

DEVELOPING STANDARDS FOR UNDERGRADUATE UNIVERSITY  
CONSTRUCTION EDUCATION INTERNSHIP PROGRAMS

A Dissertation

by

CASSANDREA JANE HAGER

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2005

Major Subject: Architecture

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## ABSTRACT

Developing Standards for Undergraduate University

Construction Education Internship Programs. (May 2005)

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Personally observed variability among construction education internship programs prompted this investigation. The schools of construction that form the Associated Schools of Construction (ASC) encourage its members to provide curricula that produces qualified professionals for the construction industry. There is agreement within ASC that a practical component along with classroom curriculum is needed for construction students' education (Senior, 1997). Although construction programs have different ways of accomplishing this experiential component, most do have some sort of internship or cooperative program (Chapin, et al., 2003). Construction internships vary greatly from one program to the next – in length, supervision, academic deliverables, and whether credit is earned. No common set of internship field experience standards or best-practices guidelines have been developed for construction education.

This study was divided into three subproblems. Subproblem One describes the status of construction internship programs currently administered in selected American undergraduate universities. Subproblem Two identifies elements that students, companies and schools perceive to support valuable, satisfying internship experiences.

And, Subproblem Three incorporates findings from Subproblems One and Two to identify common elements to provide a structure for construction internship programs, in order to develop a set of guidelines for construction education internship programs.

Three constituencies were surveyed: 1) university undergraduate construction programs, 2) construction companies, and 3) students of the respective construction programs. The school survey utilized ASC membership rosters to survey 91 schools, with 56 participating (62%). The company survey randomly sampled 200 of the Top 400 U.S. Construction Companies listed in Engineering News Record's ENR Sourcebook 2003, with 75 participating (37.5%). The student survey had 31 students from eleven schools in nine different states voluntarily participate.

Univariate analyses on only one variable at a time served to describe the survey population, and by extension, the population from which the sample was selected. The data were analyzed utilizing frequency percentages and summary averages including mode and mean.

Based on the findings of this study, it was concluded that a set of "best-practices" guidelines were needed for construction education internship programs. A set of best practices guidelines for developing construction education internship programs are provided.

## DEDICATION

I want to dedicate this dissertation to my family, friends, and colleagues that made this incredible journey possible. To my parents Wayne Douglas Tiner and Nancy Jane Reynolds Tiner, thank you for providing guidance, encouragement and a place to stay when at A&M. To my dear friend Martin Thomas Vader, thank you for providing unconditional emotional support and motivation; and for keeping my car running so I could travel to school. And last, but certainly not least, to my colleagues Dr. Ralph Borchers and Dr. Andy Batey, Jr., thank you for your unwavering friendship, dedication and resolve. Without your continual stimulus, I could not have completed this arduous task.

## TABLE OF CONTENTS

	Page
ABSTRACT .....	iii
DEDICATION .....	v
TABLE OF CONTENTS .....	vi
LIST OF TABLES .....	viii
LIST OF FIGURES.....	ix
CHAPTER	
I INTRODUCTION.....	1
Overview .....	1
Statement of the Problem .....	3
The Subproblems.....	4
The Objectives.....	5
Statement of the Procedure .....	5
Limitations of the Study .....	7
Assumptions of the Study .....	8
Definitions and Terms .....	8
Importance of the Study .....	10
II REVIEW OF THE LITERATURE.....	11
Introduction .....	11
An Historical Overview .....	11
Studies That Explore the Effects of Structured Internships on Subsequent Student Academic Performance.....	13
Studies That Describe the Student, Industry and Academic Benefits of Internship. ....	15
Studies That Examine Student, Company and University Perceptions Regarding Internship. ....	20
Literature That Describes the Status of Internship, Experiential or Cooperative Learning Experiences. ....	22
Literature That Suggested Ways to Structure or Develop Guidelines for Implementing an Internship Program. ....	29
A Pilot Study .....	36
Summary .....	63

CHAPTER	Page
III	METHOD..... 65
	Introduction ..... 65
	Research Methodology ..... 65
	The Specific Projected Treatment of Each Subproblem..... 66
	Participants, Materials and Procedures ..... 71
	Criteria for Coding Data ..... 74
	The Validity and Reliability of the Study ..... 75
IV	RESULTS..... 81
	Restatement of the Objectives ..... 81
	Subproblem One ..... 81
	Subproblem Two..... 106
	Subproblem Three..... 123
V	SUMMARY AND CONCLUSIONS ..... 126
	Introduction ..... 126
	Review of the Findings ..... 127
	Limitations ..... 141
	Educational Implications..... 142
	Conclusions ..... 143
	Recommendations for Further Study ..... 151
	REFERENCES ..... 153
	APPENDIX A ..... 157
	APPENDIX B ..... 165
	APPENDIX C ..... 179
	APPENDIX D ..... 187
	APPENDIX E ..... 189
	VITA ..... 218



## LIST OF TABLES

	Page
Table 1	Internship as a Requirement for Graduation. .... 87
Table 2	Internship “Encouraged” Before Graduation. .... 88
Table 3	Participation in an Internship. .... 89
Table 4	Participation by Company Size and Company Type. .... 89
Table 5	Lengths of Internship. .... 91
Table 6	“Appropriate” Lengths of Internship..... 93
Table 7	Paid Internships. .... 93
Table 8	Tuition Credit Hours Paid for Internship. .... 94
Table 9	Required Deliverables. .... 96
Table 10	Dedicated Faculty. .... 100
Table 11	Dedicated Company Personnel. .... 100
Table 12	Site Visitation by Academic Supervisor. .... 101
Table 13	School Provided Internship. .... 101
Table 14	School Provides a List of Internship Sites. .... 101
Table 15	Industry Advisory Council. .... 102
Table 16	Construction Career Fairs. .... 103
Table 17	University-Wide Career Fairs. .... 103
Table 18	Hired from Career Fair. .... 103
Table 19	Hours Worked per Week. .... 103
Table 20	Work Environment. .... 104
Table 21	Employment After Graduation. .... 105

## LIST OF FIGURES

	Page
Figure 1	Key elements of internship shared across domains. .... 63
Figure 2	Frequency percentages related to “length” of internship programs reported by schools, students and companies. .... 92
Figure 3	Frequency percentages related to each of the “deliverables required” in internship programs reported by schools, students, and companies. This figure refers to the categories of: None, daily logs, organizational charts, formal goals and objectives, and final written report. .... 97
Figure 4	Frequency percentage related to each of the “deliverables required” in internship programs reported by schools, students, and companies. This figure refers to the categories of: Student self evaluation, employer evaluation, contact sheet, site visitation with student, and site visitation with employer. .... 99
Figure 5	The degree to which schools, students and companies rate pre-hire investigation of companies as one reason to provide internship. .... 107
Figure 6	The degree to which schools, students and companies rate pre-hire investigation of students’ abilities as one reason to provide internship. .... 108
Figure 7	The degree to which the constituencies agree that internship provides increased self-esteem for the student. .... 109
Figure 8	The degree to which schools and companies agree that student performance during an internship represents program strengths and weaknesses. .... 110
Figure 9	Collapsed extreme categories for data related to student performance as an indicator of program strengths and weaknesses. .... 111
Figure 10	The degree to which schools, students and companies agree that deliverables required in the internship fairly represent the work accomplished. .... 112

	Page
Figure 11	The degree to which schools, students and companies agree that the interactions between students with professionals are considered valuable. .... 113
Figure 12	The degree to which schools, students and companies agree that internship is a positive experience. .... 114
Figure 13	The degree to which all constituencies of the study would recommend internship. .... 115
Figure 14	The degree to which constituencies agree that schools provide enough guidance for students to be successful in their internship. ... 116
Figure 15	Collapsed extreme categories for data related to the degree to which schools provide enough guidance for students to be successful in their internships. .... 116
Figure 16	The degree to which constituencies agree that schools provide enough guidance for employers to be helpful to students during internship. .... 117
Figure 17	Collapsed extreme categories for data related to the degree to which schools provide enough guidance for employers to be helpful to students during internship. .... 118
Figure 18	The degree to which schools and students agree that the length of internship program is appropriate. .... 119
Figure 19	The degree to which constituencies agree that the internship experience helped students in subsequent academic performance. .... 120
Figure 20	The degree to which constituencies agree that internship helps students clarify career choices. .... 121
Figure 21	The degree to which schools, students and companies agree that internship provides the opportunity for students to synthesize classroom knowledge into practical application. .... 122

## CHAPTER I

### INTRODUCTION

#### **Overview**

One way construction companies hire construction management personnel is through the recruitment of students graduating from higher education construction programs. Higher education construction programs call themselves by many different names including construction science, construction technology, construction engineering, building construction, and architectural engineering to name a few. Construction programs are also housed within many different colleges or schools, including: engineering, architecture, technology, and applied science. But, no matter the name of the program or it's affiliation to a college or school, it is the commonality of these higher education construction programs that is important -- to provide the construction industry with qualified, well-educated students that can perform successfully as managers in the field of construction. The 93 schools of construction that form the Associated Schools of Construction (ASC), encourage its members to provide a curriculum that produces qualified professionals to work in the construction industry. Within the ASC there is agreement that a practical component, as well as the classroom curriculum, is needed for the construction student's education (Senior, 1997). According to Engineering News-Record, "Many schools encourage students to add internship or

cooperative education programs to their academic experience, but less than half of ENR's surveyed schools require them for graduation. Most require three to five months on average. Some programs insist on relevant work, with employer and student required to submit a job description in advance. A weekly work-log summary to a faculty coordinator is required along with an on-site visit to discuss accomplishments." (ENR, October 29, 2001, p. 30).

Although the construction education programs have different ways of accomplishing this practical experiential component, most do have some sort of internship or cooperative education program (Chapin et al. 2003). The internship is one way of allowing students the opportunity to observe the duties of construction management. One objective of an internship is to give the student meaningful exposure to the construction industry, and to provide the student with a challenging work experience that enhances the classroom experience and exposes the student to the "real world". Practical activities are probably more important than theory in this [construction] field. Furthermore, the best laboratory for construction management is the construction project itself. There is no substitute for knowledge derived from a guided experience in the field. (Senior,1997).

While early studies were concerned with the effects of structured internships on subsequent coursework (English and Koeppen, 1993; Knechel and Snowball, 1987; and Koehler, 1974); several studies cited by Hauck, Allen and Rondinelli (2000) reported using internship to reinforce or enhance classroom knowledge; to improve understanding of the business world by exposure to "real world" problems and situations; and as a

vehicle to improve students' abilities to evaluate and assimilate classroom experience into practical application . Additional research reports that internship programs are utilized for pre-hire investigation by companies and students. Internship has been shown to be a vehicle for both recruiting and screening employees. Companies observe students' capabilities before hiring them full-time, while filling staffing needs. Students utilize internship as a means of pre-hire investigation of companies and their work cultures, to help clarify career choices, and to establish a valuable network or connection for life after graduation (Beard, 1998). Internship has also been shown to improve permanent placement opportunities (a foot-in-the-door), to lessen turn-over rates, increase job satisfaction, and increase starting salaries (Coco, 2000). Other studies support improving academic-industry relationships through the development of partnerships, collaboration and industry advisory councils (Hayhoe, 1998; and Tovey, 2001). And lastly, one study suggested guidelines for a safety internship program within industries in the United States, reporting that standard internship guidelines would not only promote consistency in program structure, they would also ensure that the needs of all involved are considered during planning and implementation (Ferguson, 1998). These guidelines were designed to help interested groups develop a successful safety internship program.

### **Statement of the Problem**

Construction education internships vary greatly from one construction education program to the next – in length, type of supervision, amount of academic deliverables, and whether students receive academic credit. In the Department of Technology at Texas

State University – San Marcos (formerly Southwest Texas State University), variations in undergraduate internship programs were reported, to the investigator, to result in frustration and dissatisfaction of the internship program for many employers and students. In the field of construction education no common set of internship field experience standards or best-practices guidelines have been developed for the discipline.

### **The Subproblems**

The study was divided into three subproblems:

#### **Subproblem One**

The purpose of this study of construction education programs was to describe the internship programs currently administered in selected U.S. university undergraduate construction education programs; recognizing the variability across programs.

#### **Subproblem Two**

To identify and evaluate the elements that students, employers or construction internship supervisors and faculty perceive to result in valuable, satisfying internship experiences; recognizing a commonality across constituency.

#### **Subproblem Three**

From the results of the first and second subproblems, to identify the elements to incorporate into the structure of the construction internship, in order to develop a set of “best-practices” guidelines or standards for the construction discipline.

## **The Objectives**

The first objective of this study was to describe construction internship programs in selected American universities reporting distinct characteristics that vary between programs.

The second objective of this study was to identify elements that students, employers, and faculty perceived to support a valuable, satisfactory internship experience.

The third objective of this study used the findings from the first and second objectives, to identify the elements that provide construction education programs with a common structure for their construction internship programs; in order to develop a set of “best-practices” guidelines or standards for internships in the construction discipline.

## **Statement of the Procedure**

The procedure for the study was as follows:

1. A review of the internship literature was conducted and a research problem formulated. A pilot study was conducted prior to development of study design and data collection.
2. A research proposal was prepared and submitted to the faculty research committee. Upon approval, the proposal was submitted to the Office of Graduate Studies for Admission to Candidacy for the Ph.D.
3. The Texas A&M University Institutional Review Board Application – Protocol for Human Subjects in Research was prepared and submitted for approval. The



IRB Protocol 2002-444 (Exempt from Full Review) was approved for one year and renewed for two additional years.

4. Acquired Certificates of Completion for satisfactorily completing: 1) the IRB Office of Texas A&M University Human Subjects Research module for the year 2004, and 2) the Human Participants Protection Education for Research Teams on-line course sponsored by the National Institute of Health.
5. Three survey questionnaire instruments were developed: School Survey, Student Survey, and Company Survey, each containing: Part One (describes the current internship programs) and Part Two (rates the degree to which schools, students, and companies agree or disagree with predetermined statements concerning the internship experience.)
6. On-line survey instruments were prepared and submitted for access on a secure university website. Storage of the three databases (confidential coded responses) were hosted on a secure server.
7. A general description of the study was provided to all potential participants. When the waiver of the requirement to obtain signed informed consent was granted under 45 CFR 46.117 (c), a study information sheet with all elements of consent was provided to all study participants.
8. Additional e-mail survey instruments and paper-based survey instruments were prepared and distributed as necessary for increased participation. Each survey instrument distributed was accompanied by a study information sheet.

9. After all voluntary participants responded to the three questionnaires, responses were coded and recorded in the respective databases. Data Cleaning was completed before data analyses were performed.
10. Data were analyzed using appropriate statistical procedures.
11. Conclusions and recommendations for further study were formulated.
12. The final report was written.

### **Limitations of the Study**

The following limitations applied to the study:

The study was limited to university undergraduate construction education programs in the United States.

The study was limited to students within those university undergraduate construction education programs in the United States that actually participated in an internship or experiential component.

The study was limited to construction companies listed in the top 400 construction companies in the United States by Engineering News Record in the ENR Sourcebook, 2003.

## **Assumptions of the Study**

### **First Assumption**

The Likert scale being used in part two of the questionnaires is a discrete scale from one to five, with 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

### **Second Assumption**

Respondents will respond truthfully to perception questions.

### **Third Assumption**

Respondents will have the technological capability to participate in an on-line internet-based survey.

## **Definitions and Terms**

The following terms were defined to clarify their proper interpretation within the context of the present study:

Applied learning programs such as internships and cooperative education programs (co-ops) combine academic learning with supervised practical experience and serves as a bridge from classroom to the workplace (Cates-McIver, 1999). According to Cates-McIver, there are distinctive differences between cooperative education and internship programs.

Cooperative education was defined as a professional development program that enables the student to alternate sessions of full-time paid employment with sessions of

on-campus study. The most popular plan, called the “alternating plan” allows students to alternate semesters of full-time study with semesters of full-time work with at least two work terms required. The “half and half plan” or “parallel plan” involves part-time work and part-time study. The “summer plan” is similar to an internship because the student works during the summer, but differs in that the student is given the option to work a second work period. A student must extend their education to a five-year curriculum to accommodate the alternating schedule.

Internship was defined as a term often used to identify the phenomenon of the experiential learning component of an academic curriculum. This experiential component is commonly employed to help students utilize classroom knowledge or extend theory into practice or application. Senior (1997) posited that internships immerse the student in an actual supervised professional situation. Gross (1981) defined an internship as a practical experience outside the educational institution in an organization that deals with the line of work one hopes to enter. More specifically, an internship is a relationship with a company or organization in which a student is treated as a quasi- employee. (Senior, 1997).

Cates-McIver (1999) divides Internships into two categories, academic and non-academic. In an Academic Internship in order to receive academic credit, the internship work must be associated with the student’s major and all parties, including the university, the employer, and the student agree to the terms. The institution usually determines whether academic credit will be based on prescribed number of hours and post-internship reports describing the experience. On the other hand, a Non-Academic

Internship was defined as a two-party agreement between a student and an employer.

The student may receive relevant work experience, but does not receive academic credit.

Internships can usually be completed along with classes within a typical four year period.

### **Importance of the Study**

This study represents a significant step toward furthering the body of knowledge within university undergraduate construction education programs across the United States. As this field of research is in its infancy and underrepresented, this project will help form a foundation upon which additional research may be built. The collection and analyses of these data play a key role in ensuring that the needs of industry as well as students and society are being addressed. It was important to first investigate the disparity or variability across construction programs regarding internship, in order to understand if this variability may be resulting in frustration or dissatisfaction for employers and students. Secondly, it was important to identify the elements that schools, students, and companies perceive to result in valuable, satisfying internship experiences. From investigating variability across programs and identifying elements of commonality among the constituents; comparisons and recommendations are made to benefit construction education internship programs. This study not only describes the status of construction education programs at the present time, it also serves to guide undergraduate university construction education curriculum development concerning the experiential component referred to as *internship* and develops a set of “best-practices” guidelines or standards for the discipline.

## CHAPTER II

### REVIEW OF THE LITERATURE\*

#### **Introduction**

Internships have become a common place experiential component in many higher education curricula. Evidence to support this experiential learning component called internship was found in many studies. This review of internship literature was divided into five areas of study: 1) studies that explore the effects of structured internships on subsequent student academic performance; 2) studies that describe the student, industry and academic benefits of internship; 3) studies that examine student, company and university perceptions regarding internship; 4) literature that describes the status of internship, experiential or cooperative learning experiences; 5) literature that suggested ways to structure or develop guidelines for implementing an internship program; and, 6) a pilot study.

#### **An Historical Overview**

The many schools of construction that form the Associated Schools of Construction (ASC), encourage its members to provide a curriculum that produces qualified professionals for the construction industry. Within the ASC there is agreement that a practical component, as well as the classroom curriculum, is needed for the

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\*Part of this chapter is reprinted with permission from “A Comparison of Four Domain Area Standards for Internships and Implications for Utilization in Undergraduate Construction Education Internship Programs” by Hager, C., Pryor, C., and Bryant, J., 2003. *Journal of Construction Education*, Volume 8, Number 3, pages 157-179. Copyright 2003 by the Journal of Construction Education, a publication of the Associated Schools of Construction (ASC).

construction student's education (Senior, 1997). Senior states that practical activities are probably more important than theory in this field (i.e. construction management education). The best laboratory for construction management is the construction project itself. There is no substitute for knowledge derived from a guided experience in the field. Senior presents a summary of several major techniques used to incorporate practical elements into a construction curriculum, with some insights into their implementation. Simulation and gaming, case-based instruction, and internships are discussed.

