a job in an industrial setting
2. [Needed] more time to see what a supervisor did day to day, especially interactions with management
3. disliked the day-to-day operations with the union. Nothing terrible ever happened it just seemed to make everything more difficult on the management side of things

Important Characteristic, Satisfaction - I(+), S(+)

1. Interaction with various levels of management.
2. using the knowledge that was gained through coursework
3. friendships with other interns
4. earned good money
5. resulted in great job offer
6. brought out the class studies in a real life scenario
7. work with a wide variety of individuals and all levels of management
8. applying what I had learned in my college courses
9. interaction with management
10. chance to work with a wide range of other safety professionals and engineers
11. was able to write and implicate program
12. start training, monthly safety meetings, etc.
13. variety of items that I completed
14. interacting with the foremen
15. high level of responsibility
16. applying classroom knowledge to real life situations
17. hands on experience
18. exposed me to real life scenarios
19. apply my education to real work situations
20. Learning from degreed and certified professionals
21. hands-on experience I was able to obtain out in the field
22. beneficial to bring my experiences back to the classroom
23. Ability to create presentations
24. ability to do many different jobs, such as environmental sampling, noise prevention, etc.
25. worked with a person that handled the safety, industrial hygiene
26. experience of working in my field of study
27. practicing/performing my job duties
28. money was great
29. liked getting to observe professionals working in my field of study
30. opportunity to perform several large projects under general supervision
31. learned about the need to document findings for future reference
32. increased my ability to audit a facility for EH&S compliance
33. It was paid
34. Having the responsibility to solely complete an ergonomic project
35. Ability to have freedom to conduct safety and health maintenance as I saw necessary
36. hands on experience
37. Getting the hands on experience
38. interaction with employees and management was great
39. Freedom to perform my job without constant supervision
40. Hands on experience with how to calibrate monitors, pumps, etc.
41. Relevant work
42. Had a list of projects that had to be completed
43. Working with a diversified group of people to accomplish a project on time and budget
44. Broad base of experience gained

45. ability to work on my own on an assigned project
46. Getting hands on experience
47. Employee interaction
48. management interaction
49. hands on experience with career related duties (i.e. IH monitoring, injury reports, EPA permits, training, emergency response, etc)
50. Ability to interact with safety professionals at various career stages and backgrounds
51. Applying classroom skills and knowledge to "real world" situations
52. Getting paid for the work I was completing
53. the best part was the application of classroom concepts to a practical setting
54. I was given work assignments and left alone to apply my classroom knowledge
55. my supervisor was typically available for me to ask questions
56. I knew what needed done the following day
57. Wide range of responsibilities working for a municipality, utility safety down to recreation management
58. Applying academic knowledge to real situations
59. Working independently
60. Responsibility and challenges
61. having the ability to apply classroom to hands-on
62. went out to different industries and conducted inspections and investigations
63. Experience in various E, H, and S subject areas
64. To meet different people and apply what I had learned
65. Hands-on application of my studies
66. Applying classroom skills
67. Real-life situation
68. Being able to experience many different areas/issues relevant to the safety field
69. Experiencing a different kind of work environment than what I was used to
70. Management's (both project and corporate) willingness to support me in safety efforts
71. The sites that had their "act" together
72. I learned more about the "real world"
73. I was placed in charge of developing and facilitating safety trainers
74. Responsibility
75. Better knowledge of business world
76. great opportunity to interact with different levels of management
77. broad range of manufacturing safety experiences
78. I taught classes, in the training center
79. Hands on and experience new work environment
80. Applying academic knowledge to real life situations
81. Working towards V.P.P. certification for the company
82. Variety of IH duties
83. travel to various job sites
84. excellent compensation
85. It was a real life experience outside of classroom studies
86. allowed me to take on certain responsibilities, which had real life meaning and consequences
87. Hands on experience-A must!
88. Research

89. helping facility overcome problems and develop foundational remedies
90. The hands on experience dealing with employees
91. The opportunity to apply classroom knowledge to workplace situations
92. best part was the ability to interact with a wide variety of people
93. Delegated responsibility for specific projects from start to completion
94. Gaining real world experience
95. The ability to learn new discipline (i.e. Risk Management)
96. Travel opportunities people interaction
97. Learning real world safety
98. Experience and applying academic knowledge to real situations rather than hypotheticals
99. People I was able to interact with
100. showed me that although I learned a great deal from my college experience, not everything I was told necessarily is true
101. Interacting between the employees and myself
102. opportunity to relate with local as well as corporate and international management
103. opportunity to learn practical skills
104. Applying learned skills
105. learning/developing new skill as well as increasing knowledge-base
106. It showed how book knowledge applies to the "real world"
107. Independence: work and personal
108. On the job experience that you can not get in the classroom
109. Real-world application of classroom theory
110. The chance to actually perform a safety related job
111. I got to experience "real world" business challenges
112. realize you don't have all the resources, which may be available in a classroom
113. Constant challenge, helping small businesses use safety and health to save money
114. opportunity to work in an area I was interested in
115. person I interned for
116. Training opportunities
117. opportunity to work with others
118. Built resume
119. Gained experience in heavy industry
120. see safety/health at different companies for an overall look
121. five reports due at the end of each site visit
122. Very detailed writing needed; this is a strength over other safety professionals!
123. Learning about what occupational safety really is
124. Traveling, it was nice to see the different attitudes toward safety in different areas of the U.S.
125. The opportunity to gain real-world experience while utilizing classroom knowledge
126. Application of skills/educational experience
127. Wide variety of experience
128. the chance to make decent wages
129. I liked getting out I the real world even though I did not get paid
130. it helped me learn that I could really do the job in the real world
131. The best part of my internship was getting real life experience in safety
132. It helped me better understand what was being discussed in class

133. helped me focus my career objective
134. Being able to determined strengths/weakness while still in college
135. Being able to apply classroom to industry
136. The people [interaction]
137. Real world experience
138. Opportunity for work in a variety in organizations
139. Real world application of theory
140. [received] Stipend
141. The opportunity to apply classroom knowledge to real life application
142. The hands on experience
143. The ability to bring the class material to life and see it all come together.
144. Got to see four different types of industry/workplace
145. The opportunity to get experience
146. Real world experience. Resume builder
147. I liked the strong relationship between safety professionals and upper management
148. Being able to apply what I learned in the classroom
149. Able to use hands-on technical skills learned in classes
150. Developed communication skills
151. Learning different management techniques/styles
152. Gain "real world" experience
153. The freedom I was given to learn the job along with the responsibility given to me
154. Variety of sites. Four internship locations
155. The atmosphere in the facility I worked
156. The real life perspective and how the corporation interprets the standard and implements
it
157. Real world experience
158. To live and breathe environmental, health and safety
159. Getting to know individuals and gain some insight of their past work experience.
160. Real world environment of the application of safety sciences
161. Getting experience before my first professional safety job
162. I learned a new part of the job each day
163. liked the responsibility level that was placed on me
164. rounding out the degree pulling all classes together
165. Exposure to a variety of safety related career opportunities
166. Meeting with fellow students in regards to internship
167. I was able to lead my own experience
168. Using what was learned in the classroom in real life situations
169. Hands on experiences
170. Hands on experience
171. Working with various age groups
172. Applying knowledge from classroom to practical experiences
173. Meeting other safety professionals
174. Real world experience to apply what I learned in school
175. Experiencing the manufacturing atmosphere
176. meeting new people
177. variety of challenging tasks

- 178. learning from someone who has been in the field for some time
- 179. ability to interact with management
- 180. The knowledge I gained
- 181. It was very challenging
- 182. I learned a lot and achieved several things during my internship
- 183. a beneficial way to make future career connections
- 184. Internships also teach you your strengths and weaknesses which will help you out in future classes
- 185. excellent learning experience for a future career
- 186. great way to grow as an individual
- 187. My internship on my resume did help me get my job right out of college
- 188. double check your work, spelling, etc. before turning [in] a project
- 189. I was able to apply skills and knowledge.
- 190. the best experience of my college career
- 191. most beneficial part of my entire graduate level education
- 192. valuable technical and hands-on experience

Important Characteristic, Dissatisfaction, I(+), S(-)

- 1. My site coordinator assigned nearly all of the facility coordinator's suggested activities
- 2. My site coordinator was on a consulting job and was able to provide little to no guidance
- 3. I was basically thrown out to sink or swim
- 4. Unrelated busy work
- 5. Not being able to perform or gain experience with multiple tasks
- 6. Not enough time or experience
- 7. Lack of business experiences outside of EHS
- 8. My roommate we did not get along so well
- 9. some of the jobs were basic
- 10. Interns seem to get stuck with MSDS organization and other simple jobs
- 11. more challenging job tasks should be planned for interns
- 12. My primary focus during my internship was ergonomics
- 13. I would have liked to be involved in more safety and IH applications
- 14. The lack of direction received from one [of] the two plants
- 15. [lack of] responsibility
- 16. Not getting paid
- 17. becoming the "secretary" when things at the office were going slowly
- 18. Writing reports having no purpose
- 19. It was not nearly challenging enough
- 20. I did a lot of "secretary" work instead of what my education was for
- 21. The pay
- 22. I was not challenged enough, nor had assignments that I felt I was able to benefit from
- 23. I wish I would have done or conducted some air sampling
- 24. A schedule/job duties had not been set up for me
- 25. I had to initiate most of the projects I did myself
- 26. Working in a union shop is extremely difficult
- 27. Busy work, Human Resource activities

28. The lack of initial training for the ergonomics software I was required to use
29. Not having a voice in selecting the participating companies
30. I would go in, they showed me around and the rest was up to me to figure out. They didn't know what to do with an intern
31. Not getting paid
32. Did not get to have a say in decision making processes
33. I feel like I have to ask before doing anything
34. Lack of compensation
35. Having a short time to learn the organization, its expectations, and the projects that I would work on during the summer
36. I thought the education that I received in school did not apply to the real world
37. We are taught so often in school the ideal situation, when most of the time it was not. What would benefit this problem is to have professors with working experience in the field (OHS)
38. Dissatisfied with] pay
39. No challenging jobs
40. Too much irrelevant paperwork
41. Did not receive special training
42. I could make suggestions, but they were usually cast a side
43. Management only perceived me as a student (expect the EH&S manager) who was there to complete busy-work
44. The company I was interning for gave me no back up, no support and no information. I was told that these were seven job sites in my city and to drive until I saw one of their signs
45. [No] payment
46. Repetitive work
47. Gathering MSDS information
48. No pay, a lot of work
49. Being treated like a co-op/intern [undesirable]
50. Lack of "hands-on" experience
51. it is still difficult to really prove yourself in a 10 week period
52. No interaction with top management
53. Pay could have been better for suburban Chicago
54. Pay [poor]
55. Sometimes, I wished I got more positive feedback
56. The pay rate was lower than expected
57. Didn't get paid
58. I also didn't like the fact that I wasn't being paid, but I felt the experience that I was getting was worth the sacrifice
59. Not making employment contacts and skill experience
60. No being paid and having to travel
61. Didn't feel prepared enough
62. Not given enough responsibility in terms of working on special projects
63. No pay
64. Lack of exposure
65. It was an unpaid internship
66. Lack of monetary compensation
67. Small pay