As part of Senior's study (1997), an informal survey of ASC faculty revealed that the need for an internship as part of the construction curriculum is almost universally supported by faculty across the country. The study also revealed that the implementation of internships varied widely among institutions and that the level of intervention was also quite different among colleges. The most important aspect of internship administration appeared to be the assignment of relevant duties to interns, and the means for accountability from sponsors and interns, achieved by explicitly defining college expectations, and by monitoring the performance of sponsors and interns via visits and written reports. Senior found that major problems of implementation include: appropriate monitoring, length of the internship, how and if academic credit should be given, and whether the internship should be required or optional. He concluded that regardless of the implementation approach, internships are an increasingly popular method of incorporating practice into the construction curriculum.

As cited by Hauck, et al. (2000), "Many argue the practical experience gained from a structured internship is important to lay groundwork in preparing students for

careers in their chosen fields.” According to the AAA Committee on Internship Programs, as cited by Knechel and Snowball (1987), this experiential component reaps such benefits as: 1) exposure to techniques and problems not encountered in a classroom environment, 2) enhances understanding of the business world, 3) improved ability to evaluate and assimilate classroom experiences, and 4) increases motivation to master subject material upon returning to school. Flesher, Leach and Westphal (1996) cite other internship benefits to include: 1) opportunities for permanent placement with the sponsoring company, 2) clarifying career choices, and 3) increasing student’s self-esteem.

### **Studies That Explore the Effects of Structured Internships on Subsequent Student Academic Performance**

Four empirical studies explore the effects of structured internship programs on subsequent coursework. While Koehler (1974), Knechel and Snowball (1987), Kwong and Lui (1991), and English and Koeppen (1993) examine accounting students’ post-internship scholastic performance; Hauck et al. (2000) investigates construction management students’ performance in subsequent coursework.

In examining accounting students’ post-internship scholastic performance, findings indicate that there is a tendency for both accounting and general grades to improve following an internship (Koehler, 1974). Because the Koehler study lacked a control group of non-interns, and the findings did not indicate statistical significance, Knechel and Snowball (1987) replicated the study to include these two design features.



In this second study of interns, Knechel and Snowball found that while average performance across all courses did not differ significantly between the two groups, differences were found in the undergraduate auditing course. In this case, interns performed significantly better than non-interns. In another study of accounting students' post-internship scholastic performance, English and Koeppen (1993) found that internship students perform significantly better than non-internship students in accounting courses and in overall grade point average (GPA) subsequent to the internship semester. These findings contradicted the prior research and supported accounting internships as tools to enhance students' knowledge and motivation.

In an expansion of the accounting studies, Hauck et al. (2000) investigated construction management students' performance in subsequent coursework. The GPA's of the internship group increased slightly (1.09%), but was not statistically significant. Results of this research were inconclusive. Overall the internship group outperformed the non-internship group in subsequent academic performance but the between groups was not statistically significant. Regardless of the performance in subsequent coursework and questionnaire results, the fact that the interns maintained their GPA while the non-interns did not, suggests the internship probably had a positive effect on the academic performance.

An additional study by Knouse, Tanner and Harris (1999) examined the relationship of business college internships to college performance and to subsequent job opportunities. The study revealed that students with internships had a significantly higher overall grade point average, were somewhat younger upon graduation, and were

more apt to be employed upon graduation than students without internships. This study and others have shown the efficacy of internships both for improving performance while still in college and for improving the opportunities for finding a job upon graduation. The studies of Dennis, 1996; Healy & Mourton, 1987; Kane, Healy & Henson, 1993; and Taylor, 1988 (as cited by Knouse, et al., 1999) revealed that internships can help students develop immediate skills that can improve course performance, such as better time management, better communication skills, better self-discipline, heightened initiative, and an overall better self-concept. Additionally, Hall, 1976 and Kane et al., 1992 (as cited by Knouse et al., 1999) reported that the internship experience should help students focus their career choices, hone their job skills, personally focus their work values and decrease their anxiety about the job search. One implication for college internship programs was that colleges should focus more effort on advertising the benefits of internships. A list of recommendations for improving internship opportunities was provided.

### **Studies That Describe the Student, Industry and Academic Benefits of Internship**

A study by Flesher, Leach and Westphal (1996), reported the benefits, the required investments and a strategy to achieve specific goals that are necessary to create an effective internship program. The many benefits of internship to students, industry and academia are presented here. It was reported that internships provide students with many benefits including: career decision support; realistic expectations of the industry;

behavior models; skill development opportunities; compensation; resume and professional reference opportunities; professional network connections; and opportunities for permanent placement. Internships create opportunities for business to form relationships with specific schools that can lead to collaboration and preferred vendor status. Additional benefits to industry include: flexible staffing, access to current academic curricula and the opportunity to influence curriculum decisions; access to faculty and institutional resources, and staff development. Internships provide opportunities for academic and industry partnerships, elevating the reputation and status of academic programs within the professional community. Additional benefits to academia include: increased credibility of programs; opportunities for recruitment of potential students seeking advanced degrees; curriculum enhancement; enhanced relevance for subsequent course work; program support through funding and advisory council participation; and, consulting opportunities for faculty.

Beard's (1998) empirical study, where accounting administrators reported on administrative and operational issues with internship, investigated whether students received academic credit and the number of hours worked. Beard also looked at the benefits of internship to students, employing organizations and academic institutions. Beard found that it was the companies' ability to recruit and select future employees as the top benefit of internships. Beard concludes that well-organized and carefully supervised programs enhance students' abilities to integrate academic knowledge with practical applications. These experiences improve job/career opportunities after graduation, create relevance for past and future classroom learning, develop work place

social and human relations skills, and provide an opportunity for students to apply communication and problem solving skills. Learning about the profession and gaining practical experience are also important benefits for students. Internships benefit industry by providing a vehicle for recruiting or selecting future employees, providing needed part-time and special project employees, developing linkages with universities, and enhancing the employers' image in the community. For the employing firms, cultivation of future permanent employees and maintaining and improving relations with area schools are important benefits. Accounting programs can benefit from enhanced placement opportunities of graduates, the reinforcement or enhancement of classroom learning, increased support of their programs by industry, and feedback concerning their accounting curriculum. Schools benefit from the linkage with the profession and through the attraction of better caliber students as a result of effective internship programs. Beard goes on to say that the interactions occurring among students, practitioners, and faculty can be invaluable in measuring outcomes of the internship program and the entire program of professional instruction for future accountants. The results of this study provide assistance for those administrators wishing to evaluate the characteristics of their internship programs or help them to establish their own programs.

In an article by Marshall (1999), the author reported that a well designed and carefully structured industrial technology internship often resulted in program benefits such as donations of state-of-the-art equipment, sources for student scholarships, recruiting tool for current industrial employees wishing to upgrade their skills, an avenue for jobs for graduates, faculty industrial sabbaticals, advisory board members, and an

excellent vehicle for increased community public relations. Faculty, as cited by Marshall (1999), states “An internship program can foster closer interaction between the employers and the university, making employers more aware of the educational opportunities and ensuring that the program is responsive to the needs of employers”. The internship provides an opportunity for the student to link theory to practice and to reflect on real world situations with real problems, complex solutions and individual challenges. An internship can provide advantage upon graduation and can clarify future career decisions. Major internship goals are listed as: 1) to provide opportunities for students to integrate and apply skills, knowledge and attitudes developed in the classroom; 2) to provide opportunities to work within an on-going business enterprise, meeting performance standards; 3) to refine planning, communication, and technical abilities in real-world situations while establishing resume-worthy experience; and 4) to demonstrate professionalism and accountability in meeting commitments and make consistent contributions to the employer.

In a professional report, Messmer (1999) offered credit managers advice on how to establish a successful internship program for college students. The report described some benefits to be gained by the company and students; issues to consider when developing an internship program and the establishment of alliances with local colleges and universities. The benefits of internship are reported here. In addition to the work interns perform and the ideas and enthusiasm they bring, the internship can provide such benefits to a company’s recruiting, staffing and leadership development especially in filling key entry-level positions. Students also benefit by gaining practical work

experience and “real world” business perspectives. The development of an internship and establishing alliances are reported later.

In a study by Coco (2000), the role and benefits of internships were reported as the result of a national survey exploring the use of internships in schools that were members of the Association of Collegiate Business Schools and Programs (ACBSP). Internships were reported to be a win-win situation for students, host companies and universities, with end results being almost always a positive experience for each of the parties. Student benefits included higher starting salary and more job offers. Students can check out potential employers. Coco cited Heller (1997) stating that internships are a great way for students to sample a company without committing for life. A list of student benefits included: better understanding of the business world; improved knowledge of industry as related to career path; clarification of personal interests or career ambitions; reduced shock when entering the workplace after graduation; and the possibility of faster advancement for interns than non-interns. Stein (1996), as cited by Coco (2000), stated that “from chief executive officer to entry-level employees, almost everyone in industry agrees that internships are definitely a key to corporate America’s door”. A list of company benefits included: companies can evaluate prospective employees risk-free (assessing a student’s work ethic, attitudes, and technical competence); interns are an inexpensive source of competent assistance without paying benefits; internship gives access to highly motivated and productive employees; and, interns allow for the release of full-time employees from routine tasks. Coco reported that universities benefit from internships in many ways. Internships help validate the university curriculum in a real-

world environment and help the university with student placement upon graduation. Internships can also result in monetary support to the university, guest lecturers, and field trip opportunities. The report concluded that internships have proven to be one of the most important experiences for a college graduate who wants a job after graduation. Employers are using internship as a recruiting tool. Universities see internship as a means of validating and updating their programs and as a way for placing students. The study concluded that all indicators from students, industry, and universities point to an increasing importance and frequency of internship.

### **Studies That Examine Student, Company and University Perceptions Regarding Internship**

A study by Hite and Bellizzi (1986) examined marketing student expectations regarding internship. Their research was based on data collected from a sample of 441 college students who responded to 24 items regarding various aspects of internship programs. Findings revealed that students viewed internships as valuable learning experiences for which they should receive academic credit, be paid, and earn only a pass/fail grade and they should receive formal training and have direct supervision during the internship. Hite and Bellizzi noted that too often lack of understanding of the internship expectations lead to disappointment for firms and students and suggested that better understanding of student expectations would improve the process and outcome of the internship programs.

Cannon and Arnold's (1998) research among marketing students investigated their expectations of internships to include such issues as the overall work level, academic standards, and practical value of an internship. This study provided insight into the expectations of students regarding internships and how these expectations changed since the 1980s. Students were found to place growing importance in the internship to provide the competitive edge in obtaining a job, and less as a vehicle for furthering their education.

Knemeyer and Murphy (2001) provided the results of one of the first empirical studies to report employer perspectives concerning logistic internships. The results were from a survey of U.S. companies that recently employed logistics interns. The research hoped to focus efforts to improve the valuable experiences of internship, as well as, identify needs for additional investigation. The results indicated that most employers expressed less than total satisfaction with their internship programs.

The Cook, Parker and Pettijohn (2004) literature described an empirical study of students' attitudes toward specific elements of an on-going internship program (a 10 year longitudinal study). In the ten year period, 351 business interns were surveyed from 12 different colleges and universities. Findings reported that students gained significant benefits from internship in terms of overall value (89%); it enhanced students' abilities to work with others (87%); and students perceived the largest benefit to be social ones including developing people skills and enhancing personal maturity. The study reported the relationship of classroom knowledge to actual work experience. It reported that students had more confidence in finding jobs upon graduation (perceiving an overall



advantage over non-interns); and it reported that career choices were solidified. Cook et al. stated that the perceived value of internship and attitudes toward it remained relatively constant over the long period. The results lead to the conclusion that students, regardless of time and university affiliation, regard internship programs as positive. The study reported that if the mission of the university is to graduate well-rounded individuals, the internship experience needs to be required rather than optional. It goes on to state that because almost one third of students indicated they could not or did not connect classroom lectures and theory to what they experienced in their internship, universities need to determine if what is being taught is indeed relevant in the “real world.” Changes to content and presentation may need to be considered. The results of this study support internship program expansion for all stakeholders – students, employers and universities.

### **Literature That Describes the Status of Internship, Experiential or Cooperative Learning Experiences**

Early literature describing the status of internship included two studies in accountancy – Smith (1964) and Lowe (1965). The study by Smith reported on the status of the accounting internship, its level of interest in accounting education, and the place internship should have in training future accountants. Smith stated a loss of interest in internship for the following reasons: short supply of students with a high demand of paying jobs, inconvenience of location and inconvenience of timing, less responsive firms, improvements in teaching methods, and the inability of schools to provide faculty

to supervise and generate interest in the programs. The chief reason given for participating in internship previously was to secure field experience as a means of maximizing subsequent classroom studies. Additionally, the internship may be the only opportunity the student has to bridge the gap between classroom theory and business practices before entering the profession. An internship was defined as an experience that provides the student with a broad perspective of accounting practices by assignment of varied activities, jobs, projects, companies or programs. At the time this article was published, few argued for internship being a requirement for graduation. An internship should not be allowed prior to completion of the junior year. The usefulness of an internship was doubted in this report. The intern is however given broader and more significant training than that of the run-of-the-mill beginning employee, is observed more closely for prospective managerial ability, and the intern has more flexibility in moving from firm to firm or a different type of employment without prejudice. Respective colleges and universities ultimately decide whether credit is granted toward graduation, but allowing a maximum of three semester hours was reported. An organized program of accounting internships was reported to have existed for about forty years, with ups and downs. The study concluded that a revitalization of a drooping program or the creation of a new program should be considered, with increased importance given to the internship. As a final word, it was reported that in order to have a successful program, a faculty member should be assigned the responsibility of supervising the program, of conferring with students and working with practitioners and

industry personnel on all matters of common interest to the intern, the employer and the college.

The study by Lowe (1965) was designed to evaluate the internship plan employed in public accountancy and to develop current data concerning the ways in which internship programs were operated and the extent to which they were offered in accountancy. Eighty institutions in 34 states, representing all regions of the nation were asked to participate in the study. Seventy-three respondents contributed to the study. Over half of the programs were established between 1950 and 1959, with 19 percent organized between 1960 and 1964. Of all the programs surveyed only three reported that the internship was required. No formal seminars for guidance were given in 44 percent of the programs. Forty of the 73 respondents noted that students were not permitted to enroll for additional coursework during the internship, while 28 were allowed the privilege. Forty-eight reported no research or reading assignments given by the accounting department, while 21 indicated that such projects were required of interns. There was a wide variation in the length of internship with 38 percent of programs from 7-12 weeks, and 18 percent for 4, 5 or 6 weeks, and 13 percent 13-18 weeks. Only four schools reported that a final examination was required. Fifty respondents or 68 percent indicated that they received academic credit for their internship with over half receiving 3 semester hours credit. Fifty-six respondents stated that a written report was required of those 33 were required at the end of the internship. At a majority of institutions surveyed, internship was only available to seniors. Fifteen schools made internship available to juniors. Women students had the privilege of participating in about 75

percent of the programs, but several respondents indicated that they had difficulty placing women interns, especially with national firms. Twenty reported that supervision visits were carried out and one third of the supervising faculty members were given a reduced teaching load. Most schools had required courses or a screening process before a student could engage in an internship. Eighty-three percent of the respondents indicated that both local and national public accounting firms participated. Seventy-eight percent of the programs reported that interns were expected to work as many hours as junior accountants on the same assignment. It was not customary for schools and firms to enter into written agreements. Over ninety percent indicated no written agreement. Compensation of interns varied widely. Over eighty-five percent of interns were paid. Cooperating firms filed periodic reports on intern progress in 43.7 percent of the cases. Final reports only were filed in 13.7 percent and no reports were filed by 29 firms. Seventy-one percent of the students had final interviews with representatives in which their performance was evaluated. Only two respondents indicated that they expected internship to decline, while 35 stated they anticipated internship would grow, and 32 thought that it would remain the same. Eighty-five percent were of the opinion that the internship plan had been of value in placing graduates. Over ninety percent were of the opinion that the internship program increased cooperation and understanding between practitioners and members of the accounting faculty. It was concluded that internship programs strengthened relationships between practitioners and faculty. Former interns encouraged other students to engage in internship. The guidance value of internship was demonstrated with 9 out of 10 former interns indicating that internship clarified career

choices. Other benefits included valuable job contact and internship made subsequent courses more meaningful. Weaknesses were revealed in some cases. A number of programs were too brief to be of great value. Diversification of work activities has not been accomplished in several programs. Supervision of firm was complimentary, but additional instruction was needed prior to beginning of internship. School supervision was a weakness in many programs, with little contact with interns and little control over the quality of the experience. Feedback from students for program improvement was not utilized or effective for schools or firms. Finally, in reports that interns file, student reflection should be emphasized instead of recital of duties performed.

In more recent literature, a study by Beard (1998) was undertaken to determine the status of experiential learning experiences in undergraduate programs of accounting. The study identified the characteristics of internship/cooperative education programs and the program administrators' perceptions of the value of these experiences to students, employers, and accounting programs. The results revealed an increase in internship/cooperative education programs in accounting education. Beard found that approximately 75% of respondents reported having an internship program. Most programs were considered fairly young (less than 10 years old), were for credit only (no letter grade assigned), occurred during the junior year, were paid, and required a written project to be completed by the student. Most programs in accounting do not have full or part-time coordinators, most do not require on-site visits, and most share the responsibility for identifying internship sites with the students and others. Beard concluded that well-organized and carefully supervised programs enhance students'

abilities to integrate academic knowledge with practical applications. These experiences improve job/career opportunities after graduation, create relevance for past and future classroom learning, develop work place social and human relations skills, and provide an opportunity for students to apply communication and problem solving skills. Learning about the profession and gaining practical experience are important benefits for students. Internships benefit industry by providing a vehicle for recruiting or selecting future employees, providing needed part-time and special project employees, developing linkages with universities, and enhancing the employers' image in the community. For the employing firms, cultivation of future permanent employees and maintaining and improving relations with area schools are important benefits. Accounting programs can benefit from enhanced placement opportunities of graduates, the reinforcement or enhancement of classroom learning, increased support of their programs by industry, and feedback concerning their accounting curriculum. Schools benefit from the linkage with the profession and through the attraction of better caliber students as a result of effective internship programs. Beard goes on to say that the interactions occurring among students, practitioners, and faculty can be invaluable in measuring outcomes of the internship program and the entire program of professional instruction for future accountants. The results of this study provide assistance for those administrators wishing to evaluate the characteristics of their internship programs or help them to establish their own programs.