- 68. No pay/compensation
- 69. No reimbursement for travel
- 70. Need to do a six-month to one year intern.
- 71. Being this was my first internship, I was unsure of business ethics, and generally how to conduct myself.
- 72. I would have liked to have more information prior to my first day.
- 73. It would have been beneficial to complete paperwork and have some pre-start date materials.
- 74. I would have liked to know more about the construction industry.
- 75. More preparation in senior level classes for internship experience.
- 76. classes in similar evaluation/report writing scenarios.
- 77. faculty places unreasonable demands upon a student who is working
- 78. This internship set me back and took away what I learned a[t] WVU.

Location of Internship, Positive – Loca(+)

1. Working close to my home
2. liked the location of the plant

Location of Internship, Negative – Loca(-)

1. Having to drive about two-hours a week to get to a site
2. I had to move ten hours from home and housing was terrible
3. Living away from wife and kids, two household expenses
4. Distance [to intern site]
5. I had a long drive to work
6. I was a non-traditional student with a full time job and it became difficult to travel to the sites
7. The drive to the site
8. The distance from my home
9. Location of internship [undesirable]
10. The distance I had to travel and the internship being non-paid
11. Long commute
12. Location. Very few people my age around area
13. I had to travel 40 minutes to the job site
14. Having to find temporary housing
15. Long commute to Philly
16. Location [poor]
17. Having to move

Site Industry, Positive – Site(+)

1. [liked] product that was manufactured
2. manufacturing environment was extremely interesting
3. type of manufacturing facility (foundry)
4. working in industry and construction
5. largest construction projects in the world
6. I worked at a large automotive assembly plant
7. I was fortunate to work with one of the top 3 airlines in the world
8. The facility I worked at was a fully integrated pulp and Paper mill
9. got to see different manufacturing processes

Site Industry, Negative (Site -)

1. Industry type [undesirable]

Reflection of Internship, Positive – Reflect(+)

1. logistics of putting together the final product was fascinating
2. To review notes of lessons learned on a regular basis.
3. Absorb what I learned.
4. a presentation should be conducted at the internship facility over one of the assignments

Reflection of Internship, Negative – Reflec(-)

1. The internship reports, that I was assigned, were not applicable to undergraduate internship work
2. They were more of a hindrance to my learning than a help
3. To[o] much emphasis was put on format of the report versus content

Intern Duties, Positive, Du (+)

1. HR and Safety are linked in the same departments in most manufacturing settings
2. Internship with a large corporation first and time permitting intern with smaller company

Intern Duties, Negative, Du(-)

1. I was working full-time in the HR field
2. I was not able to apply my technical skills
3. Little exposure to the day-to-day issues that an EH&S professional must handle
4. Did a majority of paperwork responsibilities, which did not allow me to interact with my job setting
5. Too many projects. The assignments must be well thought out and organized to focus the student's efforts while at the same time giving he/she exposure to a diverse variety of safety and health situations
6. Did not base assignments on types frequently and severity of injuries
7. was given a lot of secretarial work to do, and did not get the opportunity to concentrate on areas of interest
8. Too much time was spent on projects and too little time was spent shadowing the safety professional that would have provided a wide variety of experience
9. Project became boring after several months
10. Repetitive/tedious office work
11. Tasks were not the most challenging
12. I believe that I cared have taken on more responsibility than I was given
13. I did the same task every day
14. Not being able or given the chance to make a difference
15. I was given too many analyses to perform in too short of time
16. Undefined work expectations
17. Lack of communication from management about job duties
18. My job function was not well defined. I pretty much provided all of the "grunt" work for all aspects of the organization. I would have rather focused on a couple specialty areas of interest
19. Wasn't able to do a lot of things by myself. Didn't feel as if I was an independent
20. Not being able to see written programs implemented
21. My base/mentor did not care to help an intern learn more about the field of safety and health, rather, they used and intern as a temporary employee to complete less then challenging tasks
22. I wish it covered more health and safety topics
23. Job description/duties need improvement
24. I didn't get enough hands-on "plant" experience
25. Not given diverse assignments
26. Not learning all facts of EHS management
27. Needed more defined tasks.
28. I was misled. I was not permitted to do inspections or audits of any type with my supervisors-as I was told "I cannot see how that would benefit Webert, you would only be holding the process up."

29. I was their glorified secretary and felt that I was sexually discriminated against. It was the worst experience I have had
30. I did not have a set job description and toward the end of the placement I was bored and frustrated with the management I reported to
31. The internship was not 100% safety focused

Site Supervisor, Positive - Super(+)

1. I was not micro managed by my direct reports or faculty advisor
2. I worked for the corporate safety director who was (and is) a world class mentor
3. The people that I worked with were also very encouraging

Site Supervisor, Negative – Super(-)