In a recently published study in the *Journal of Construction Education*, Chapin, Roundbush and Krone, (2003) reported additional findings of the earlier survey

conducted during the fall of 1996 by Senior (1997). The purpose of this study was to assess the extent of cooperative education as a recognized segment of the various construction education curriculums. Of the 88 surveys mailed, 43 completed surveys were returned with an additional eleven e-mail follow-up questionnaires for a total of 54 responses out of 88 (61%). It was determined that the majority (91%) of ASC colleges and universities within the Associated Schools of Construction have some type of cooperative education program. Chapin et al. (2003) states that many construction education and industry leaders realize the value of cooperative education. The industry can screen prospective employees and collaborate with education faculty to influence the undergraduate programs to further meet the needs of a future employee. For this study the word “coop” was defined as any work experience that is recognized by the school as part of the expected education experience. It was found that even with the definition there was some confusion over the term “coop”. Some respondents were more accustomed to “internship” or “work study”. Although there is an official distinction between these terms it must be noted that this study used them interchangeably. Major findings included that while 91% of programs have some type of coop program, 58% of the programs require a more formalized experience. Most programs have two work terms, earning three to four credit hours per work term. Students generally pay tuition for the credit hours, work from 400 to 500 hours per work term and earn between \$7.50 and \$10.00 per hour. Coops are usually done during the summer (74%). The programs are evaluated in numerous ways, and administered with several combinations of university staff. The level of satisfaction among participants: students, faculty and

employer, was found to be high with an 8 out of 10 approval rating. Review and evaluation of the student varied dramatically: with evaluation forms by employers, some type of written report (6-10 pages), and jobsite visits as possibilities. In most cases, students were required to keep a journal or diary of daily activities. About half of the programs do not provide jobsite visitation by university personnel. Most schools were confident that coops helped the student, not only find permanent employment, but students were also hired at a higher starting salary. Finally, it is the general perception that the participants, (i.e. students, faculty and employers) were pleased with the coop programs. It must be noted that a few schools were not impressed with coop programs and gave them low marks.

### **Literature That Suggested Ways to Structure or Develop Guidelines for Implementing an Internship Program**

The study by Flesher, Leach and Westphal (1996), reported the benefits, the required investments and a strategy to achieve specific goals in order to create an effective internship program. The reported required investments and the strategies for success are presented here. The investments made by all three participants in an internship need to be balanced against potential returns to determine if a program is viable. Industry investments include: providing dedicated managers to plan and implement the program; staffing support and project supervision; and administrative resources. Academic investments include: providing dedicated personnel and resources to the planning, implementation, and improvement of the program; administrative



services; and dedicated faculty for appropriate supervision. Student investments include: a critical commitment to the internship, including accepting responsibility for self-directed learning and performance; additional training and preparation; possible travel or relocation; clothing, materials and equipment; and self-esteem. The study also revealed a strategy for creating a success internship program. The key to success is to develop a relationship among the student, employer and school; with open communication and mutual trust. Flexibility was considered a prerequisite. Elements of a successful strategy include: business, school and student strategies. Business strategies include: focused projects that provide specific goals against which staff can base progress and evaluation reports; realistic expectations, balancing the learning needs of the student with performance expectations; a primary supervisor for support and expertise; and diverse partnering opportunities with many schools. School strategies include: development of administrative materials and documentation; assignment of one primary contact or supervisor; faculty that are willing to answer questions, provide resources, and spend time onsite assisting partners; and continued development of diverse partnering opportunities. Students should envision the internship as one part of an individual career development plan. It is important that students: research the skill requirements and time expectations; evaluate the skill or environment exposure needs; plan logistics such as arrangements for travel, time off from other jobs, and family obligations; show initiative and contribute to projects; and request frequent and thoughtful feedback. The report concluded that careful planning reduces risk and increases return; and that companies,

schools and students must vision the internship process as a larger effort with long-term effects.

An article by Marshall (1999) looked at professional internships as a requirement for graduation. The purpose of this article was to provide the rationale for implementing a required professional internship program within an industrial technology program; to present a typical internship portfolio documentation package of assignments each intern completes as part of the internship experience; and lastly, to examine the crucial role of the professional internship coordinator. The first purpose of this study was to provide the rationale for implementing a required internship program. The article reported that a well designed and carefully structured industrial internship often results in program benefits such as donations of state-of-the-art equipment, sources for student scholarships, recruiting tool for current industrial employees wishing to upgrade their skills, an avenue for jobs for graduates, faculty industrial sabbaticals, advisory board members, and an excellent vehicle for increased community public relations. Marshall (1999) quotes “An internship program can foster closer interaction between the employers and the university, making employers more aware of the educational opportunities and ensuring that the program is responsive to the needs of employers” (Faculty, 1998, p.1). The internship provides an opportunity for the student to link theory to practice and to reflect on real world situations with real problems, complex solutions and individual challenges. An internship can provide advantage upon graduation and can clarify future career decisions. “Upper class standing is important to optimize the internship experience” (Marshall, 1999, p. 3). Although the self-directed experience develops critical

management abilities such as decision-making, time management, and scheduling, there must be close and frequent coordinator interaction and monitoring. The second purpose of this study was to present the elements of the typical internship portfolio. Portfolio assessment is recommended with typical elements including: student resume, company organization chart with mission statement or goals, student performance goals, daily logs, self-evaluation with reflection, and a final written evaluative report. The third purpose of this article was to examine the crucial role of the professional internship coordinator. Marshall reported that the hosting firm plays a vital role toward the success of the internship program by the assignment of intern's professional responsibilities and providing the industry supervisor with guidance. The student is expected to be exposed to various aspects within the company and will be paid at a level agreed upon, while no permanent employment is being offered. The intern's industry supervisor also completes intern performance evaluations. According to Marshall (1999), the university coordinator's role involves recruitment, administration, guidance, coordination, and a great deal of quality control. The coordinator must be readily available to assist the student or the hosting firm. The communication process between the "triad" – student, hosting firm and university coordinator, must occur prior to and continuously throughout the experience. The coordinator is the established liaison with the industry, maintains the historical relationship, and insures the quality and consistency of the program. The university coordinator conducts site visitations and develops a written evaluation of the intern.

A professional report by Ferguson (1998) suggests guidelines for safety internship programs within industries in the United States. As with other disciplines, internships have long played a major role in safety curricula. The Accreditation Board for Engineering and Technology (ABET) requires that accredited safety degree programs include an internship or co-op course, but the board provides limited guidance on the structure of the internship. This article presented 10 general guidelines designed to help interested groups develop a successful safety internship program. One rationale for the guidelines included the statement, “Standard internship guidelines would not only promote consistency in program structure, they would also ensure that the needs of all involved are considered during planning, and implementation. The challenge to educators is to design a program that meets the needs of the university, faculty, students and the internship site” (Ferguson, 1998, p.1). It was reported that although no program can meet all the needs, a successful program attempts to address as many as possible during the design and implementation stages. The ten guidelines included: 1) Define purpose and objectives; 2) Develop criteria for student participants; 3) Develop criteria for internship sites; 4) Provide flexibility for timing duration; 5) Provide orientation for all involved; 6) Establish specific evaluation criteria; 7) Encourage Collaboration; 8) Review legal statues for non-paid interns; 9) Appoint a faculty coordinator; and 10) Evaluate the program.

Earlier, the report by Messmer (1999) discussed benefits of internship for students and companies. Here, the issues to consider when developing an internship program and the establishment of alliances with local colleges and universities are

reported. Messmer stated that internship programs take effort to administer and coordinate and should not be initiated without careful planning. The program must offer opportunities for professional development, on-going learning and networking. The company needs to invest time, money and the resources necessary to make the process successful for both the intern and the firm. The company needs to provide a range of specific business tasks or projects that will be meaningful to the student. The projects must allow the intern to gain practical work experience. The infrastructure, including office space and computer access, must be sufficiently supported, along with appropriate supervision. Supervisors need to have the time, desire and ability to take on the added responsibility of managing and training interns. Messmer also reports that setting up alliances is important to a successful internship program. Establishing alliances with colleges and universities include making contact with the university advisors in the placement office, meeting personally with faculty of the educational program, and taking part in career fairs, performing guest lectures, and holding open houses. The goals of the internship need to be agreed upon by all parties and should include a detailed job description outlining the intern's specific responsibilities, along with his or her compensation; documentation of assessment with detailed performance appraisal; and the flexibility to adhere to criteria unique to particular schools. Messmer states that there are no formulas for ensuring a successful internship program, but suggests a few specific steps that can improve the process: 1) Look for a good match between the company's objectives and an intern's career aspirations; 2) Set up the structure of the program with sufficient time allocated for a cultural orientation and consistent feedback on progress;

3) Vary the workload, providing a wide range of work experiences keeping less challenging tasks to a minimum; 4) Create a supportive, nurturing environment with at least one mentor (someone other than the supervisor) who can offer guidance, encouragement and general counsel. Also plan occasional social outings or “brown bag” lunch seminars where career advice and information about the firm, and questions about finance and accounting are discussed; and lastly, 5) End on the right note. If no immediate openings are available, keep in touch and know how to locate the intern when the opportunity does arise.

Tovey (2001) quotes, “More important than arguing for the significance of the practical experience itself is identifying what makes the practical experience valuable for the individual student, the employer or supervisor, and the faculty member.” (Tovey, 2001, p. 226). Using an established university internship program of technical communication, Tovey’s study discussed developing connections between industry and the university; and discloses the elements necessary to implement an internship program. Issues of socialization and acculturation of interns into the work environment, the motivation of student employees, and the relationships between education and training/workplace and the academy are discussed. The perceptions of students and their supervisors reveal the significance of these issues for positive experiential learning. Bowers and Nelson (1991), as cited by Tovey (2001), stated “Besides resume items, career opportunities, and job prospects, students benefit from experiential learning by gaining knowledge of how organizations work and how they adapt to those different cultures, when broadening their experiences”. Bowers and Nelson (1991) and Hart and

Glick-Smith (1994), as cited by Tovey (2001), reveal that faculty also benefit from new connections and opportunities beyond the classroom. While business and industry use internships to identify potential full-time and permanent employees, they also benefit from the connections to new methods and concepts, contribute to and support the learning process, and achieve these goals with only minimal effort. Tovey cites Painter (1991) saying that business–academic partnerships provide community support and visibility for the technical communication program, research opportunities and practical experience for faculty. But, the success of the partnership depends on educators, students, and workers listening to each and working together.

Guyton, E. & McIntyre, J. D. (1990) state that it is clear that the roles and responsibilities of the triad members (student, college supervisor, and cooperating supervisor) and goals of the field experiences need to be clearly stated and there must be mutual understanding of them. The triad needs opportunities to discuss personal meanings they each attach to role descriptions. Planned, purposeful discussion about the roles and objectives might alleviate contradictions and frustrations.

### **A Pilot Study**

A pilot study was conducted prior to the development of the study design or the collection of data for the following study. The pilot study entitled, “A Comparison of Four Domain Area Standards for Internships and Implications for Utilization in Undergraduate Construction Education Internship Programs” was conducted and subsequently published in the *Journal of Construction Education*.

Through a thorough review of literature, this pilot study investigated the utilization of standards or guidelines for field experiences in the domain areas of business, political science, allied health professions and teacher preparation; and determined which variables within those standards might serve to guide construction education internship programs.

This investigation analyzed and compared standards and guidelines for field-based experience internships in the undergraduate program domains of: business, political science, allied health professions, and teacher preparation; with construction education. The standards from teacher education were found to be the only standards that specifically defined and specified the development and structure of an internship program and its continued improvement. Because the standards from teacher education were the only standards found, a more comprehensive investigation of additional literature was conducted in all other domain areas of interest.

### **Rationale for Conducting the Investigation of the Pilot Study**

*Do current accreditation standards for construction education programs address the development and structuring of internship programs?*

Ward and Dugger (2002) suggest the importance of standards for construction education programs. They stated that an objective of accreditation, no matter what the academic discipline, is to ensure that certain predetermined sets of standards that have been established by the particular profession are being followed. Accrediting bodies address the need to establish program benchmarks such as student admission requirements, retention, scholastic success and graduate placement data. While not



directly affecting the discipline development, the collection and analysis of these data, where appropriate, play a key role in ensuring that the needs of industry as well as students and society are being met.

According to ENR (2001), two accrediting organizations, the American Council for Construction Education (ACCE) and the Accreditation Board for Engineering and Technology (ABET) represent construction education curricula. The ACCE emphasizes construction management and ABET focuses on construction engineering programs. Another accrediting agency, the National Association for Industrial Technology (NAIT), provides accreditation of construction programs housed within Industrial Technology programs.

It was disappointing to find that a review of these accrediting agency standards found no method for developing or structuring an internship program for construction education. ABET stated that it has no authority to impose any restriction or standardization upon educational programs, nor does it desire to do so. ABET aims to preserve the independence of action of individual institutions and thereby, promotes the general advancement of engineering, technology, computing and applied science education (ABET, 2003). The *ACCE Standards and Criteria for Baccalaureate Programs* simply suggest that students *should* work to obtain construction related experience through participation in internships and cooperative education programs (ACCE, 2003). The *NAIT Accreditation Handbook – 2003* suggests that each major program shall include appropriate industrial experiences such as industrial tours, work-study options and cooperative education, or senior seminars focusing on problem-

solving activities related to industrial situations. The industrial experiences shall be designed to provide an understanding of the industrial environment and what industry expects of students upon employment (NAIT, 2003). Additionally NAIT urges that if cooperative education is either a required or an elective part of the program, then appropriate services be provided to assist the placement and supervision of cooperative education students (NAIT, 2003).

In summary, it was found that accrediting agencies governing construction education programs do not specifically address the development and structuring of internship programs in their accreditation standards.

### **Rationale for Studying: Business, Political Science, Health Professions and Teacher Education Standards**

Because accrediting agencies concerned with construction education provided little or no guidance in the development or structure of internship programs, it was necessary to investigate or review other domain programs. Originally concerned with internships within an industrial technology program, investigation of other disciplines *related* to industrial technology became appropriate. Industrial technology is defined as a field of study designed to prepare technical and/or technical management-oriented professionals for employment in business, industry, education and government (NAIT Handbook, 2003). Following this suggestion, this review investigated domain area standards in undergraduate programs in business, political science, allied health professions and teacher preparation was conducted.

Business was selected for investigation because the constructor is a manager. A construction manager is defined by the construction industry and university construction management programs as a manager who can effectively coordinate activities, people, subcontractors, materials, and financial aspects of a project to bring about a company's continued growth and performance (Adcox, 2000). Utilizing standards associated with economics, finance, principles of management, accounting and business regulations would be beneficial to construction education.

Political Science was selected for investigation because construction is concerned with people, their interrelationships, and the allocation of resources. Construction involves human interaction at several levels, often aligned with economic resources and development. The ability to communicate and understand human behavior are essential assets to the constructor. The greatest challenge in construction management is to bring together all the project resources, in the correct quantity, at the optimum time.

Allied Health Professions was selected for investigation because construction is a practice-oriented profession much like health professions. Although the traditional medical internship occurs beyond the undergraduate education, the allied health professions complete an experiential component during undergraduate study.

Teacher preparation was selected as a domain of investigation because similar to construction, teaching is also a practice-oriented profession. Additionally, teacher preparation programs have conducted extensive research concerning internships that involve the student, the faculty supervisor, and the practitioner. Teacher education

programs are also dedicated to the continuous improvement of their teacher preparation programs and provide invaluable information concerning program improvement.

### **Defining “Internship” Within the Four Domain Areas**

The four domain areas analyzed within this investigation use various terms to refer to the experiential field-based component of undergraduate curriculum. The terms include: field experience, internship, and clinical laboratory or clinical practice. Definitions or clarification of the nomenclature within each domain is necessary.

In teacher preparation, internships as a part of cooperative learning programs have been in existence for many years (Moriber, 1999). The pre-service phase of a teacher education program has two major components: early field experiences (pre-student teaching) and student teaching or internship. The early field experience that precedes student teaching has two major purposes: to explore teaching as a career and to practice the necessary teaching skills needed to carry out the professional role. Student teaching (internship) is the capstone experience during the pre-service phase where the intern is placed in a school site for a prolonged period of time, typically for 10-15 weeks (Paese, 1996). These internships are typically undergraduate, but can be found also in post-baccalaureate or alternative programs.

Less consistency exists in business education. Business internships have been defined as any work or field experience undertaken prior to completion of the formal collegiate education, often with little or no university involvement (Smith, 1964). Other reports describe the business internship as the experiential component of an academic curriculum that provides an efficient way to involve students in actual work situations

where students can apply and reinforce classroom knowledge; and can evaluate competing employment opportunities before making a permanent commitment (Koehler, 1974).

In political science, internship is defined as the utilization of practical political involvement adjunct to formal classroom coursework (Hedlund, 1973). Hedlund noted that internships have two primary goals – education and research, and one secondary goal – public service. Political science internship experiences have been developed with political officials in local, state and national level offices; sponsored by institutions of higher learning, public and private agencies, elected officials, private organizations and professional associations (1973).

The medical profession has a long history of supporting internships. Students in these internships assist, learn from, and work with more experienced doctors (Moriber, 1999). The formal term of *intern* in this instance typically refers to a phase of the medical education beyond the undergraduate level. But, a great many undergraduate health profession programs do provide students with experiential learning opportunities through clinical laboratory, clinical practice and internship curriculum. Clinical laboratory and clinical practice courses are more directly supervised and controlled than other undergraduate internships. According to the Commission on Accreditation of Allied Health Education Programs, a student's education should end with a capstone experience to integrate knowledge, behaviors, and professional attributes acquired throughout the curriculum that are necessary to the practice of the health profession (CAAHEP, 2003).

## **Analysis of the Four Domain Areas and Construction Education**

### *Business*

The accreditation agency for business education is the Association to Advance Collegiate Schools of Business (AACSB), formerly the American Assembly of Collegiate Schools of Business. This agency promotes continuous quality improvement in collegiate schools of business. Standards for business administration were first set in 1919. In 1980, AACSB adopted additional standards for undergraduate and master's degree programs in accountancy. In 1991, mission-linked accreditation standards and procedures for undergraduate, master's, and doctoral degree programs were created. According to the Preamble of AACSB, Member schools reflect a diverse range of missions. Diversity is viewed as a positive characteristic to be fostered, not a disadvantage to be reduced or minimized. Therefore, one of accreditation's guiding principles is the tolerance, and even encouragement, of diverse paths to achieving high quality in management education (AACSB, 2003).

No standards directly specifying the development or structure of business internship programs were found, therefore a review of literature concerning business internships was conducted. The literature concerning business internships provided a generous amount of information related to more specific "accounting" internships, with most of that literature investigating the effects of internship programs on subsequent college performance. English and Koeppen (1993) cited earlier literature supporting the benefits of accounting internships, including a study by the American Accounting Association, which noted the benefits to include: broader exposure to accounting

techniques and problems not possible in the classroom, improved understanding of the business world, and the improved ability to evaluate and assimilate classroom experience. Lowe (1965) found that interns felt the internship clarified accounting theory, while Koehler (1974) asserted that internships motivate students to work hard early in their academic programs in order to secure internships and result in improved grades upon conclusion of those internships. Smith (1964) reviewed accounting education internships, citing the 1959 Council of the A.I.C.P.A.'s advice that plans be developed so that internship be well organized and supervised by schools and practitioners.

In 1964, Smith gave six reasons for the loss of interest in the academic internship: a) industry demand for graduates (permanent positions could be secured without the contact provided by internship, b) student inconvenience to move from school to work locations and back before graduation, c) the university semester plan does not complement the work environment, d) firms, for what ever reason, are less responsive to accepting undergraduate students than in earlier years, e) new educational techniques and improvements in teaching methods and materials tend to reduce the necessity for a field experience, and f) many schools have failed to name a faculty member to be responsible for supervising and generating student interest in the internship program. In order to overcome this lack of interest, it is important to clarify the elements that make up the business internship and the benefits that might be realized. Smith (1964) points out that the internship should provide students with a broad perspective of accounting practices by assigning students to a variety of jobs, projects,

activities, companies or programs. Further, the internship should be a requirement for either a bachelor or master degree, but not granted prior to completion of the junior year (1964). However, credit toward graduation for successful completion is a matter to be resolved by the respective college or university. Smith concluded that in order to have a successful program, a faculty member should be assigned the responsibility of supervising the program, conferring with students and working with practitioners and industry personnel on all matters of common interest to the intern, the employer and the college. Lowe (1965) revealed weaknesses of some programs to include: programs were too brief to be of great value, programs did not diversify activities, and results of work not viewed by interns. While supervision from the field placement company was generally complimentary, additional instruction was often needed for the supervisor. Supervision from the college was a weakness in a number of programs, with little contact with interns in the field and little control over the quality of their experience. More reflection and reactions to the program (from students, faculty and practitioners) are necessary to improve the program (Lowe, 1965).

### *Political Science*

Finding no accrediting agency associated with political science, or any standards or guidelines offered by the American Political Science Association (APSA), a brief review of literature was conducted. In research during the early 1970's in Political Science (*PS* – the professional journal of the APSA), Hirschfield and Adler (1973) point out that political science literature largely ignored questions regarding the scope, structure, and strategies of internship programs. Hedlund (1973) described how little



assistance was available in journals or books of political science dedicated to understanding how students respond to the internship experience or what can be done to maximize student learning. Until the 1970's there was no central source to coordinate the national, state and local political internship programs or their sponsors. The communication regarding internship was fragmented and haphazard. These two 1973 reports in *PS*, along with publication of the book, *Government Management Internships and Executive Development*; and a new journal, *Teaching Political Science*, plus the formation of a center for disseminating internship information, the National Center for Public Service Internship Newsletter (NCPSI), indicated a new stage in the evolution of political science concern with internships. Hedlund (1973) briefly reviewed the goals of internships and considered observations of program directors and participants, qualities of offices, qualities of the intern and educational structuring. The conclusion of the NCPSI was that only after program supporters, interns and directors undertake systematic reflection and analysis regarding internship goals and methods are internships likely to maximize their learning potential. Hennessey, (as cited by Hirschfield and Adler, 1973), gives the three critical elements required in any useful internship: a) it must be a "real work" situation, b) the student must participate on the same basis as other workers, and c) there must be systematic and continuous examination of the experience in relation to generalization of political science. Of the three components of a good internship program – student, principal and faculty member – the last is deemed the most important. The faculty member finds a field placement for the intern, informs principals of their responsibilities, makes on-site visits, and continually communicates

with the intern. The selection and training of the internship supervisor is critical to the success of the program. Hirschfield & Adler (1973), concluded that an effective internship program should include the following essential elements: a) highly motivated, professionally competent, and politically attuned faculty, b) understanding of and commitment to the educational purposes of the internship program on the part of principals, as well as faculty and students, c) well-structured and discipline-related academic input through regular seminars or class work, d) the assignment of written work so that the student can organize his perceptions of his internship experience, e) academic credit for participating so that the internship is regarded as a legitimate part of the student's curriculum, f) continuing communication among students, faculty and principals through regular meetings and newsletter distribution so that an atmosphere of common purpose is maintained, and g) adequate funding to meet the program's administrative needs and to make possible the inclusion of any students who would gain from an internship.

The APSA website provides access to, *Studying in Washington: A Guide to Academic Internships in the Nation's Capital* (Frantzich, 1977). The first as well as the next three editions, entitled *Storming Washington: An Intern's Guide to the National Government*. The guide introduces students to the objectives, procedures, and anticipated outcomes of an internship in the United States capital. Information assists faculty in advising students and informs academic administrators and students' families about why internships make a significant contribution to education and career preparation. Although this book's main focus is an overview of the city of Washington, D.C., the

advice to students about how to benefit from an internship can be adapted to internships in state and local politics and government as well.

### Allied Health Professions

The Commission on Accreditation of Allied Health Education Programs (CAAHEP) is the non-profit agency established July 1, 1994, which accredits programs representing 18 allied health professions in over 1900 allied health education programs in more than 1300 institutions. These institutions include universities and colleges, academic health centers, junior and community colleges, hospitals, clinics, blood banks, vocational-technical schools, proprietary institutions, and government institutions and agencies (CAAHEP, 2003).

CAAHEP cooperates with Committees on Accreditation sponsored by various allied health and medical specialty organizations. Each of the program accreditation standards are the minimum measures of quality to be used in accrediting programs that prepare individuals to enter the respective health care professions. Standards therefore constitute the minimum requirements to which an educational program shall be held accountable.

Although specific standards regarding structuring internship programs were not found, a commonality within the many program standards was found in their respective instructional plans. Each discipline within CAAHEP expects “that the curriculum must include an appropriate sequence of learning experiences consisting of classroom and laboratory presentations, discussions, demonstrations, and *supervised laboratory* and *clinical practice*” and “clearly written course syllabi which describe learning objectives

and competencies must be developed for each of the didactic, *laboratory*, and *supervised clinical* education components” (CAAHEP, 2003).

Curriculum requirements for health information management states that programs should provide, “Appropriate learning experiences and curriculum sequencing to develop the competencies necessary for graduation, including appropriate instructional materials, classroom presentations, discussions, demonstrations, and *professional practice experiences*.” Another requirement is, “a) There must be supervised professional practice experience designed to reinforce learning experiences. b) The instructional staff shall be responsible for assuring that the activities assigned to students in the professional practice setting are consistent with program goals and standards. c) Supervised professional practice assignments for students shall be structured to gain experiences in applying knowledge to technical procedures and in developing professional attitudes for interacting with other professionals and consumers in the healthcare field. Professional practice experiences may be included in the curriculum as separate courses, incorporated within courses, and/or developed as simulated professional practice modules. Off-campus assignments shall be in facilities, organizations, or agencies related to healthcare. The student’s education should end with a capstone experience to integrate knowledge, behaviors, and professional attitudes acquired throughout the curriculum that are necessary to the practice of health information administration (CAAHEP, 2003).

### Teacher Preparation

The National Council of Accreditation of Teacher Education (NCATE) is an agency that accredits colleges, schools, or departments of education in the United States. The U.S. Department of Education and the Council for Higher Education Accreditation recognize NCATE as a professional accrediting body for teacher preparation.

*NCATE Standards.* NCATE's Standard 3, directly addresses field experiences and clinical practice. Clinical practice is defined as either preservice student teaching or internship for administrators. The standard states, "The unit and its school partners design, implement, and evaluate field experiences and clinical practice so that teacher candidates and other school personnel develop and demonstrate the knowledge, skills, and dispositions necessary to help all students learn" (2002).

The following are excerpts from the NCATE Standard 3: Field Experiences and Clinical Practice:

*Collaboration.* The standard calls for collaboration between the "unit" (teacher preparation program) and the "triad" (university faculty, campus faculty and teacher candidate), with shared and integrated resources and expertise to support candidates' learning in field experiences and clinical practice. Both faculty are involved in designing, implementing, and evaluating the unit conceptual framework(s) and the school program; they each participate in the faculty professional development activities and instructional programs for candidates and children. The faculty jointly determine specific placements of student teachers and interns for other professional roles to maximize the learning experience for candidates and P-12 students.

*Partnering.* Field experiences allow candidates to apply and reflect on their content, professional, and pedagogical knowledge, skills and dispositions in a variety of settings with students and adults. Both field experiences and clinical practice extend the conceptual framework(s) into practice through *modeling* by clinical faculty and well-designed opportunities to learn through *doing*. During clinical

practice, candidate learning is integrated into the school program and into teaching practice. Candidates observe and are observed by others. They interact with teachers, college or university supervisors, and other interns about their practice regularly and continually. They reflect on and can justify their own practice. Candidates are members of instructional teams in the school and are active participants in professional decisions. They are involved in a variety of school-based activities directed at the improvement of teaching and learning, including the use of information technology. Candidates collect data on student learning, analyze them, reflect on their work, and develop strategies for improving learning.

*Faculty Development.* Clinical faculty are accomplished school professionals who are jointly selected by the unit and partnering schools. Clinical faculty include both school and higher education faculty responsible for the field experience or internship. Clinical faculty are selected and prepared for their roles as mentors and supervisors and demonstrate the skills, knowledge, and dispositions of highly accomplished school professionals.

*Candidate Development.* Entry and exit criteria exist for candidates in clinical practice. Assessments used in clinical practice are linked to candidate competencies delineated in professional, state, and institutional standards. Multiple assessment strategies are used to evaluate candidates' performance and effect on student learning. Candidates, school faculty, and college or university faculty jointly conduct assessments of candidate performance throughout clinical practice. Both field experiences and clinical practice allow time for reflection and include feedback from peers and clinical faculty. Field experience and clinical practice provide opportunities for candidates to develop and demonstrate knowledge, skills, and dispositions for helping *all* students learn. All candidates participate in field experiences or clinical practice that include students with exceptionalities and students from diverse ethnic, racial, gender, and socioeconomic groups.

*ATE Standards.* Additional standards reviewed in the area of Teacher Preparation include the Association of Teacher Educators (ATE), *Standards for Field Experiences in Teacher Education* (2000). The Association of Teacher Educators, founded in 1920, is an individual membership organization devoted solely to the improvement of teacher

education both for school-based and post secondary teacher educators. ATE members represent over 700 colleges and universities, over 500 major school systems, and the majority of state departments of education. In addition, ATE has representatives on the National Council for Accreditation of Teacher Education (NCATE), the Holmes Partnership (for Professional Development Schools), and the Educational Research Information Clearinghouse (ERIC) on Teacher Education. The recent development of new "National Standards for Field Experiences in Teacher Education" was completed in collaboration with the executive board of ATE. Standards developed by the ATE correspond with, complement, and extend the NCATE standards.

The *ATE Standards for Field Experience in Teacher Education* (2000), include twelve standards: 1) collaboration of universities and schools with a commitment to simultaneous review and reform; 2) assessment of the internship program; 3) selection, preparation and assignment of university faculty; 4) selection, preparation and assignment of cooperating faculty; 5) the roles of the triad – candidate, cooperating school supervisor, and university supervisor; 6) feedback to candidates – verbal and written based on agreed upon outcomes by university and school supervisors; 7) continuous communication and interaction through on-site observation, cross-site interactions, and use of communications technology; 8) opportunities for ongoing reflection on and analysis of teaching and learning, school conditions, and candidate development; 9) context and sequence of the field experience; 10) school contexts provide supportive environments; 11) diverse student populations and diverse settings;

and 12) adequate resources (expertise and financial) for administration and implementation.

The following are excerpts from the *ATE Standards for Field Experiences in Teacher Education*, providing the elements necessary for a successful field experience:

1. University/School Collaboration with commitment to simultaneous review and reform -- the goals and mission of the teacher preparation program and the goals and processes of the field experiences are developed and agreed upon collaboratively by the university and cooperating teacher educators and administrators.
2. Assessment of the Internship Program – uses a model of assessment that addresses realistic goals and objectives and promotes high expectations. Assessment is ongoing and used for program improvement. The program model is developed by those involved in the field experience (triad) regarding the following areas: context or setting, placement process, collaborative fostering, professionalism, program goals, candidate outcomes, benefits to students, resources, rewards and accountability, and compliance with state and local policies/practices.
3. Selection, preparation and assignment of university faculty – is systematic, collaborative, and based on the agreed upon internship program framework.
4. Selection, preparation, and assignment of cooperating faculty – is systematic, collaborative, and based on the agreed upon internship program framework.
5. The focus of the roles of the triad – candidate, school supervisor, and university supervisor. All field experience participants demonstrate pedagogical and content knowledge, skills and dispositions that are congruent with teacher education program outcomes. Field experiences are aligned to meet program and/or national standards.
6. Feedback to candidates – verbal and written formative and summative feedback regarding progress demonstrating professional learning in relation to explicitly stated program outcomes agreed upon by university and school supervisors. Multiple assessment procedures include professional portfolios, self-assessment and peer-assessment.



7. Continuous communication and interaction through on-site observation, cross-site interactions, and use of communications technology – the triad communicates with each other in some way at least once a week. Quality interactions facilitate a professional learning community and decrease communication problems. Candidates demonstrate increased self-confidence and skills in communication.
8. Opportunities for ongoing reflection on and analysis of teaching and learning, school conditions, and candidate development – reflection tools include journals and portfolios.
9. Context and sequence of the field experience – the triad unit hold compatible views and philosophies about teaching and learning, with varied field experiences designed to meet varied and sequential goals of the teacher education program. Field experiences are sequential and cumulative and based on models of professional development. Placements meet goals of the teacher education program and are sequenced to meet the developmental needs of the teacher candidate.
10. School contexts provide supportive environments – teacher candidates feel comfortable in the schools in which they are placed. Administrators, teachers, students, and parents in the school setting want and support teacher candidates. Candidates participate in the life of the school as member of a learning community.
11. Diverse student populations and diverse settings – extended field experiences with diverse school populations include students of different age levels, diverse racial and ethnic groups, diverse socio-economic backgrounds and diverse special needs. The internship program provides diverse placements in schools with diverse administrative, curricular, and structural features. Candidates have opportunities to work with different students in different school structures.
12. Adequate resources (expertise and financial) for administration and implementation – both university and school resources are necessary. Administration of the field experience is a shared expense. Personnel are designated and compensated for handling logistical responsibilities of the program including: candidate clearance; procurement and placement of candidates; development of field experience guidelines, handbooks, etc.; arranging seminars and

meetings; and developing and implementing assessment and research procedures.

Because an extensive review of literature was included in the preparation of the NCATE and ATE standards for teacher education field experiences, an additional review of literature concerning teacher education internship was not necessary.

### Construction Education

In order to *compare* the above four domain areas with construction education, and because accrediting agencies concerned with construction education provided little or no guidance in the development or structure of internship programs, it was necessary to review literature regarding construction education internships. An analysis of construction education literature follows.

Senior (1997) reported the need for an internship as part of the construction curriculum to be almost universally supported by ASC faculty across the country. The level of intervention, however, was found to be quite different among colleges. Some programs like Purdue University's Construction Engineering and Management, require the internship component of the curriculum. Purdue's full-time internship director, recruits sponsors and is the liaison between them and their interns. Other programs are minimalist in approach to internships. These programs allow the campus Coop program to administer the internship. Students are responsible for contacting sponsors. The number of interns hired and their work conditions are organized at the discretion of the sponsors.

According to Adcox (2000), the internship experience is generally the most important single part of a construction management student's professional preparation. Internships should be a competency-based program with pre-stated instructional goals and outcome performance behaviors designed to specifically represent the competencies necessary for the construction manager to function efficiently. Adcox (2000) posits that the internship experience is conceptualized as a partnership between construction industry work sites and the university's academic environment. Each partner brings a special and necessary area of expertise to the partnership, thus enabling on-site directing managers to assist and direct the construction management student to progress from novice to productive construction manager.

Marshall (1999) provided a rationale for implementing a required professional internship and presented the typical elements of an internship portfolio, and examined the crucial role of the professional internship coordinator. Marshall stated that the benefit of a well designed and carefully structured internship would not only provide job placement for graduates, but is also a recruiting tool for potential students with a desire to upgrade their skill sets. The internship partnership also affords opportunities for equipment donation, scholarships, faculty sabbaticals and is a source of members for advisory boards. Marshall (1999) reported that internship provides an opportunity for the student to link theory to practice and to reflect on situations outside the classroom where problems are real, solutions are complex, and individualized challenges are possible. Upper class standing is important to optimize the internship experience. Securing employment is the student's responsibility. Portfolio assessment is recommended with

typical elements including: student resume, company organization chart with mission statement or goals, student performance goals, daily logs, self-evaluation with reflection, and a final written evaluative report. Marshall reported that the hosting firm plays a vital role toward the success of the internship program by the assignment of intern's professional responsibilities and providing the industry supervisor for guidance. The student is expected to be exposed to various aspects within the company and will be paid at a level agreed upon, while no permanent employment is being offered. The intern's industry supervisor also completes intern performance evaluations. According to Marshall (1999), the university coordinator's role involves recruitment, administration, guidance, coordination, and a great deal of quality control. The coordinator must be readily available to assist the student or the hosting firm. The communication process between the "triad" – student, hosting firm and university coordinator, must occur prior to and continuously throughout the experience. The coordinator is the established liaison with the industry, maintains the historical relationship, and insures the quality and consistency of the program. The university coordinator conducts site visitations and develops a written evaluation of the intern.

The answer to the question, "Can construction education enhance its internship program by utilizing guidelines and standards for field experiences from other domain areas such as business, political science, medicine, or education?" is, not from accreditation standards alone. Construction education can however gain some insight for structuring internship programs by reviewing literature in each domain area, and placing

the data collected into a structured matrix (see Appendix D), revealing the key components shared by the different domains areas of interest.

### **Findings of the Pilot Study**

Although the standards from teacher education were found to be the only domain area that specifically define and specify the development or structure of an internship program and its continued improvement, the analysis of the standards along with a review of literature in each domain area, provided data for placement in a structured matrix (see Appendix D). This matrix provides for the comparison of program variables of the four domain areas with construction education.

It was interesting to find that all domain areas except political science have accreditation agencies associated with their discipline. In construction education, not one of its three governing accreditation agencies was found to address in their standards the structuring of field experience or internship. The allied health professions, on the other hand, set standards for each and every specific discipline within their domain. Teacher preparation was the only domain area to write formal standards addressing the structure, development and continued improvement of field experiences and internships.

When comparing across domains whether internship is “required” for graduation, only teacher preparation and the allied health professions make internship a requirement. Within construction education, the ACCE makes internship mandatory for program accreditation, but does not provide any guidance for the structure or development of that internship experience.

Across domains, all were found to have certification exams or licensure (except political science), with the allied health professions having a board of examiners overseeing each separate discipline. Interestingly, only the allied health professions require these examinations for college graduation. The allied health professions programs also require these examinations for employment. Teacher education programs do not require the examinations for employment, but typically states require the exam for teacher certification. Teacher Education programs organize their programs to respond to state program requirements and in order for graduates to pass the state teacher certification examination. Alternative teacher certification does exist and programs vary among states. However, alternative certification programs include some measure of supervised field experience (U. S. Department of Education, 2002).

Paid internships are allowed and are considered the “norm” in business, political science, and construction education, while internships in the allied health professions and teacher preparation are not paid.

Collaboration between university programs and their respective industries are found in all domain areas with more formal partnerships in the allied health professions and teacher preparation. Construction education has shown increased interest in collaboration and partnering.

While placement of students in specific internships is not typically provided by construction education, allied health professions and teacher preparation have provided placement for students.

While all domain areas, including construction education, provide for specifically selected university faculty supervisors to administer their respective internship programs, construction education does not select the cooperating industry supervisors nor do they provide any special training for those supervisors.

University supervisor site visitations are not mandatory across all domains (except teacher preparation).

Evaluation and deliverables across all domains vary. Evaluation and deliverables for the construction internship experience vary as greatly as the many different names of their programs. On one end of the spectrum, some programs require the majority of the following deliverables: self evaluation, university supervisor evaluation, cooperating industry supervisor evaluation, written reports, daily logs, portfolios and written reflections or perceptions. While on the other end of the spectrum, a minimal account of the whole experience may be required in one short written report.

Course credit for the internship was found to influence the amount of evaluation and deliverables required for the internship experience across all domains.

Although an industry advisory council was found to be required for only the allied health professions and teacher preparation, all domains showed evidence that these councils are being considered to improve university program and related industry relationships.

All domain area literature revealed an interest in collaboration between the university and the triad members, and collaboration on the internship structure and

improvement. Across all domains, continuous communication between the triad members was considered important.