1. My superior did not allow me to see everything that she did in her position
2. she gave me the things that she did not want to do
3. If I could have at least had a little bit of exposure to every aspect of her position
4. [need] a more well rounded internship experience
5. My supervisor, the plant safety engineer, treated me like his personal secretary
6. He was a poor mentor and leader and was rarely even at work that summer
7. Unintelligent safety professionals in the field
8. The department was fairly un-organized had just hired a new safety director right out of college
9. the limited direction I received from my direct supervisor
10. the information was not concise enough for me to do the best possible job
11. My supervisor had poor people skills
12. I only saw my "boss" three times in eight months and he was of no help to me
13. Knowledge of personnel (contact person) on-site inadequate
14. I didn't get along well with my supervisor. He was extremely hard to talk to so I usually worked around him and avoided contact
15. Not enough leadership and guidance from supervisor
16. The guidance at one of the internships from the company contact was not beneficial
17. No mentor at facility
18. Supervisor was not a safety professional
19. I did not have a safety mentor

Internship Structure, Positive - Stru(+)

1. The well structured/defined projects!
2. I had to do four reports each was graded and returned before the next was do, giving me an opportunity to improve

Internship Structure, Negative, Stru(-)

1. internship started slow with only one project
2. Internship was not well structured
3. I was dedicated to one project and not exposed to all I felt I should have been
4. It is the responsibility of the company accepting an intern as an employee to make sure this happens [good structure/learning exp.]
5. Company was very disorganized and didn't really have much work for me to do
6. Was put into a couple of situations that an intern should not have been placed
7. Not much guidance but I'm a resourceful person who could find opportunities
8. it was difficult to set up my own internship
9. Was laid-off after 18 months due to downsizing of the company
10. Working for a large company, your human resource representative does not have the time to thoroughly answer questions about the company and your benefits
11. The way the organization was organized from the top to the bottom of the organizational tree
12. The safety department was very small and not well organized. No structured agenda for daily duties
13. The unclear objective of the safety office
14. The sites that were just covering themselves
15. Lack of structure in program
16. EHS secretary who thought herself as queen bee of the safety hive, leading to a few heated disagreements
17. I felt that my role and level of authority was not well defined
18. Too long-12 weeks
19. Too short-only three months
20. School assignments were a waste of my time and the time of my direct report. Allow the intern coordinator to assign tasks on a daily basis
21. Focus on written reports and assignments and not focus on internship locations loss experience
22. I felt like the "red tape", and the "not stepping on anyone's toes" aspect held me back from achieving my goals
23. No training, direction, and it was very unorganized, no one really knew what exactly they were supposed to be doing
24. Hours [long]
25. The book we had to write on each visit-get real-the real world is not like that. Nobody ready reports 100-150 pages long
26. This was my intern location's first internship offering, so they were somewhat "green" as to what to expect
27. Lack of challenges worthy of skilled professionals

28. Essentially as an intern I felt the company did not organize their internship programs effectively in order to maximize an individual potential experience
29. Not enough time to finish what I started
30. Not enough time to develop
31. It was not long enough
32. The switch from daylight to nightshift work every couple days [undesirable]
33. I did not have the time to complete my assignments to the best of my ability
34. I didn't like the office environment where I worked-everybody smoked, cussed, etc.
35. Poorly organized
36. Failure of management to utilize my skills and background for both the company's and my benefit
37. Some interaction with employees [not enough]
38. Overall experience gained-totally lacking professionally
39. Performing for professors and not on-site supervisor
40. Very little pre-planning/review of assignments
41. The short length of time
42. Too much computer work and not enough out in the plant experience
43. I did not have as much "hands-on" experience as most interns receive only because I had to wait until a consultant was going to the specific location
44. The internship did not help my resume
45. Not being out on the floor more. I was not able to have a lot of contact with the workers on the floor
46. Worked a lot with only one department as general laborer. Not a lot of S&H experience

Internship Preparation, Positive – Prep(+)

- 1. Go to work in an industry (manufacturing, risk management, chemicals, etc.) that is most interesting to you.**
- 2. Don't give up on the interviewing. Be persistent.**
- 3. It's easy to find an internship**

Internship Preparation, negative – Prep(-)

- 1. The first couple of weeks of being unsure and unprepared**
- 2. there should be a small list of things that the student has to participate in**
- 3. busy managers had to deal with other than what was planned for the intern**
- 4. this company has no intention of hiring students straight out of school-I wish I had known this**
- 5. I've had two internships. Both supervisors at each internship did not have safety background.**
- 6. I did not receive much help in finding an internship**

Coordinator of Internship, Positive – Coord(+)

Coordinator of Internship, Negative – Coord(-)

- 1: The guidance and grading by the coordinator of the internship program left something to be desired. This individual should serve as a mentor and a resource, our coordinator was neither**
- 2. The inability of my internship advisor to return or even grade any of my material, or return my calls**
- 3. I do not feel that the importance of an internship/co-op was stressed strongly enough by all faculty/staff members**