Construction education does not choose the work context for its students, nor does it formally promote work in “diverse populations”. The construction education literature suggests that construction by its very nature is diverse and therefore provides a diverse working environment. On the other hand, the other domain areas promote work in diverse populations, and the allied health professions and teacher preparation programs have often chosen the context for their students. All domains suggest that a diverse work environment is important for the student’s education.

All domain areas consider the appropriate sequencing of the internship to occur in the upper-level years of a student’s education. Construction education literature suggests that the experiential component being implemented in the Junior year helps the student to clarify career choices, direct subsequent coursework interests, and integrate classroom knowledge with real world work experiences.

Across domain areas, not all literature suggested that internship administration be adequately funded.

When comparing the length or duration of the internship field experiences across domains, considerable variation was found. In business, political science and construction education the length of an internship varied from none, to one summer session, to two summer sessions, up to one long semester. Political science additionally allowed one- and two-month internships while students were concurrently enrolled full-



time students. Only allied health professions and teacher preparation required long semester internships.

### **Conclusions of the Pilot Study**

The pilot study investigation analyzed and compared standards and guidelines for internships or field experiences in undergraduate university domain areas of: business, political science, allied health professions, teacher preparation, with construction education. The standards from teacher education were found to be the only domain area that specifically define and specify the development or structure of an internship program and its continued improvement. An analysis of the standards, along with a review of literature, provided the data for placement in the structured matrix (see Appendix D). Figure 1 revealed the key components shared by the different domains of interest.

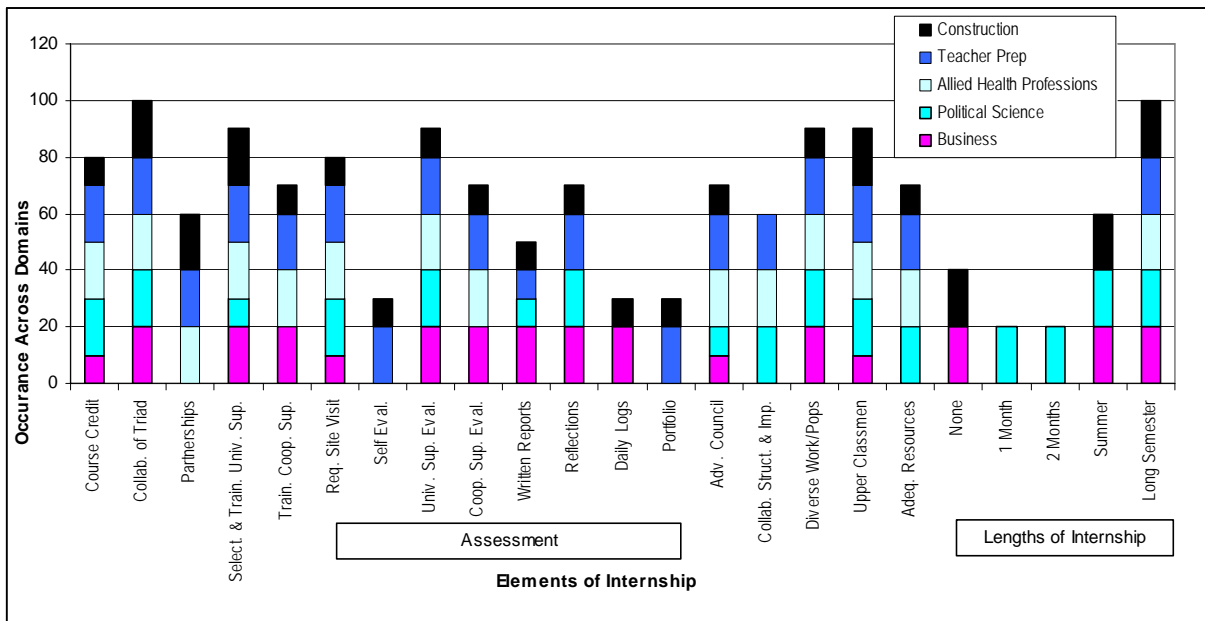


Figure 1. Key elements of internship shared across domains.

Although the many issues that the teacher education field experience standards address are essential in a teacher preparation program, it is unlikely that construction education programs or the pragmatic hosting firms will see the necessity to consider *all* the issues addressed.

While the information revealed in Figure 1 provided a list of key components for utilization in a construction education internship program, it was concluded that additional research was necessary before a set of “best-practices” guidelines could be suggested.

The pilot study concluded that more important than arguing for just one model to enhance construction education internship programs, the construction education discipline needed to research in depth, internship programs currently being implemented at the undergraduate university level. And, because the interactions of the “triad”

(student, university faculty supervisor and industry supervisor) were found to be important in developing and structuring internship programs, research concerning the triad's perceptions regarding internship needed to be conducted.

As a result of the conclusions from the pilot study, the surveys of schools, students and construction companies were conducted.

### **Summary**

After careful consideration of the previous extensive literature regarding internship, it has been established that internship is considered to be a valuable experiential learning component in many educational disciplines. Studies have shown the effects of internship on subsequent coursework; studies have described the benefits of internship for students, industry and academia; studies have examined the perceptions of students, companies and universities regarding internship; literature has described the status of internship, experiential or cooperative learning experiences; and the literature has suggested ways to structure or develop guidelines for implementing an internship program.

Although construction education literature has recently described the extent of cooperative education (included internship) as a recognized segment of the various construction education curriculums, there has been no attempt to provide construction education programs with a set of standards or "best-practices" guidelines concerning the development and implementation of a formal structured internship program in construction education.

## CHAPTER III

### METHOD

#### **Introduction**

This chapter includes in detail the procedures followed in the execution of the study. The chapter is divided into five sections. The first section includes the research methodology. The second section includes the specific projected treatment of each objective. The third section includes description of participants, materials and procedures. The fourth section includes information regarding criteria for coding data. Finally, the fifth section includes information regarding the reliability and validity of the study.

#### **Research Methodology**

Because the role of research in the field of construction education is in its infancy, information that describes a situation or makes others aware of an observance is a necessary and important step before hypotheses can be addressed and tested. Descriptive studies describe, “what is”. Descriptive studies include Assessment, Evaluation and Descriptive Research (Ex-Post Facto). This study utilized the survey method to acquire data from three sources: university undergraduate construction education programs, construction companies, and students of the respective schools. The three survey instruments were divided into two parts. Part One questions collected data for Objective One, and Part Two questions collected data for Objective Two.

## **The Specific Projected Treatment of Each Subproblem**

### **Subproblem One**

The first objective of this study was to describe construction internship programs in selected American universities reporting distinct characteristics that vary between programs.

The first part of this study was conducted as a descriptive assessment study that described the current situation of undergraduate university construction education programs within the United States. The study design was an on-line survey, where participating construction education program representatives voluntarily accessed a secure database hosted by Texas A&M University, and answered questions regarding their respective internship programs. This study was conducted at Texas A&M University, College Station, Texas starting fall of 2003. The School Survey was conducted fall 2003, the Company Survey was conducted spring 2004, and the Student Survey was conducted spring 2004, summer 2004, and fall 2004.

Utilizing the membership roster of the Associated Schools of Construction (ASC), 92 construction education programs were asked to participate in the SCHOOL SURVEY and to provide information describing their internship program being implemented at the present time. One contact representative from each university was e-mailed a recruitment letter asking for voluntary participation in this research survey. The e-mail contained a URL address, along with a username and password that provided access to the internet-based survey; and a Letter of Consent (a study information sheet with all elements of consent, sent as an attachment to be downloaded and stored by the

participant (see Appendix C). All voluntary participants were included in the study provided the questionnaire was completed and submitted for final insertion into the construction education school survey database. Although the study population had the expected disproportionate representation of one gender, it is the “program” that was of interest, not the respondent.

One of the assumptions of this study was that all participating construction education programs would have the technological capability (compatible browser interface software) to access the on-line internet-based website. When it became evident that many of the university participants were unable to access the on-line database, an e-mail version of the school survey was prepared and provided. The e-mail version of the school survey was constructed with identical questions and identical appearance to the on-line survey. An additional paper-based printed version was also constructed with identical questions to the on-line survey and provided to those participants unable to participate in any other way (see Appendix B). The responses of school participants that replied to the e-mail and paper-based survey instruments were entered into the school survey database by the investigator.

By using a list of the top 400 constructions companies in the U.S., taken from the 2003 Engineering News Record Special Report, 200 paper-based survey instruments were mailed with self-addressed, return postage paid envelopes in January, 2004 (see Appendix B). Green, Chuchinprakarn, and Seshardi (2000), as cited by Knemeyer and Murphy (2001), posited that mail surveys are considered an essential tool for industrial researchers to gather information from busy executives. Jobber and O’Reilly (1996), as

cited by Knemeyer and Murphy (2001), stated that the mail survey permits the internship providers to consult documents and complete questionnaires in their own time. In addition, answers may be more honest than when face-to-face with an interviewer. “While the method is unlikely to capture all the intricacies and nuances that may occur within specific internship experiences, it can provide sufficient access to address straightforward and concise questions.” (Knemeyer and Murphy, 2001, p. 2). Each participant was provided with a study information sheet with all the elements of consent and asked to keep the document for their records (see Appendix C).

Because the Institutional Review Board (IRB) required the voluntary recruitment of students, a recruitment flyer was sent to each of the ASC schools. But, because any student could respond to the posted flyer at each of the ASC schools, there would have been no control as to whether a respondent actually participated in a construction education internship program prior to participation in this study or that they were actually construction education students. Additionally, there was great difficulty in recruiting students to voluntarily respond *at all* from a posted advertisement. As an alternative, internship information acquired from part one of the school survey was utilized to gain voluntary participation of only appropriate students. Each of the ASC construction education programs was asked these two questions in their school survey: 1) would they provide a list of students for participation in the student survey?, and 2) would they encourage participation in a student survey? From positive responses to these two questions, the appropriate schools were contacted and asked to “forward” a recruitment e-mail to their students who had recently participated in an internship

program (spring 2004, summer 2004, or fall 2004). By recruiting in this way, only students who had recently participated in an internship were allowed to voluntarily reply to the e-mail student survey instrument. Each participant was provided with a study information sheet with all the elements of consent and asked to download and keep for their records.

Variables of interest included, but were not limited to, program length, type of supervision, amount of academic deliverables, and whether the internship was paid or unpaid. (See Appendix A for sample survey questions for: School Survey, Company Survey and Student Survey). This assessment study described the status of a phenomenon at a particular time. No value judgments or attempts to explain underlying reasons are made for this part of the study.

This part of the study was a descriptive evaluative study. Through the use of on-line, e-mail and paper-based survey instruments, Part One of the survey instruments (School Survey, Company Survey and Student Survey) collected participant information that helped describe the university internship programs being implemented, from the three different perspectives. Participant information was not used in any identifying way. Participant information about companies was utilized to stratify respondents by “Type” of business performed and the “Size” of company (see Appendix B).

### **Subproblem Two**

The second objective of this study was to identify elements that students, employers, and faculty perceived to support a valuable, satisfactory internship experience.



Part Two of the survey instruments identified elements that 1) students, 2) employers or construction companies, and 3) school programs perceived to be valuable to an internship experience by rating the degree in which they agreed or disagreed with 14 statements pertaining to the internship experience. Through the use of a Likert scale, participants rated the degree that each agreed or disagreed with certain aspects of the internship experience through pre-determined statements. Statements rate the degree to which internships may be valued in a number of ways by all three participant groups. Statements rated the degree to which internships may be used as pre-hire investigations by companies and students. Participants also rated whether internships provided insight into a student's abilities; whether internships provide increased self-esteem or confidence in students; how student performance may be perceived to represent the strengths or weaknesses of a school program; how internships may help students in subsequent academic performance; and how internships may help clarify career choices. Other statements asked if the deliverables of the internship fairly represent the work accomplished; if the school provided enough guidance to the student and the company; and whether the length of the internship was appropriate. Additionally, participants were asked if the interaction of students and professionals was valuable to the respondent. Lastly, an open-ended response question asked participants to list other qualities that each deemed to be valuable in an internship (see Appendix B).

One way evaluation studies are used is to determine if a given program is working or successful according to goals or specified criteria; and gives value judgment of social utility, desirability, and the effectiveness of a process, product or program.

From this descriptive evaluative study, recommendations to encourage satisfying, successful undergraduate university construction education internship programs throughout the United States can be reported. The use of univariate analyses, revealed the elements that the students, employers or supervisors, and faculty each perceived to result in a positive internship experience.

### **Subproblem Three**

The third objective was to develop a set of “best-practices” guidelines or standards that will provide construction education programs with a structure for developing their construction education internship programs. Through the integration of the investigated standards and guidelines from The Pilot Study, along with the information gathered concerning currently implemented construction education internship programs in Subproblem One, and the perceptions of the triad members revealed in Subproblem Two, a structure can be identified in order to develop a set of “best-practices” guidelines or standards for the construction education discipline in Objective Three.

### **Participants, Materials and Procedures**

In describing the School Survey population, out of the 92 schools in the original list of ASC Schools (Associated Schools of Construction), one school was excluded from the population because the school only provides a graduate degree and one school was excluded because they reported that they only had a two-year program. Of the 90 schools, 60 schools responded to this study (66.7%). Of these 60 schools, four

participants were unable to successfully access the internet-based survey, nor responded to the other methods of survey, and therefore did not participate. To gain additional participation, the alternate e-mail version of the survey instrument was sent a second time, with nine (9) schools responding; and finally a paper-based version was mailed, with twenty (20) schools responding. In the end, 54 schools completed survey instruments (59%); two participants e-mailed this investigator saying they wanted to be included in the study as responding that “they do not require, nor encourage a formal internship in their programs”; with the final study being based on 56 responses or a response rate of 62 percent.

In describing the Company Survey population, of the 200 paper-based survey instruments mailed to a random sampling of the top 400 construction companies in the United States, listed in the Engineering News Record Special Edition 2003, 75 companies participated in this study. The response rate of the Company Survey was 37.5 percent. The paper-based survey instrument was developed to appear identically with the on-line version and the e-mail version sent to the other populations of interest in this study. In conducting the random sampling, the list was relatively short (400), it included a comprehensive alphabetical listing of the companies, each complete with the name of the President or CEO, a viable address, and a phone number. The list was then assigned numbers from 001 to 400. A random number generator was utilized to produce 200 different numbers. The individual companies corresponding to the 200 numbers were sent surveys. All 75 participant companies were located within the United States. The 75 participant companies characterized themselves under five different “Types” of

construction including: Commercial; Heavy Highway/Civil; Industrial/Power; Construction Management/Engineering/Design Build; and, Miscellaneous (Residential, Multi-family, other). The 75 participant companies were classified into four categories for “Size” of company including: Small, Medium, Large and Undisclosed. With Small being less than \$200 Million; Medium being \$200 Million to \$500 Million; Large being \$500+ Million; and last, Undisclosed size, but still of interest.

In describing the Student Survey population, the recruitment of students was an arduous process. The information provided by construction education programs in the School Survey - Part One was utilized to acquire participation of students that had participated in a spring 2004, summer 2004 or fall 2004 construction internship program. The thirteen (13) schools that answered “Yes” to the question: “Can you provide a list of students that participated in any of the previous sessions of internship?” were contacted and asked if they would provide a list of students that had recently participated in an internship program. After the great disappointment of resoundingly being told “No”, recommendations on how to acquire the necessary student participants were requested. Many of the school contacts said that they would look over an e-mail version of the Student Survey, and upon approval, would then “Forward” the e-mail survey to their list of recent interns. In that regard, only students wishing to voluntarily participate in the study would reply to the e-mail survey instrument. Again, disappointed with the lack of participants, this investigator utilized the School Survey -Part One again to identify additional schools that answered “Yes” to the question: “Will you encourage students to participate in a student survey concerning the internship experience?” Survey

instruments were e-mailed to the additional twenty-two (22) schools. The Student Survey instruments were then “forwarded” to the eligible students. Students then responded to the survey instrument by voluntarily sending it back to be included in the study. The Student Survey population can be described as 31 voluntary participants from 11 different schools in nine different states. All 31 participants were students in four-year universities located within the United States. All 31 participants were undergraduate students enrolled in construction education programs. The 31 participants listed their degree as a Bachelor of Science in either Construction Management or a Bachelor of Science in Industrial Technology with emphasis in Construction. All 31 participants responded that they had participated in a construction related internship.

### **Criteria for Coding Data**

Once data have been collected by a survey, no matter what the methods, they must be translated into a form appropriate for analysis by computer. This section describes the process of taking the completed questionnaires and putting them into a form that could be read and processed by a computer. The process of coding involved five separate phases: 1) formatting or organizing the data, 2) designing the code (the rules by which a respondent’s answers were assigned values to be processed, 3) coding (the process of turning the responses into standard categories, 4) data entry (keying in the data into a database or spreadsheet so the analytical software can read them, and, finally 5) data cleaning (doing a final check on the data file for accuracy, completeness, and consistency prior to the onset of analysis).

### **The Validity and Reliability of the Study**

In assessing this study, it was important to look at external and internal validity and reliability. External validity is concerned with the applicability of the conclusions to other situations. The external validity of the study was dependent on the number of programs surveyed and the number of programs, students and companies that actually participated. An appropriate sized, representational sample had to be acquired in order to make generalizations to the target population (all university undergraduate construction education programs within the United States) from the study population (the ASC undergraduate university construction education programs). When sampled correctly, the external validity can be good. The study can provide insight for all undergraduate university construction education programs within the United States. It must be noted though that the survey was conducted at one particular period in time and may not generalize to a different period of time. Current events, economic conditions and supply and demand of students may have an affect on the external validity of this study. One way that this could be countered is by gathering the same data at a different time and comparing the results to the first study.

Internal validity is freedom from bias in forming conclusions in view of the data. Each survey instrument in this study had two parts. In part one, only factual information that describes internship experiences was sought. In order to increase validity of factual reporting: only questions that the respondent was likely to know the answer to were asked. The method of survey allowed respondents time to gather necessary information. Only questions that the respondent “wanted” to answer were asked (no controversial or

incriminating questions). And lastly, respondents were reassured that their participation would be kept confidential. Part two of each questionnaire, asked for perceptions of participants (students, faculty and supervisors). Each constituent may have different ideas of a satisfactory internship and may be influenced by many different extraneous conditions, such as current events, economic conditions of the industry, or supply and demand of students, etc. Three ways to improve validity of subjective questions were employed: 1) questions were made as reliable as possible with no ambiguity, with a standardized presentation, having the same meaning to all respondents; 2) when putting people into categories or ordered classes, a long continuum (more categories) was considered better (the validity of measure increases to the extent that real variation among respondents is measured); and 3) multiple questions with different question forms (that measure the same subjective state) were asked. The use of Agree-Disagree Likert scales are meaningful if used as they are supposed to be; to order people or data. Because the use of agree-disagree questions have two main potential limits: the statements must be located at the end of a continuum in order for the answers to be interpretable; and the statements cannot be multi-dimensional or double-barreled (no “and” in the statement).

Because part one is only a descriptive assessment study describing internship programs, there should be no problem with sampling error. It should not be necessary to survey all construction education programs, all students, or all construction companies. One contact person per ASC School provided sufficient information concerning

university undergraduate construction education programs, and identified elements that made the internship valuable to academia.

By using a list of the top 400 construction companies in the U.S., taken from the 2003 Special Report of Engineering News Record, 200 paper-based survey instruments were mailed with return postage paid envelopes. While the method is unlikely to capture all the intricacies and nuances that may occur within specific internship experiences, it provided sufficient perceptions for this study. Stratification of the sample was used to minimize sampling error. This method was used to obtain a greater degree of representativeness, and thus decreased probable sampling error. The interest was in determining whether responses differed by size of company (large, medium, small and undisclosed); and whether responses differed by type of construction (commercial, heavy highway, industrial, and CM/engineering/design build).

Sampling error can be reduced by two factors in the sample design: 1) a larger sample produces a smaller sampling error than a small sample, and 2) a homogeneous population produces samples with smaller sampling errors than does heterogeneous populations (Dillman, 2000). Response rate is the measure of success in persuading sample members to participate. Overall response rate is one guide to the representativeness of the sample response. A high response rate results in less chance of significant bias than a low rate. A response rate of at least 50% is generally considered adequate for analysis and reporting, with 60% considered good, and 70% or more being very good (Dillman, 2000). When the response rate was insufficient for analysis, then



an additional method of recruitment was utilized such as telephone recruitment or a mail survey.

The reliability of part one of the surveys describing internship programs was good because the data was easily collectible, unbiased, quantifiable data. Part two of the survey instruments was carefully constructed to collect the pertinent data of interest. Efforts were made to assess the presence of ambiguous or confusing questions. Additionally, formatting of text, page layout and the ordering of questions were important to measurement error. Ample white space and pleasing color were employed in the instruments. The questionnaire length was also important to whether a respondent actually finished and returned the instrument. Instructions contained clear and concise language, telling the respondent how to indicate their answers, such as checking radio buttons or check boxes; and whether one or more responses were accepted or if a fill-in the blank answer was expected.

A number of techniques are available for measuring reliability of questionnaire items, but the methods for *maximizing* reliability are straightforward. Ask only questions that respondents are likely to know the answers to, ask about things that are relevant to them, and be clear in what you are asking (Babbie, 1990). The survey instruments for part one and two were carefully constructed to collect the pertinent data required. In order for this study to be reliable, every effort was made to minimize the following types of errors include sampling error, measurement error, coverage error and non-response error. According to Best & Kahn (1993), reliability of the instrument can be increased by the careful construction of questions, the use of different kinds of

questions in the instrument, and the ordering of the questions. Both restricted (closed-form) questions and unrestricted (open-form) questions were utilized in the questionnaires. In constructing the questions, particular attention to detail was taken to ensure that terms could not be misinterpreted, double negatives were discouraged, unwanted assumptions were avoided, and systematic quantification of the responses was provided. Even though in part two of the instruments, responses were more qualitative and yield data that are not always readily quantifiable, an attempt was made to improve the reliability.

To address the systematic quantification of the responses, all responses to the on-line questionnaires were entered directly by participants into a secure database hosted by Texas A&M University. Therefore there were no problems with data being entered incorrectly by the researcher. On the other hand, the e-mail surveys were retrieved, printed in hard copy and then coded and entered into the appropriate databases. The paper-based surveys were also coded and entered into the respective databases (school, student or company). The practice of data cleaning was employed to provide a final check of data file accuracy, completeness and consistency before the onset of analysis. The unbiased, coded responses were then analyzed using appropriate statistical software. Appropriate statistical analyses of the data were performed for each part of the questionnaires.

In Part Two of the School Survey, Student Survey and Company Survey, respondents were presented with statements in the questionnaire instruments; and asked to indicate the degree to which they “strongly disagree”, “disagree”, are “neutral”,

“agree” or “strongly agree” with each statement. Identical response categories were used for all three participant groups, in order to measure the given variables in a uniform manner. The five response categories were given the score of: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The Likert method was used for an *item analysis* resulting in the selection of the best items.

Univariate analyses on the distribution of cases on only one variable at a time were conducted. The findings are reported by individual listing of each variable under study. Univariate analysis served the purpose of describing the survey sample, and by extension, the population from which the sample was selected. The data were analyzed utilizing frequency percentages and summary averages including: mode – the most frequent attribute, either grouped or ungrouped; and the mean. Each variable of interest was included in this study, with the results or findings presented.

## CHAPTER IV

### RESULTS

#### **Restatement of the Objectives**

The first objective of this study was to describe construction internship programs in selected American universities reporting distinct characteristics that vary between programs.

The second objective of this study was to identify elements that students, employers, and faculty perceived to support a valuable, satisfactory internship experience.

The third objective of this study incorporated the findings from the first and second objectives to identify those common elements that provide construction education programs with a structure for their construction internship programs. From these identified common elements, a set of “best-practices” guidelines, or standards were developed for internships in the construction discipline.

#### **Subproblem One**

The purpose of this study of construction education programs was to describe the internship programs currently administered in selected U.S. university undergraduate construction education programs, reporting distinct characteristics that vary between programs.

### **Response Rate of the Survey**

When describing the response rate of the entire study; schools, students and companies were described together to give an overall idea of the importance each placed on internship or the experiential component. While the school survey presented an incredible 62% response rate, the company survey generated a response rate of 37.5%, and only 31 students “total” responded to the student survey. While the school and company response rates were excellent, the student response rate was disappointing.

### **The Study Population**

#### *School Survey*

In describing the school survey population, of the 92 schools in the original e-mail list of Associated Schools of Construction (ASC) Schools, one school was excluded from the population because the school only provided a graduate degree and one school was excluded because the school only provided a two-year program. Of these 90 schools, 60 schools responded to this investigator (66.7%). Of these 60 schools, four participants were unable to access the internet-based survey, nor responded to the other methods of survey, and therefore did not participate. To gain additional participation, an alternate e-mail version of the survey instrument was sent, with nine schools responding; and finally a paper-based version was mailed, with twenty schools responding. In the end, 54 schools completed survey instruments (60%); two participants e-mailed this investigator saying they wanted to be included in the study as responding that they do not require, nor encourage a formal internship in their programs; one respondent simply

stated, “I do not complete surveys that can be traced to my name”; with the final study being based on 56 responses. This generated a response rate of 62%.

School participant information included:

- All 56 participant schools are located within the United States.
- All 56 participant schools have four-year undergraduate construction education programs.
- The 56 participant schools are classified under approximately 29 different names for college or school affiliations.
- The 56 participant schools listed 19 different terms when asked for program emphasis. These terms have been categorized into the following 6 groups:  
25/56 (45%) said emphasis is Construction Management.

9/56 (16%) said emphasis is Civil Engineering or Construction Engineering

4/56 (7%) said emphasis is Building Construction or Building Science

4/56 (7%) said emphasis is Commercial Construction or plain Construction

5/56 (9%) said emphasis is Construction Science, Technology or Industrial

Technology or Construction Management Technology

9/56 (16%) did not fit in any other category, confused by the question or did not respond.

#### Company Survey

In describing the Company Survey population, of the 200 paper-based survey instruments mailed to a random sampling of the top 400 construction companies in the United States, listed in the Engineering News Record Special Edition 2003, 75

companies participated in this study. The response rate of the Company Survey was 37.5 percent. The paper-based survey instrument was developed to appear identically with the on-line version and the e-mail version sent to the other populations of interest in this study.

Company participant information included:

- All 75 participant companies reported that they are located within the United States.
- The 75 participant companies characterized themselves under five different “Types” of construction including: Commercial; Heavy Highway/Civil; Industrial/Power; CM/Engineering/Design Build; and, Miscellaneous (Residential, Multi-family, other).

27/75 (36%) Commercial

16/75 (21%) Heavy Highway / Civil

14/75 (19%) Industrial / Power

10/75 (13%) Construction Management / Engineering / Design Build

8/75 (11%) Miscellaneous (Residential, Multi-Family, Other)

- The 75 participant companies are classified into four categories for “Size” of company including: Small, Medium, Large and Undisclosed.

24/75 (32%) Small – Less than \$200 Million

24/75 (32%) Medium – \$200 Million to \$500 Million

15/75 (20%) Large – \$500+ Million

12/75 (16%) Undisclosed Size (but still of interest)

### Student Survey

In describing the student survey population, although there were only 31 student participants, they did come from eleven schools in nine different states. Seven of these schools reported that they would provide a list of students for participation. If they had in fact provided the list, it would have generated a possibility of 369 student participants. An additional four schools reported that they would encourage participation. The students they reported participating in an internship would have provided the possibility of an additional 112 participants. The 31 students out of the possible 481, generated a disappointing response rate of 6.4%.

From part one of the School Survey, the thirteen (13) schools that answered “Yes” to the question: “Can you provide a list of students that participated in any of the previous sessions of internship?” were contacted and asked if they would provide a list of students that had recently participated in an internship program. After the great disappointment of resoundingly being told “No”, recommendations on how to acquire the necessary student participants were requested. Many of the school contacts said that they would look over an e-mail version of the Student Survey, and upon approval, would then “Forward” the e-mail survey to their list of recent interns. In that regard, only students wishing to voluntarily participate in the study would reply to the e-mail survey instrument.

Again, disappointed with the lack of results, this investigator utilized the School Survey -Part One again to identify additional schools that answered “Yes” to the



question: “Will you encourage students to participate in a student survey concerning the internship experience?”

The e-mail student survey instrument was sent to these additional twenty-two (22) schools. After all methods of recruiting student respondents were exhausted, this part of the study generated the 31 student respondents.

Student survey participant information included:

The student survey population can be described as 31 voluntary participants from 11 different schools, from nine different states across the United States.

- All 31 participants are students in four-year universities or colleges located within the United States.
- All 31 participants are undergraduate students of construction education programs.
- The 31 participants listed their degree as a Bachelor of Science in either Construction Management or a Bachelor of Science in Industrial Technology with emphasis in Construction.
- All 31 participants responded that they had participated in a construction related internship.
- Although gender was not of concern in this study (only program information), only 2/31 (6%) of the respondents to the survey identified themselves as female.

## Major Findings: Status of Construction Education Internship Programs

Univariate analyses on the distribution of cases on only one variable at a time were conducted. The findings are reported by individual listing of each variable under study. Univariate analysis served the purpose of describing the survey sample, and by extension, the population from which the sample was selected. The data were analyzed utilizing frequency percentages and summary averages including: mode – the most frequent attribute, either grouped or ungrouped; and the mean.

Each variable of interest was included in this study separately, with the results or findings presented here:

### Internship as a Requirement for Graduation

It is apparent from Table 1, that a much larger percentage of students reported internship as a requirement for graduation than did the schools. It was also interesting that even though some programs did not require “internship”, these programs did require that students work a minimum number of hours in a construction-related position before graduation.

Table 1

### Internship as a Requirement for Graduation

	School	Student
Yes	50%	71%
Hours work required for graduation*	6%	
No	44%	29%
	(56)	(31)
Non-response	(6)	

\*(may be coop, internship or just work)

Internship is “Encouraged” Before Graduation

Although many of the schools of construction do not “require” a formal structured internship program, the data (see Table 2) support that they do “encourage” participation in internship or some real world construction-related experience before graduation.

Table 2

Internship "Encouraged" Before Graduation

	School	Student
Yes	91.0%	97%
No	9.0%	0%
	(56)	(31)
No Response	(12)	(1)

(may be coop, internship or just work)

Participation in Internship

Table 3 describes student and company participation in internship. Although it was reported that 97% of all students surveyed participated in an internship before graduation, in actuality one student (3%) *did* work in construction, but would not classify it as internship. The company survey reported an overall high percentage of participation in an internship. Participation by company “size” and by company “type,” as seen in Table 4, are quite high. Among company types, Industrial reported the lowest percentage of participation in internship programs. This lower response was a result of subcategory responses concerned with bridge and tunnel work. It may be deemed less desirable to hire inexperienced workers for such sensitive work environments. The high

percentages overall suggest that construction companies, no matter the type or size, encourage and participate in internships.

Table 3

*Participation in an Internship*

	Student	Company
Yes	97%	96%
No	3%	4%
	(31)	(75)

Table 4

*Participation by Company Size and Company Type*

	Percentage	By Type	Percentage	By Size
Yes	100%	Commercial	96%	Small
		Heavy		
	100%	Hwy/Civil	100%	Medium
	86%	Industrial	93%	Large
	100%	CM/Eng/DB	92%	Undisclosed
	88%	Misc.		

*Lengths of Internship*

It was the suspected variability across programs regarding length of internship that ultimately led to this entire study. When serving as an academic internship supervisor, the investigator noted that it was construction interns and construction companies that continually reported being less than satisfied with the lengths of internship. Because programs were of varying lengths, not all interns at any particular company had the same opportunities to impress the company with their skills and abilities. Company personnel also reported that it could be quite difficult to develop appropriate goals and objectives for each individual student based upon the variable lengths of time each might be present at a company. For internships that were deemed to be too short, company representatives reported that it was too difficult to accomplish any realistic goals and objectives. On the other hand, for internships that were too long, students reported experiencing increased hardships with regard to their living

arrangements. Extended travel, lodging and food were not as much a concern as were issues of lost roommates, leases, and educational opportunities. One company supervisor reported “that a ten week period of time or approximately one summer of work gives the student ample opportunity to display his abilities, while the construction company can still adequately put on a good face.”

As predicted by personal experience, the schools, students and companies participating in this study reported a great variety in the lengths of internship programs. “Length of Internship” as a variable, demonstrated great variability across all programs. Besides the six predetermined categories included in the survey instrument, several “Other” lengths were reported by schools and students, to include: voluntary, no fixed period, 23 days or 184 hours, 3 months of full time or equivalent, 16 weeks, two internships of 400 hours each, sometimes six months depending on employer’s program; minimums of 500, 800 and 1000 hours; and two separate full semesters. Summers, holidays and spring break were also reported in the “Other” category. Companies also reported supervising internships of varying lengths, with “Other” lengths to include: 6 months, holidays and summers, part-time during the school year, 12 weeks and 24 weeks, fall, spring and summer semesters, one year and depends on the school requirements.

Table 5 reveals that the length of 15 weeks (approximately one semester) had the largest percentage of responses among schools and companies, with the exception of their “Other” categories. It is also of particular interest that students reported zero participation in internships of that same length. Instead students reported the length

“Greater than fifteen weeks” as most common, again with the exception of their “Other” category. It is important to recognize that the table does not support one particular length of program, but rather supports the phenomenon that was believed to be occurring. That is, that the great variety of lengths of internship in place make it difficult for schools, students and companies to be satisfied with their length internship program.

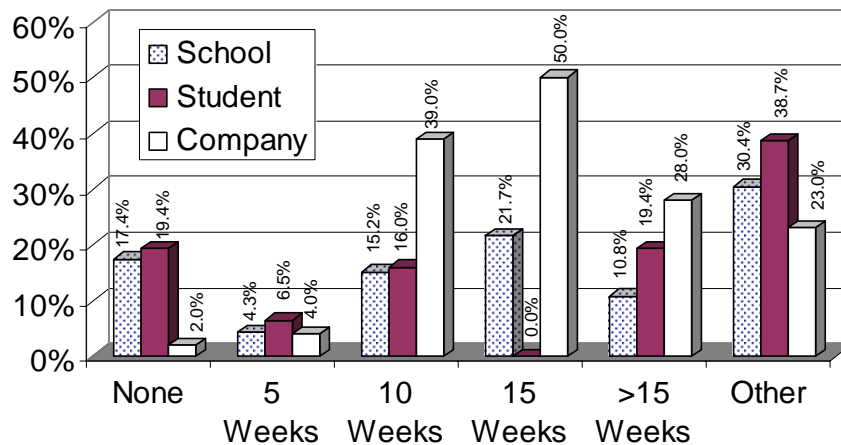
Table 5

*Lengths of Internship*

	School	Student	Company
None	17.4%	19.4%	1 Coop
5 Weeks	4.3%	6.5%	4%
10 Weeks	15.2%	16%	39%
15 Weeks	21.7%	0%	50%
>15 Weeks	10.8%	19.4%	28%
Other	30.4%	38.7%	23%
	(56)	(31)	(75)
No Response	(10)		(1)

For further clarification, Table 5 is shown graphically in Figure 2, providing a view of the percentages of occurrence reported by all three constituencies of this study. The figure reveals that more students participated in greater than fifteen-week programs than in ten-week programs, and more participated in ten-week programs than in five-week programs. The fifteen-week program data was puzzling, however, since not a single student reported participating in a fifteen-week program. This result was even more puzzling because the school data suggests that the schools utilize the fifteen-week length program more than either the ten-week or the greater than fifteen-week lengths. When observing the company data, note that the companies were allowed to check more than one category of length since they supervise more than one type of internship at any

one time. Therefore, the company data more realistically described the fact that they supervise a variety of different length programs, rather than supporting any one particular length of internship.



*Figure 2.* Frequency percentages related to “length” of internship programs reported by schools, students and companies. (Company responses do not add to one hundred percent. Since companies supervise more than one type of internship at one time, they were allowed to check all category lengths they supervise).

#### *Appropriate Length of Internship by Company*

More importantly, companies were asked to report what they deemed to be an “appropriate length” of internship. Table 6 details the responses by company. It is of interest to note that the answer to “none” was 0%. While five-week and fifteen-week lengths received about the same support, the ten-week category received one-half of all responses. The written responses included: ten-weeks or longer, twelve weeks, six

months, coop program, 3-4 months, one year, as much as possible; and it depends on the degree the student is pursuing.

Table 6

*"Appropriate" Lengths of Internship*

	Company
None	0%
5 Weeks	19%
10 Weeks	50%
15 Weeks	22%
>15 Weeks	11%
Other	5%
	(75)
No Response	(1)

*Paid Internships*

The consensus of the three constituencies surveyed, as shown in Table 7, was that interns were or should be allowed to be paid. Of the schools responding to this question 100% reported that students should be allowed to be paid. One school noted that no unpaid internships were supported for academic credit unless for a non-profit organization. The student and company surveys revealed that all responding to the question had paid interns. There is no disagreement about payment of interns.

Table 7

*Paid Internships*

	School	Student	Company
Yes	100%	100%	100%
No	0%	0%	0%
	(56)	(31)	(75)
No Response	(10)	(1)	(1)



*Tuition Credit Hours Paid for Internship*

Referring to Table 8, a much larger percentage of students reported not paying any tuition for internship credit hours as compared to the school response. While students most often reported paying no tuition for their experiences, the largest percentage of schools reported requiring three hours of tuition be paid. Also of interest were the write-in responses, including: 3 or 6 hours, optional, and one hour.

Table 8

*Tuition Credit Hours Paid for Internship*

	School	Student
None	37%	50%
3 Hours	46%	13.3%
6 Hours	8%	26.7%
>6 Hours	2%	3.3%
Other	7%	6.7%
	(56)	(31)
No Response	(10)	(1)

*Deliverables Required for Internship*

All constituencies were asked to report which of the deliverables, listed in the survey instruments, were required during their respective internship experiences (See Table 9). Among the “none” responses, all three constituencies reported relatively the same percentage, with approximately one-third indicating that no deliverables whatsoever were required. Overall the schools and students reported considerably higher percentages for almost every category than did the companies. Schools and students reported that Daily Logs were required at a relatively high percentage as compared to other categories of deliverables. While the Final Written Report was the

deliverable receiving the highest percentages of responses by the schools and students, it received a much lower response among companies. Only in the categories of Self Evaluation and Employer Evaluation did the percentages reported by companies approximate those reported by the schools and students. Of greatest concern were the responses relating to the Goals and Objectives and Site Visitation deliverables. While over half of students reported Goals and Objectives as a requirement, only one-third of schools and less than one-tenth of companies reported that Goals and Objectives were a requirement of their internship experience. It is the disparity of reporting among the three constituencies that is of concern. The two questions concerning Site Visitations as a requirement of the internship are also of interest. Only a small percentage of the constituencies, especially the companies, reported that an academic supervisor came to visit either the intern or the employer. These responses concerning Site Visitation may suggest an interpretation for the questions asked in Part Two of the survey instrument, "Does the school provide enough guidance for the student to be successful?", and "Does the school provide enough guidance for the employer to be helpful to the student." The requirement of "Deliverables" is an area of internship that demonstrates considerable variability across the three constituencies. In particular, the disparity of responses offered by the schools and students as compared to that of the companies is certainly of interest.