Personal Responsibility – Before

1. I would have expanded my interview process and not put all my interview process and not put all my eggs in a few baskets. It was fortunate; I was able to obtain the place I wanted to go.
2. Work harder to market myself to a company in which I would like to be employed by the future.
3. Find out more information about the company and find out what exactly I would be doing. I would have also done my internship somewhere else.
4. Start sooner in my college career.
5. Do more in depth research on the company committed. Negotiate benefits, salary, and living arrangements.
6. Research the company more thoroughly and look over OSHA laws for the area I was working in.
7. I would have researched the product lines and the history of the company. Also, I would research the particular location that I was assigned to, in order to have a grasp of what operations the facility performed.
8. Looked into more opportunities before selecting a site.
9. Try to find an instruction on union structures, work issues, ect. Pack and take my class notes and manuals.
10. Understand exactly what my internship would consist of. I thought I would be getting more IH experience during this internship and I hardly got any.
11. Get more organized. It is a lot of work and you can gather a lot of information that you need to keep straight.
12. I would have spent more time with my advising professor getting clarification on my report assignments.
13. Prepare better for the experience. Research the company, product lines, and chemicals for IH, and ask about current SS & H issues we would be working on.
14. Take more computer classes.
15. Ask more questions during the interview process at expectations/responsibilities.
16. Enhance Public Speaking Skills.
17. I would have liked to be able to have gotten a better understanding of the facility and the jobs being performed.
18. Researched the area I was moving to and develop a rapport with the person I was to be working under.
19. Have a clear understanding of how each management position interacts with each other.
20. Research the company and my roles and responsibilities before accepting the position.
21. During my intern interview I would have found out more about my job descriptions, housing, and the status of the safety department.
22. Present a list of my expectation.
23. I would have taken an ergonomics class and studied more about the subject.
24. more active in our school department. To learn how to obtain the “good” internships. To find an internship that would lead to a full-time job after graduation and provide the most educational experiences.

25. Made sure advisors knew more about the participating company, would have taken more human resource classes, management classes, and communicating classes, and researched all types of jobs.
26. Been more aggressive at pursuing an intern.
27. Prepare better for human resource situations.
28. Looked around for an internship that offered general industry experience.
29. Request a job description with clearly required objectives.
30. Study.
31. I would work with my faculty coordinator more in effort to tailor my assignments more towards the company's direction.
32. Focus more on my classes and improve more on presentation skills.
33. choose an internship more suitable for my interests.
34. Inquire of special training needed during the interview process.
35. Talk to people who worked for the company or other people who had interned for them.
36. Ask more questions on job descriptions.
37. Understand how the organization is structured.
38. Focus more on writing skills.
39. Visit the location and ask about the specific goals of the safety office.
40. Be better prepared by doing research in the company and manufacturing process.
41. Speak up for myself more.
42. Better research of internship opportunities to get one that could best develop my skills.
43. Interviewed more with different companies.
44. Spend more time researching companies.
45. Choose one closer to home.
46. Determine what my responsibilities would be and how I could become a more integral part of the safety program at that company.
47. Discuss in more detail responsibilities.
48. Gather more information about the company and my job duties.
49. Find own internship with company matching my professional interests.
50. Ask more questions and get more feedback from others who had interned there.
51. Ask for more money.
52. Learn more about the company/industry.
53. Gain more knowledge about the mining field.
54. I would have started earlier looking for internships to be able to evaluate several opportunities.
55. Find a more acceptable housing situation.
56. Review material that was taught early in my college career.
57. Locate my own housing rather than allow the company to find housing for me.
58. Have the company clearly define its goal for your experience and existence.
59. Obtain [internship]closer to home.
60. Interview/Research more companies to determine job goals specific to means of interest.
61. Researched different industries to identify industries that pay higher salaries.
62. identified an area of interest for the problem report sooner.

63. Started earlier.
64. Contacted the agency sooner so I would have had chance to get a paid internship
65. Find a different company that would develop skills for job availability
66. Better prepared.
67. Have exact job description/plan in writing and communicated clearly so that I knew what was expected upon arrival.
68. Establish salary.
69. Look into alternate internship.
70. Improve on my presentation skills.
71. Ask for a clear job description.
72. Prepare.
73. Talked more with others.
74. Better prepared.
75. More pre-planning.
76. Gain more information.
77. Studied the regulations more.
78. Do more research about the company.
79. Interview with various companies.
80. Interview the company.
81. Taken a class on labor relations.
82. Find an internship with an open minded company towards safety.
83. Get more information about the company I was interviewing with.
84. Not procrastinate.
85. Taken more time to research my duties.
86. Look at several different companies.
87. Research the company.
88. Study more.
89. Ensure a competent safety professional [as site coordinator].

Personal Responsibility – During

1. Taken a more proactive with plant management to involve department managers more with project processes, sampling, training development.
2. Pushed harder to drive myself into more responsibility within the organization.
3. Make more contacts; take advantage of more special training events.
4. Be more of a self-starter.
5. Take the initiative to get involved in other aspects of business outside of EHS; such as a leadership role, finance, etc.
6. Made copies of the work that I had completed during my internship.
7. I would have followed my superior around to have a more well-rounded internship experience. I would have gotten out from behind the desk and been on the production floor more.
8. After: I would have maintained better contact with the people that I worked with at my internship.
9. Worked harder to accomplish my objectives. Worked more on my communication skills.
10. More recreational/social interaction.
11. I would have asked to have been involved in more safety and IH applications instead of only having one main focus.
12. Ask more questions and work harder to be more self-motivated.
13. Not take any other classes.
14. I wouldn't have wasted as much time trying to figure out how to do my report assignments. I would have asked more questions of my advisor.
15. Push supervisor to set established responsibilities and goals for both of us.
16. I would have tried to work more with upper level management to show them my potential.
17. Take on more responsibility and challenging projects.
18. Work more closely with management.
19. Seek or look for more issues to work on.
20. Ask to be involved in various activities and programs.
21. Gain better practical experience with certain OSHA regulations.
22. I would have gone to the department head and told him that I needed more guidance of what my job description was and what I needed to be doing. Some days I felt like I got paid for nothing.
23. I would be more assertive.
24. Taken on more responsibilities.
25. Constantly being involved in all areas.
26. Spent additional time shadowing production managers.
27. I should have asked more questions and had more exposure to workers compensation.
28. Better communication with management, possibly do a six-month internship.
29. Speak more with employees and management, and ask as many questions as possible.
30. Asked them to describe what my job was so I would be able to focus on a task and complete it.
31. Would've interacted more with employees.
32. Be more outspoken and assertive in my projects and to my supervisors.