Table 9

*Required Deliverables*

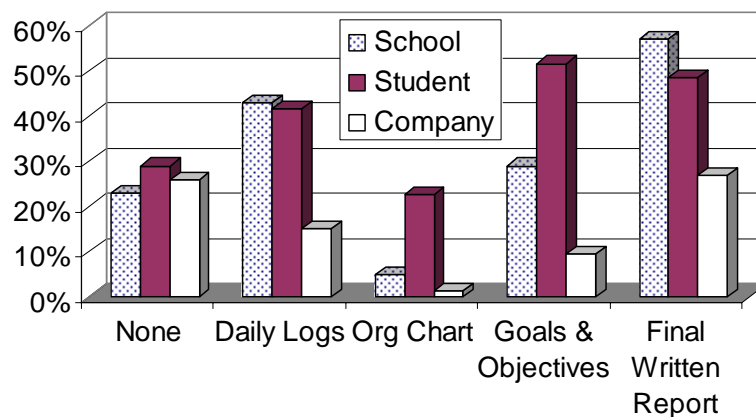
	School	Student	Company
None	23.0%	29.0%	26.0%
Daily Logs	43.0%	41.6%	15.0%
Org Chart	5.0%	22.6%	1.4%
Goals & Objectives	29.0%	51.6%	9.5%
Final Written Report	57.0%	48.4%	27.0%
Self Evaluation	21.0%	54.6%	38.0%
Employer Evaluation	37.5%	48.4%	44.0%
Contact Sheet	27.0%	22.6%	16.0%
Site Visit w/Student	18.0%	22.6%	5.0%
Site Visit w/Employer	14.0%	22.6%	3.0%
	(56)	(31)	(75)
			(2)

For further clarification, Table 9 is shown graphically in Figures 3 and 4, providing a view of the percentages of occurrence reported by all three constituencies of this study for each deliverable of interest. Figure 3 includes the categories of: None, Daily Logs, Organizational Charts, Formal Goals and Objectives and Final Written Report. Figure 4 includes the categories of Student Self Evaluation, Employer Evaluation, Contact Sheet, Site Visitation with Student, and Site Visitation with Employer.

Of particular interest is the disparity in the percentages reported by students, and companies in the Goals and Objectives category. While over one-half of students reported Goals and Objectives as a requirement (their highest response rate among all categories), only 9.5% of companies did likewise. Are the companies unaware of requirements that may be imposed on students by the schools? If so, what does this say about either the general coherence of construction internship programs, or the degree to

which companies take the internship seriously? This difference in perception may reveal one cause for dissatisfaction with the internship if two of the principal parties hold such widely varying perceptions about the Goals and Objectives of the internship.

The second most frequently reported deliverable by students was the Final Written Report (see Figure 3). Not surprisingly, this was the deliverable that schools reported most often as a requirement of internship, while companies reported a much lower percentage. As a matter of fact, companies reported the categories of “None” and “Final Written Report” at relatively similar percentages.



*Figure 3.* Frequency percentages related to each of the “deliverables required” in internship programs reported by schools, students and companies. This figure refers to the categories of: None, daily logs, organizational charts, formal goals and objectives, and final written report.

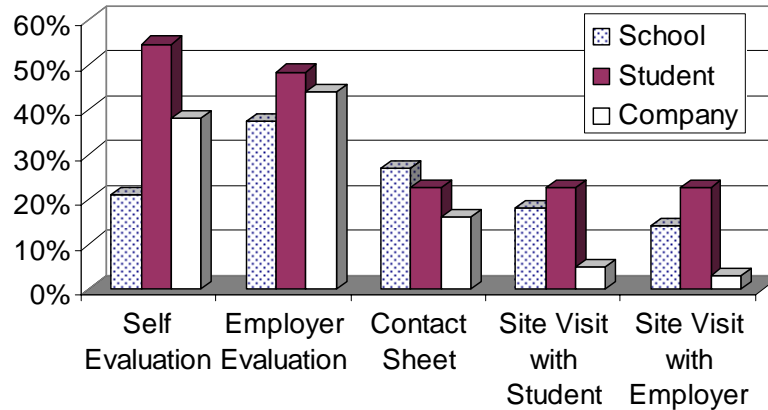
The third most frequently reported deliverable by students was the category of daily logs. While the schools and students reported daily logs to be required at a

relatively high percentage, the companies reported them at a much lower percentage. As before, this disparity that is intriguing.

The deliverable category “organizational chart” was reported by all three constituencies to be of less importance than the others depicted in Figure 3.

Of particular note in Figure 4 is the high percentage of responses by all three constituencies in the categories of student self evaluation and employer evaluations. Students reported self evaluation and employer evaluation at a higher percentage than did schools and companies. It was interesting that students reported self evaluation at a higher percentage than employer evaluation, especially since the schools and companies reported the opposite, with a lower incident of requiring self evaluation than employer evaluation. It was not surprising that among company responses, the employer evaluation category received its highest percentage. What was surprising, however, were the responses concerning the categories of contact sheet and site visitations (see Figure 4). Across constituencies, much lower levels of support were reported for the requirement of any of these three deliverables. Students reported exactly the same percentages of 22.7% across all three categories, while both schools and companies reported their lowest levels of support for site visitations of either variety.

When observing the category “contact sheet”, although all three constituencies reported requiring a contact sheet between the school, student and company at less than thirty percent, it was the disparity between the school and the company that stood out. The schools’ perceptions of contact sheet were a bit more favorable than that of students’ , and quite a bit more so than those of the companies’ .



*Figure 4.* Frequency percentages related to each of the “deliverables required” in internship programs reported by schools, students and companies. This figure refers to the categories of: Student self evaluation, employer evaluation, contact sheet, site visitation with student, and site visitation with employer.

Although the diminishing importance placed upon the categories of “site visitation with student” and “site visitation with employer” among both the schools and companies is noteworthy, it is the disparity between the school and company responses that is of particular interest. The schools report a much more optimistic perception of the requirement than do the companies for both categories. Note that the company survey reported less than 10% of programs required a site visit from the academic supervisor to either the intern or the employer.

#### *Dedicated Faculty or Dedicated Company Personnel*

In regard to Dedicated Faculty, the discrepancy between the school and student data compared with the company is displayed in Table 10. While schools and students reported almost one-half had academic faculty dedicated to the administration of the

internship program, companies reported less than twenty percent had a visit from an academic supervisor. The question was deemed to be confusing by the companies, but consensus was that there was little academic supervision or contact.

In regard to Dedicated Company Personnel (see Table 11), 41% of companies reported that they had personnel dedicated to the administration of an internship program, while 59% said they did not. However, it must be noted that a number of companies reported that they provided personnel for the direct, individual supervision of each student even though they may not have a personnel director of internship.

Table 10

*Dedicated Faculty*

	School	Student	Company
Yes	47%	43.3%	19.7%
No	51%*	56.7%	80%
	(56)	(31)	(75)
No Response	(9)	(1)	(9)**

\*One school reported insufficient faculty resources.

\*\* Confused, both, sometimes, unknown.

Table 11

*Dedicated Company Personnel*

	Company
Yes	41%
No	59%
	(75)

Companies reported direct, individual supervision of each student.

*Site Visitation from Academic Supervisor*

Responses across all constituencies indicate that a majority of academic supervisors do not visit the company or intern during the internship (see Table 12). This lack of contact between the schools and the site may be a cause for concern. It may help to explain student and company responses to questions asked in Part Two of the survey instruments regarding whether schools provide enough guidance for students and companies during the internship experience.

Table 12

*Site Visitation by Academic Supervisor*

	School	Student	Company
Yes	30%	27.6%	19.7%
No	70%*	72.4%	80.3%
	(56)	(31)	(75)
No Response	(9)	(2)	(9)**

\*One school reported insufficient faculty resources.

\*\* Confused, sometimes, unknown.

*“Provided” Internships vs. A List of Employers*

When investigating internship site selection, the majority of schools and students reported that internships were not “provided” by the school, and students were not matched to any particular company (see Table 13). However, most schools did provide a list of prospective employers for students to contact on their own (see Table 14).

Table 13

*School Provided Internship*

	School	Student
Yes	19%	24%
No	81%	76%
	(56)	(31)
No Response	(9)	(2)

Table 14

*School Provides a List of Internship Sites*

	School	Student
Yes	77%	70%
No	23%	30%
	(56)	(31)
No Response	(9)	(1)



*Industry Advisory Council*

The school survey revealed that 96% responded that they have an industry advisory council. Note in Table 15, that the school percentage is much greater than the company response. The company survey reported that only 63% are members of an industry advisory committee for at least one university or college construction program, while 38% reported they were not members of any advisory council.

Table 15

*Industry Advisory Council*

	School	Company
Yes	96%	63%
No	4%	38%
	(56)	(75)
No Response	(8)	(2)

*Career Fairs Within Construction vs. University-Wide Career Fairs*

It is apparent in Tables 16 and 17, while there are a large percentage of schools that do provide career fairs within their construction programs, there are many programs that must rely on the university or college for the career fair opportunities. Referring to Table 17, students and companies alike reported that they were taking advantage of the university-wide career fair opportunities. The number of career fairs attended by companies per year varied from none to more than fifteen. Table 18 shows that only 20% of students reported that they found their internship by attending a career fair; the others found the internship on their own.

Table 16

*Construction Career Fairs*

	School	Student
Yes	69%	76%
No	31%*	24%
	(56)	(75)
No Response	(8)	(2)

\*Two schools said the "university" provides the career fair.

Table 17

*University-Wide Career Fairs*

	Student	Company
Yes	93%	80%
No	7%	20%
	(31)	(75)
No Response	(1)	(1)

Table 18

*Hired from Career Fair*

	Student
Yes	20%
No	80%
	(31)
No Response	(1)

*Hours Worked During Internship*

Referring to Table 19, students reported typical number of hours worked per week. One-half or 50 percent reported working an average of forty hours per week. Of the students participating in the survey, forty percent reported working more than the expected forty hours per week, while only ten percent worked less than fulltime.

Table 19

*Hours Worked per Week*

	Student
Less than 40	10%
Average of 40	50%
More than 40	40%
	(31)
No Response	(1)

Work Environment

Referring to Table 20, The student survey revealed that interns worked in many different environments, with many different variations and combinations of work sites. Students were allowed to check *all* categories where they worked, so the percentages do not add up to one hundred percent. The numbers reveal the environments where interns are asked to work. From this investigation it is shown that the categories of Office and the Field have a much larger percentage of responses than the other categories. Comparatively, the categories of Headquarters and Other have lower percentage of responses.

Table 20

Work Environment

	Student
Headquarters	29%
Office	61%
Jobsite Trailer	42%
Field	65%
Other*	29%
	(31)

Students were allowed to check more than one response.

\*There were many variations of combinations of work environment.

Employment After Graduation

Table 21 depicts student responses regarding employment after graduation. The student survey revealed that 97% will seek employment after graduation, while one student will pursue graduate school and one did not respond. Note that 87% of students reported that their supervising company wanted to hire them after graduation; with an

additional 6.5% reporting that another construction company wanted to hire them. Only 6.5% of students reported that they were going to work in another field.

Table 21

*Employment After Graduation*

	Student
<hr/>	
Will you seek employment after graduation?	
Yes	97%
No	3%*
<hr/>	
Does the internship supervising company want to hire you?	
Yes	87%
No	13%
<hr/>	
If not, Does another construction company want to hire you?	
Yes	6.5%
No	6.5%
<hr/>	
If not, Will you go to work in another field?	
Yes	6.5%
	(31)
No Response	(1)
<hr/>	

\*One student will attend graduate school.

Please see Appendix E for a tabulation of results for subproblem one and subproblem two. This includes a replication of the questions asked in part one of each survey instrument, along with the tabulated responses given.

## Subproblem Two

The second objective of this study was to identify elements that students, employers, and faculty perceived to support a valuable, satisfactory internship experience.

### Major Findings

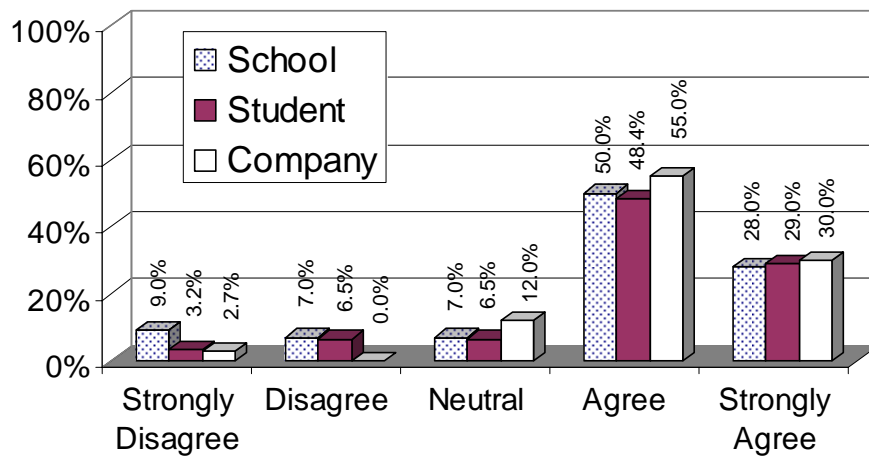
In Part Two of the School Survey, Student Survey and Company Survey, respondents were presented with statements in the questionnaire instruments; and asked to indicate the degree to which they “Strongly Disagree”, “Disagree”, are “Neutral”, “Agree” or “Strongly Agree” with each statement. Identical response categories were used for all three participant groups, in order to measure the given variables in a uniform manner. The five response categories were given the score of: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The Likert method was used for an *item analysis* resulting in the selection of the best items.

Univariate analyses on the distribution of cases on only one variable at a time were conducted. The findings are reported by individual listing of each variable under study. Univariate analysis served the purpose of describing the survey sample, and by extension, the population from which the sample was selected. The data were analyzed utilizing frequency percentages and summary averages including: mode – the most frequent attribute, either grouped or ungrouped; and the mean.

Each variable of interest was included in this study separately, with the results or findings presented here:

Pre-Hire Investigation

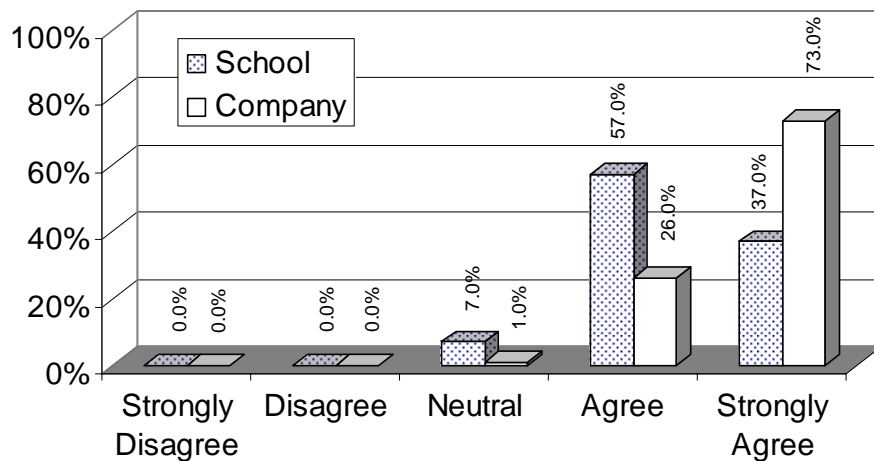
Figure 5 is a graphic representation showing that schools, students and companies certainly agree or strongly agree that one reason for providing an internship is for pre-hire investigation of the employing company.



*Figure 5.* The degree to which schools, students and companies rate pre-hire investigation of companies as one reason to provide internship.

*Insight into Student Abilities*

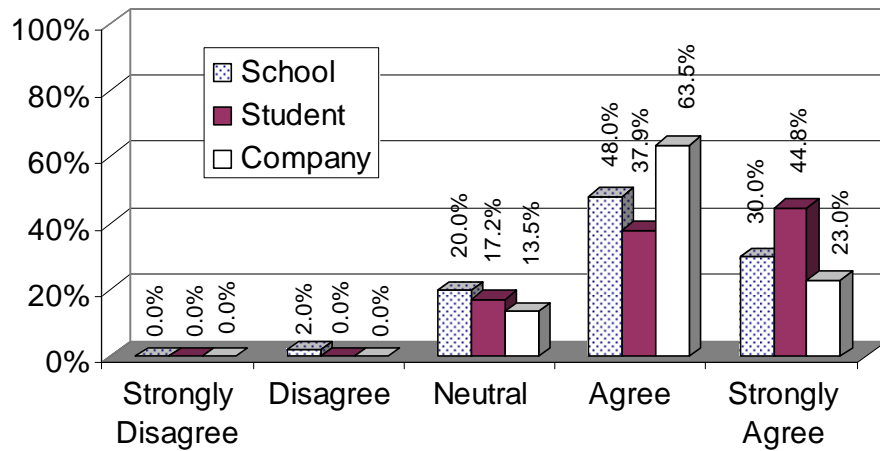
This study revealed that schools and companies agree or strongly agree that one reason for providing an internship is for pre-hire investigation of the students' abilities. It is apparent in Figure 6, that while the schools place their greatest support in the Agree category and less in the Strongly Agree category; the companies reported a more optimistic perception with less support in the Agree category and considerably more support in the Strongly Agree category.



*Figure 6.* The degree to which schools and companies rate pre-hire investigation of students' abilities as one reason to provide internship.

*Student Increased Self-Esteem*

The degree to which the constituencies agree that internship provides increased self-esteem of students is displayed in Figure 7. It shows that less than 20% of all constituencies support the Neutral or under categories. Students' perceptions showed an optimistic trend from Agree to Strongly Agree; while schools and companies although overwhelmingly agreeing with the statement, had a more pessimistic trend from Agree to Strongly Agree categories.

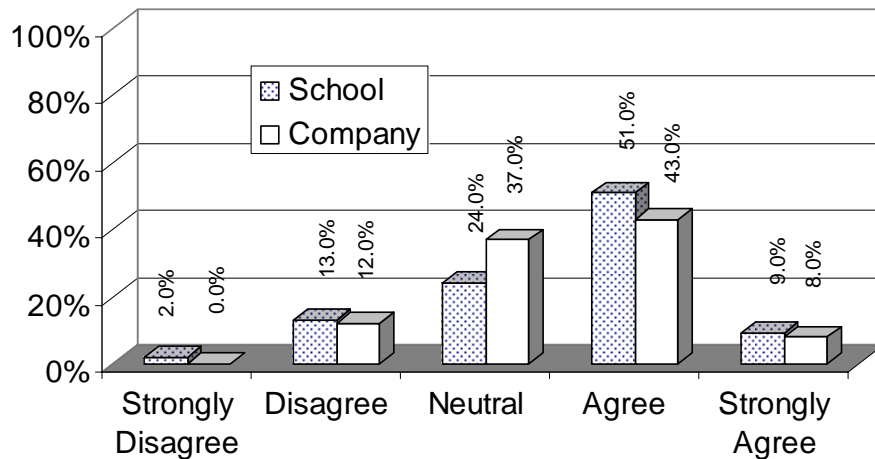


*Figure 7.* The degree to which the constituencies agree that internship provides increased self-esteem for the student.