33. Better acquainted myself with the corporate infrastructure and network.
34. Study.
35. I would work with my faculty coordinator more in effort to tailor my assignments more towards the company's direction.
36. I would probably spend more time with the operations and maintenance employees to gain their perspective. Even if it meant staying over to a night shift or two.
37. work with the faculty coordinator more, and ask my faculty contact for more assistance and guidance with assignments.
38. Be more assertive.
39. Free up a day's time to follow supervisor going to management meetings and problem solving.
40. Ask for more complex jobs/assignments.
41. Interact more with upper management and work closely with managers in related areas, not just my specialty.
42. Work harder to get the most out of it and increase employee interaction.
43. Ask more questions.
44. Ask more questions.
45. Put more time and effort into the assignments.
46. I would have worked more closely with other safety professionals on the job and performed well in training.
47. Get more involved in the company in general.
48. Get involved and introduced with plant floor supervisors.
49. Always come to presentations with overheads, if you are presenting.
50. I would have interacted with the employees a little more.
51. Ask more questions.
52. Assert myself more than I did.
53. Ask for my projects to get more experience.
54. Communicate with my supervisors my dissatisfactions with my daily tasks.
55. Asked to experience more of the things that I need and wanted professionally.
56. Try to better understand the objects goals of my job duties.
57. Spoken up a little more to express my opinion about the situation of being unorganized.
58. Push for more difficult assignments.
59. Communicated more efficiently with my supervisor.
60. Show more initiative.
61. Better defined management roles.
62. Make sure that my supervisor and I knew exactly what was expected of me.
63. Initiated interaction with top management.
64. Put more effort into the reports that were required writing.
65. Try to interact with more people while I was there.
66. Spent more time networking.
67. Provide performance assessments in order to define if you are meeting their goals.
68. Ask more questions.
69. Spend more time learning each function.
70. Obtain more hands on experience.
71. Obtain additional training/certification, if available.

72. Work more hours.
73. I would take a lot more notes throughout the internship and start to write my papers as soon as I completed the task.
74. I would also talk to my professors more to get a better understanding of their requirements.
75. Possibly been more flexible and willing to accept assignments that weren't necessarily in my field of experience or interest.
76. Have supervisor set goals for my position.
77. I would have spent more time out "in the field" than in the office.
78. Interact with the managers more directly instead of just observing them.
79. Insist to be more involved.
80. Ask more questions.
81. Apply myself more.
82. Got more involved.
83. Become more involved.
84. Talked with drivers of trucks more often.
85. Better time management.
86. Put more hours in learning the plant better.
87. Get out in the plant more.
88. More interaction with management.
89. Visit more sites.
90. Become more involved with safety committees.
91. I would have taken it seriously.
92. Pay closer attention.
93. Push my learning more.
94. Get more involved in issues that were going on.
95. Be more creative.
96. More interaction.
97. Take notes.
98. Cross train with other departments.

Personal Responsibility – After

1. I never received my internship grade or major GPA. Possibly talk to ASSE student section, or classes about my experience. Write Dean of college about lack of support from site advisors due to being stretched thin in department. Site coordinators had little time for each student, to examine site, to follow-up with students, and provide proper amount of attention to intern reports. (Due to limited resources and all other job responsibilities.)
2. Worked with the organization to make improvements in their internship program.
3. Learn to filter thoughts regarding experiences.
4. Kept in contact better with the safety coordinator for the company.
5. Keep up with some of the peers I worked with.
6. I wouldn't have changed anything. I was able to apply what I learned during my internship to what we were learning in the classroom after my internship.
7. Made me realize that I didn't enjoy the safety profession.
8. I should have taken the offer for employment to get the experience and training...along with a very attractive salary.
9. Shopped around better for 1st job instead of immediately taking the first offer that came along.
10. Interned with a bigger company so I could have a chance to take a job there instead of being out of work for so long after graduation.
11. Take more industrial hygiene classes.
12. Pursue another (2nd) internship-I never dreamed that mine would be so poor. Most classmates had great experiences.
13. I could have been more involved with Worker's Comp. And Program development for safety procedures.
14. Would have signed up for another internship with a different type of company.
15. Put more effort into career searching and submitting resumes.
16. Would have offered to work overtime. I assumed they didn't want me to because they never asked me to. I missed out on a full time job because I didn't work overtime which didn't show commitment to the company in their eyes.
17. Complete more than one intern for a better comparison.
18. Study.
19. Follow up with faculty to see if the work that was done was used
20. review assignments and completed work with faculty advisor to work on areas to improve, strengths, misunderstandings, scope of work, and expectations.
21. I would ask for a full job descriptions training, a goal to be accomplished, a challenging task.
22. Maintain professional contacts.
23. Keep in better touch with contacts made during the experience.
24. Keep in contact with my intern site supervisor.
25. Keep in touch with my supervisor more often.
26. Stay in contact with Key Personnel.
27. More time with plant physician and nurses.
28. Kept in contact with my internship boss.
29. Communicate my concerns about my experience with my faculty coordinator.

30. Attempted to stay in touch with contacts more in order to provide further career opportunities.
31. Keep contact with internship company.
32. Stayed in contact with people I worked with.
33. Do better to keep in touch with the contacts I've made.
34. Accept a position which I could utilize my knowledge towards a meaningful project/goal.
35. Keep in touch with mentor more frequently.
36. Determine means for improvement.
37. Keep in touch with my internship supervisor to keep the contacts up to date.
38. Maintained communication with my supervisors and worked toward possible future employment.
39. Evaluate necessary courses for specific industry.
40. Continue to improve presentation skills and take some human relation class to improve on interacting with workers.
41. Develop professional contacts.
42. Talked to my advisor about what we really should be studying.
43. Keep in contact with the people I worked for.
44. Start the interviewing process earlier.
45. Stay in contact.
46. Continue contact with management team.
47. Study and research new ideas.

Recommendations

1. expand upon assignments to "design, develop, implement and evaluate" programs.
2. Build all possible relationships within the industry.
3. Pick the brains of fellow safety people, and be a sponge, soak up all you can.
4. Make sure you find out about the company
5. find out what tasks you will be performing
6. Put one-hundred percent effort into your tasks.
7. network, and learn as much as you can.
8. Pursue an internship with a well established company that is taking internships in order to develop future talent, not for cheap college labor
9. be professional, and very enthusiastic
10. Keep an open mind and a positive attitude
11. sharpen up on communication skills
12. Be involved in every committee
13. get out from behind the desk and get on the production floor and talk to the employees, and follow you superior everywhere possible-to meetings on the production floor-etc.
14. Make a good decision on your work site
15. put all you efforts into the job position and internship reports.
16. Pay attention to detail.
17. Keep a positive attitude.
18. Seek out opportunities to add to your responsibilities-take the initiative to tackle new issues that come up.
19. Identify what type of industry you would like to work in. Know if you would like to do a safety or I H internship.
20. Ask to be involved in a variety of safety or I H applications.
21. Do more than one internship.
22. Stay organized.
23. Make sure it is what you want to do.
24. Treat all employees with respect, be willing to learn from them.
25. Listen to the people at the job site.
26. Do not be afraid of hard work.
27. Ask for the money you deserve and the mentoring you deserve.
28. Pick the industry which you are most interested in.
29. Enhance communication skills. Take all opportunities to speak publicly
30. You must be able to work well with others.
31. continue learning every day or else you will fall behind.
32. Listen, be willing to learn and ask a lot of questions.
33. Have a clear understanding of what is expected. Clarify what you are interested in and do not take an internship because you have to.
34. Ask a lot of questions concerning safety to your boss; learn all you can about the industry.
35. Get involved at all levels of management.
36. never be afraid to ask how you can help or get involved.
37. Keep a daily log of everything you
38. practical is different from academic; get involved

39. Don't wait! Do an intern after a few safety classes so when you come back to school you can relate them to real life experience.
40. Be sure to question the company you are considering about your duties, housing , etc.(be selective yourself).
41. Do not be afraid to ask questions and speak up about how your internship is going once you start.
42. Make sure you try to touch on as many aspects of safety as possible. Try and interact with all levels of employees.
- 43.
44. Do an internship that lasts longer than three to four months;
45. Do internships in several different industries to maximize exposures to many different situations
46. Seek to do as much as possible, be involved. Even a negative experience can be a great lesson.
47. Be involved in as much as possible.
48. Spend two weeks on the floor and performing the actual jobs
49. Get a job description up front. Find out the reporting structure, avoid positions that report to HR.
50. Spend time on the floor talking to workers at all levels and observe line managers and their interactions with employees.
51. Be able to take constructive criticism.
52. Ask questions and express you opinions.
53. Attend any professional development sessions that are offered.
54. Get a detailed description at the duties to be performed and learn as much as possible about those items before going to internship.
55. Avoid companies that are using intern for busy work and make sure the company is willing to provide students with educational experiences.
56. Talk with everyone (all levels) of the company.
57. Gain as much experience as possible.
58. Look for a well-established EH&S program (learn how to do it right).
59. Complete as many interns as possible before graduation.
60. Make sure the companies are of quality caliber.
61. Think more of what you want out of experience.
62. learn from every situation you are exposed to by reflecting on situation.
63. Work with management every available chance.
64. Do as many internships/coops as you can.
65. Take on as much responsibility as you can.
66. Network as much as possible during your internship.
67. pick a company and a geographical location where you can see a new part of the world.
68. Be aggressive in your projects and in learning and gathering all knowledge possible during your internship experience.
69. Network with everyone possible
70. Look for varied experience in the workplace.
71. Do several internships, to find where their interest lies.
72. work on you people skills.
73. Get paid.

74. Ask questions. Speak up, keep busy.
75. Hold to integrity and honesty.
76. Be dependable
77. Interact with employees as much as possible.
78. Ask questions.
79. Be professional and respectful.
80. Put forth more of an effort.
81. Interact with employees and management.
82. Clearly understand faculty demands.
83. Clearly understand company requirements.
84. Get paid.
85. Work with your coordinator.
86. Select an internship based on what type of work you think you are interested in, not for money.
87. Take advantage of the knowledge of faculty advisors and internship site contacts.
88. Look for companies that are pro-active in safety.
89. Consider internship "environment"
90. Communicate with faculty.
91. Take a challenging internship.
92. Be willing to work.
93. Network with professionals.
94. Go away from home.
95. Look for the opportunity to apply basic skills.
96. Get as much experience in all areas offered.
97. Ask questions.
98. Be a team player.
99. Identify the safety goals.
100. Look for a company you would be interested in making a career with.
101. Be sure the company is truly interested in safety.
102. Don't worry about compensation.
103. Get involved.
104. You only get out what you put in
105. Search for a company that has a qualified safety professional
106. Pursue internship locations that will pay
107. Tell direct supervisor or sponsor what your expectations are
108. Network, network, network.
109. Research the company
110. Ask as many questions as possible.
111. Interact with all levels from line employees to top management if possible.
112. Make sure you have a level of interest in that particular area (manufacturing, chemical, etc).
113. Make sure you have contact with your coordinator.
114. Don't limit yourself geographically-i.e.-a company is too far from home to consider.
115. Take additional classes in communication and how to develop training programs
116. Determine what your responsibilities will be at your internship site

117. Learn how to interact with management, devise training programs and prioritize your time.
118. Be willing to accept a lot of responsibility.
119. Ask a lot of questions.
120. Ask to be involved in all aspects of H&E.
121. Choose your mentors wisely
122. Learn to value the thoughts, perceptions and opinions of hourly employees.
123. Be clear of your expectations.
124. Hold out for an internship in you field of intent.
125. know exactly what you will be working on and what is expected of you.
126. Don't let money influence decisions.
127. Work for a big established company.
128. Be prepared to work long hours.
129. Act as though you are being interviewed every day.
130. Listen before speaking.
131. Ask what specific duties you are responsible for.
132. Research the company.
133. Network.
134. Be sure to know your role.
135. Attempt to focus in on organizations with an established internship program.
136. Investigate your housing options.
137. Find out what is expected of you.
138. Do multiple internships.
139. Find a place that will interest you.
140. Take positions in companies and locations where you would be willing to work after graduation.
141. Recognize that people are the key to success.
142. Take a job far from home.
143. Take a job you are interested in.
144. Research the industry.
145. Require specific job duties.
146. Get as involved as possible.
147. Look for an area that truly interests you.
148. Perfect writing skills. Use internship as a place to hone speaking skills.
149. Make sure to receive written job responsibilities.
150. Choose an industry you could see yourself working in forever
151. Research pay before beginning internship.
152. Seek out pharmaceutical or chemical companies.
153. Find an area of interest.
154. Pay attention.
155. Get involved. Be a part of every aspect.
156. Take a job where management is concerned.
157. Pursue an internship immediately.
158. Research your organization.
159. Ask a lot of questions.
160. Pursue an internship with industry you wish to establish a career with. Do research.

161. Be sure that goals are well defined.
162. Be sure to understand your responsibility.
163. Be sure internship is challenging enough.
164. Choose an internship in an industrial food processing facility.
165. Do it away from a University.
166. Choose an intern that has clear responsibilities.
167. Become involved.
168. Try to find one with you career interest.
169. Pick a company that has job opportunities
170. Get out in the plant and learn about it.
171. Interview with a lot of companies.
172. Make sure you are given the opportunity to be involved.
173. Choose a location that offers variety.
174. Find a company you are interested in.
175. Make sure you will report to a safety professional with experience.
176. Most importantly, learn to interact with management.
177. Look for a large company.
178. Work 18-hour days.
179. liked to have more control
180. I would have liked to perform more tasks and learn more than I did.
181. Take the internship opportunity to take on the big challenge, the tough assignment, or difficult role.
182. expanded to two instead of just one
183. Once in the internship ask questions
184. Younger (traditional) students should try for two or more internships
185. Be ready to wear a lot of "hats" (especially with a small company).
186. Do as many internships as you can
187. If possible try and do more than one internship.
- 188.

Appendix F: Survey – ABET 2000 by C. Cates

Survey - ABET 2000 "Attributes of an Engineer"

Beginning in the year 2000, the Accreditation Board for Engineering and Technology will be using a new set of criteria to assess the effectiveness of Engineering programs for accreditation purposes. In the past the emphasis has been on the curriculum containing certain courses. In the future the emphasis will be on student learning outcomes. Engineering programs must demonstrate that their graduates have these eleven "Attributes of an Engineer." In preparation for this change in emphasis, we are asking that you please complete this survey. The purpose is to get a sense of how well your education at the University of Cincinnati is preparing you regarding the "Attributes of an Engineer".

My major is _____

I have completed _____ co-op quarters and based upon that:

I. I would assess my ability to apply knowledge of mathematics, science and engineering as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

II. I would assess my ability to design and conduct experiments as well as to analyze and interpret data as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

III. I would assess my ability to design a system, component, or process to meet desired needs as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
_____ % from my co-op experience
_____ % from other (please specify) _____
100 %

IV. I would assess my ability to identify, formulate and solve engineering problems as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
_____ % from my co-op experience
_____ % from other (please specify) _____
100 %

V. I would assess my ability to function on a multi-disciplinary team as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
_____ % from my co-op experience
_____ % from other (please specify) _____
100 %

VI. I would assess my understanding of professional and ethical responsibility as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this understanding came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

VII. I would assess my ability to communicate effectively as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

VIII. I would assess myself as having the broad education necessary to understand the impact of engineering solutions in a global/societal context on the level of:

Excellent	Good	Satisfactory	Fair	Poor

I believe this education came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

IX. I would assess my recognition of the need for and the ability to engage in lifelong learning as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this recognition came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

X. I would assess my knowledge of contemporary issues as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this knowledge came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %

XI. I would assess my ability to use the techniques, skills and modern engineering tools necessary for engineering practice as:

Excellent	Good	Satisfactory	Fair	Poor

I believe this ability came:

_____ % from my classroom experience
 _____ % from my co-op experience
 _____ % from other (please specify) _____
 100 %