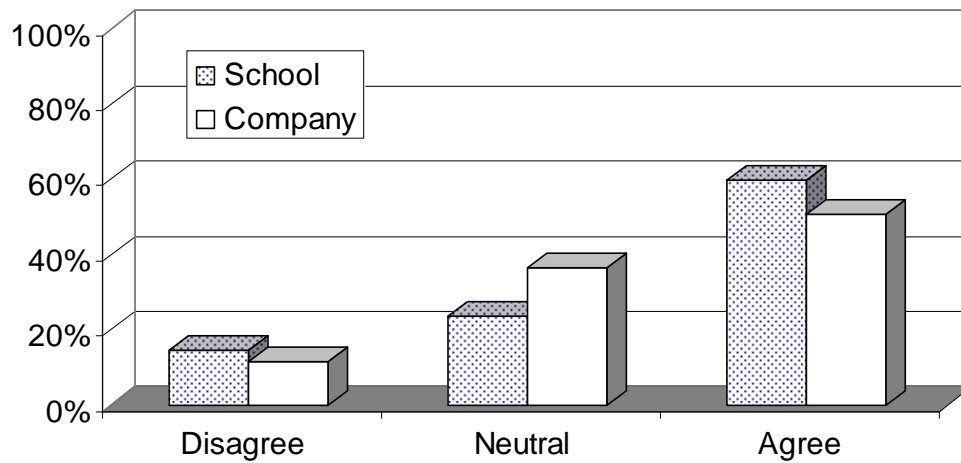
*Student Performance Represents Program Strengths/Weaknesses*

The frequency percentages used for other variables did not generate a clear picture of how schools and companies regard the statement that student performance during an internship represents the strengths or weaknesses of their construction education program (see Figure 8). The calculation of the means were employed. The school mean was calculated to be 3.51 and company mean was 3.47, with an overall mean of 3.49. If neutral equals 3 and agree equals 4, then the answer lies between neutral and agree. The strength of support was not sufficient to report agreement for this statement.



*Figure 8.* The degree to which schools and companies agree that student performance during an internship represents program strength or weaknesses.

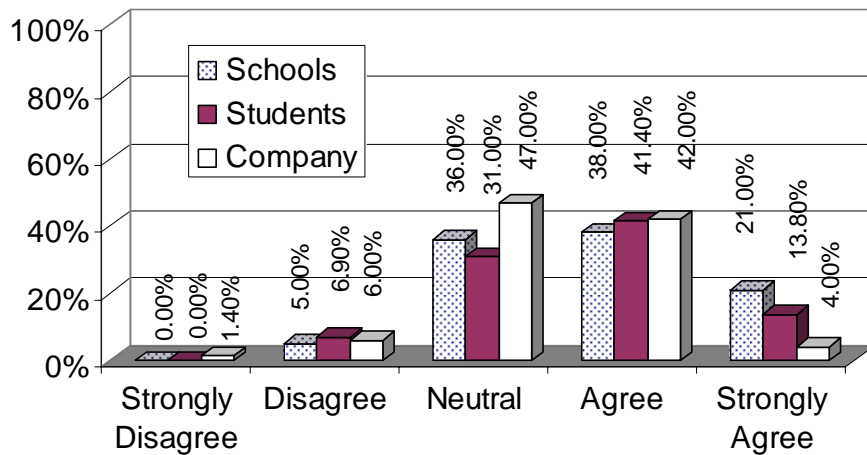
Because of the relatively small percentages of respondents selecting the two extreme response categories in the previous figure, the procedure of collapsing the categories (see Figure 9) was employed. Collapsing the extremes still did not generate a more conclusive picture than did the original data shown in Figure 8.



*Figure 9.* Collapsed extreme categories for data related to student performance as an indicator of program strengths or weaknesses.

*Deliverables Are Fair*

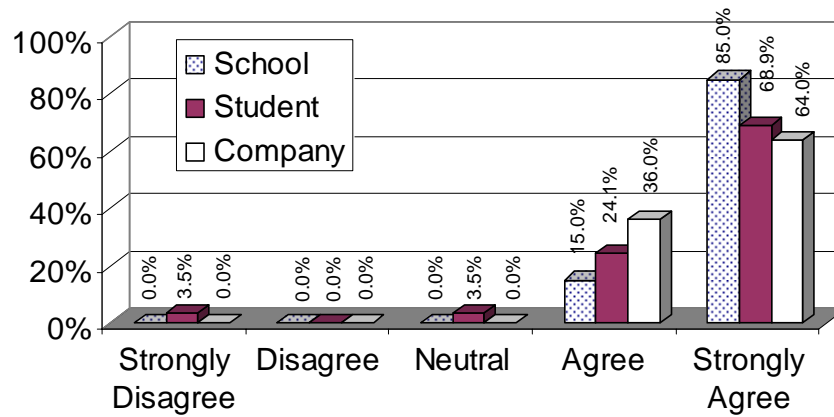
Again, the frequency percentages used for other variables did not give a clear picture of how the schools, students and companies – the “triad” regard the statement that the deliverables required for the internship fairly represent the work accomplished (see Figure 10). The calculation of the means were employed. The school mean was 3.76, the student mean was 3.40 and company mean was 3.41, with an overall mean of 3.52. There is no clear support for agreement on this statement.



*Figure 10.* The degree to which schools, students, and companies agree that deliverables required in the internship fairly represent the work accomplished.

*Interactions of Students With Professionals Are Considered Valuable*

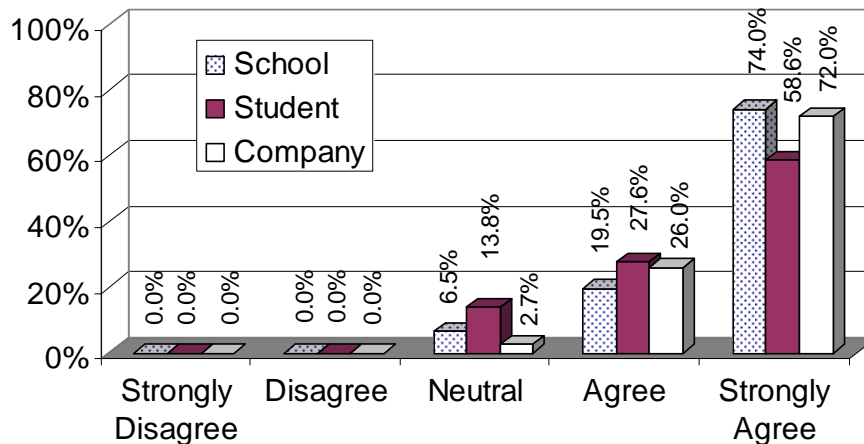
The data displayed in Figure 11, shows that there is strong support by *all* constituencies for the statement, that the interactions between students and professionals during an internship are considered valuable.



*Figure 11.* The degree to which schools, students, and companies agree that the interactions between students with professionals are considered valuable.

### Internship Experience Is Positive

As apparent in Figure 12, there was very strong evidence reported by schools, students, and companies to support the statement that internship is a positive experience, with the largest frequency percentage of responses in the Strongly Agree category and a relatively large percentage in the Agree category. Not one participant responded to the Disagree or Strongly Disagree categories.

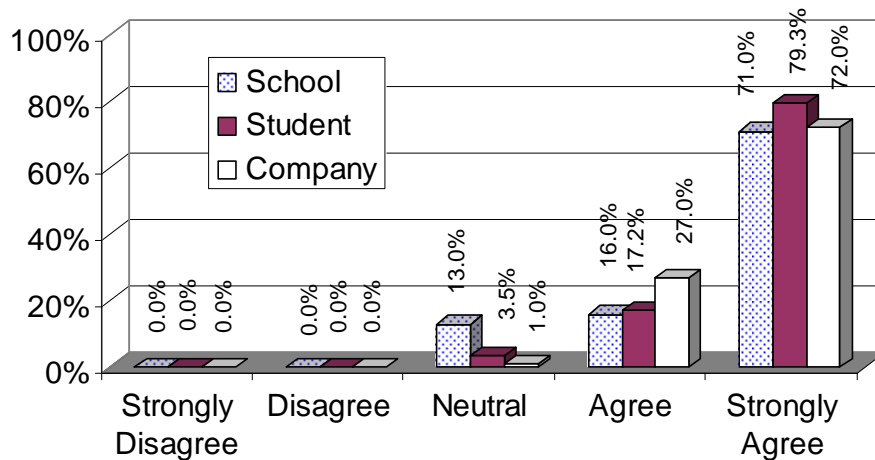


*Figure 12.* The degree to which schools, students, and companies agree that internship is a positive experience.

### Recommending Internship

Figure 13 revealed that there was very strong evidence reported by schools, students, and companies to support the statements that each group would recommend internship. While schools were asked to rate the degree to which they agreed with the statement “I would recommend internship to other construction education programs”; students rated the statement, “I would recommend internship to other students...”; and

companies rated the statement “I would recommend internship to other construction companies”.



*Figure 13.* The degree to which all constituencies of the study would recommend internship.

#### *Enough Guidance for Students to be Successful*

As displayed in Figure 14, the frequency percentages did not give a clear picture of how the “triad” rated the statement that schools provided enough guidance for students to be successful during internship. The calculation of the means were employed. The school mean was 4.18, the student mean was 3.96, and the company mean was 3.58, with an overall mean of 3.84. The means do not reveal adequate support for agreement. It is more interesting to notice the perceptions of the company as compared to the schools. While the school reports more Agree and Strongly Agree responses, the company has considerably more responses in Agree and Neutral categories.

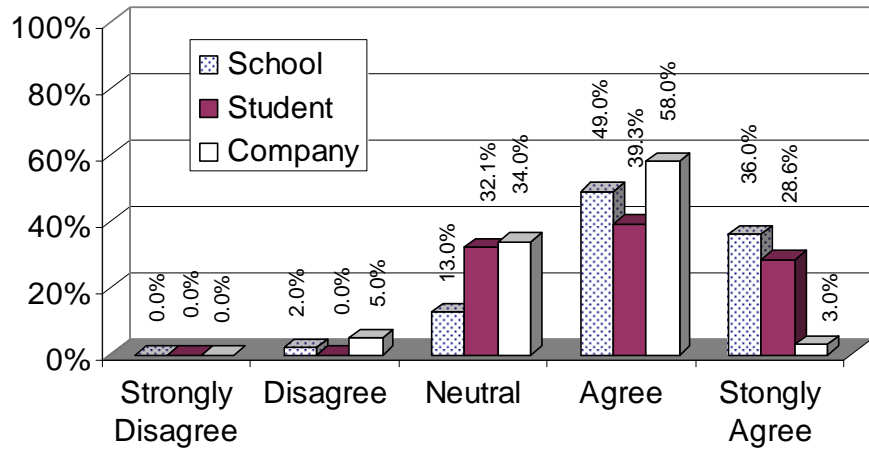


Figure 14. The degree to which constituencies agree that schools provide enough guidance for students to be successful in their internship.

To better clarify these results, see Figure 15. By collapsing the extreme categories, it was discovered that there is agreement to the statement.

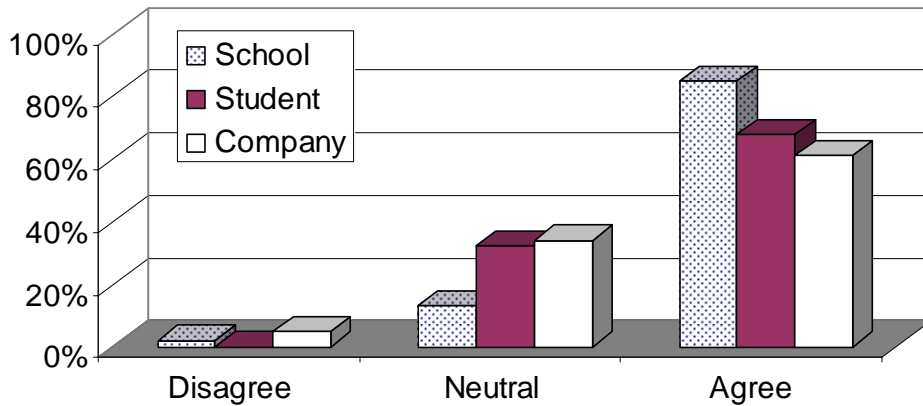
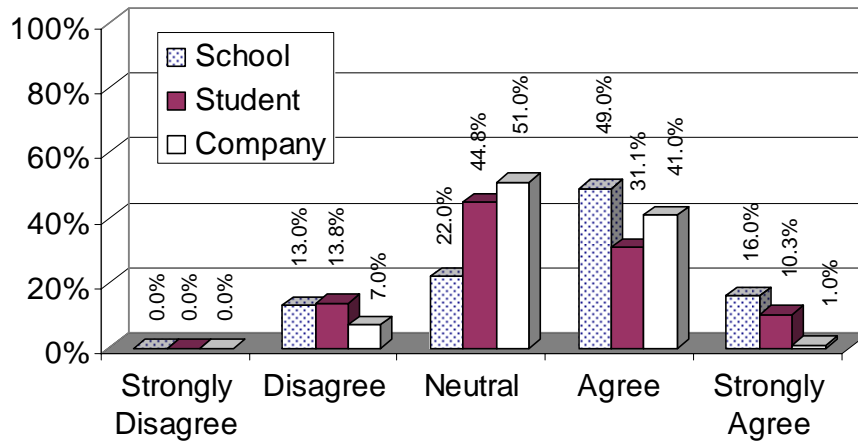


Figure 15. Collapsed extreme categories for data related to the degree to which schools provide enough guidance for students to be successful in their internships.

*Enough Guidance for Employers to be Helpful to Students*

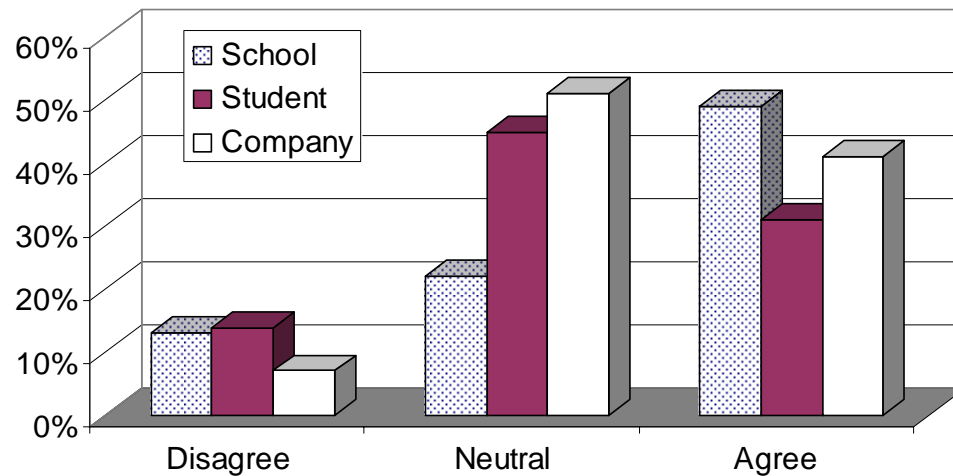
Because the frequency percentages displayed in Figure 16 did not give a clear picture of how the “triad” rated the statement that schools provided enough guidance for employers to be helpful to students during internship, the calculation of the means were employed. The school mean was 3.67, the student mean was 3.46, and the company mean was 3.37, with an overall mean of 3.46.



*Figure 16.* The degree to which constituencies agree that schools provide enough guidance for employers to be helpful to students during internship.



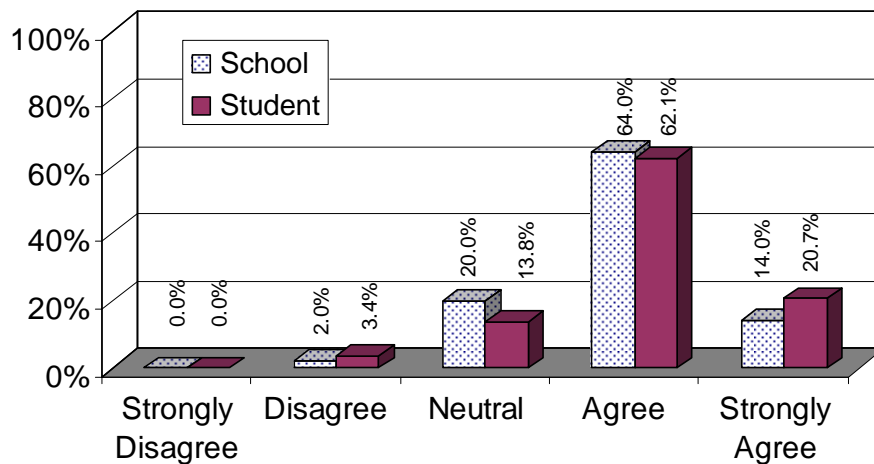
In order to clarify this issue, see Figure 17 for the collapsed extremes representation of the calculation. Note the disparity of perception of the constituencies in this view. Companies are revealed to be much more neutral in this view than the previous figure. While the students and the company have a more pessimistic perception of the situation, the schools are revealed to be quite optimistic. The schools strongly support the statement that they provide enough guidance to employers to be helpful to students during their internship. It is this disparity of perception that is intriguing.



*Figure 17.* Collapsed extreme categories for data related to the degree to which schools provide enough guidance for employers to be helpful to students during internship.

Appropriate Length of Internship

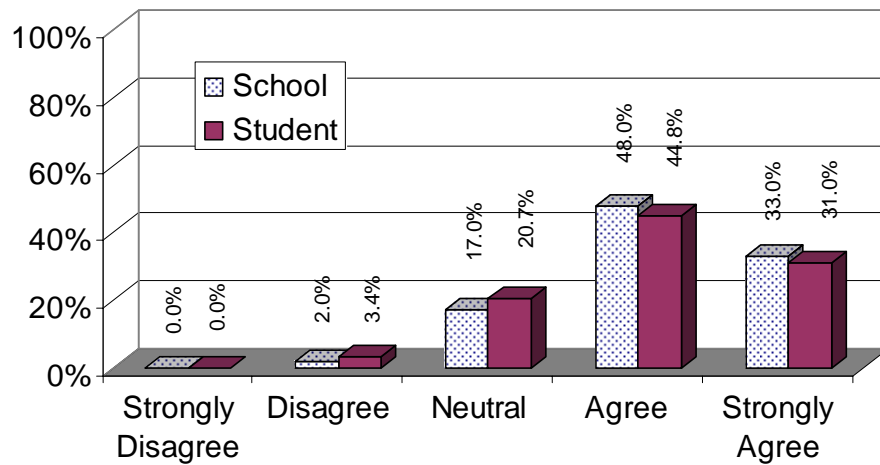
It must be noted that the company survey addressed this issue in Part One of the survey instrument and not in Part Two. Companies were already found to show strong support of the ten-week program as the appropriate length of internship. The graphical display in Figure 18, shows that schools and students strongly support the statement that their length of the internship experience was appropriate. Of interest and somewhat puzzling is the fact that each constituent reported great variability regarding length of internship, and yet they also responded that the lengths were appropriate.



*Figure 18.* The degree to which schools and students agree that the length of internship program is appropriate.

*Internship Helps Students in Subsequent Academic Performance*

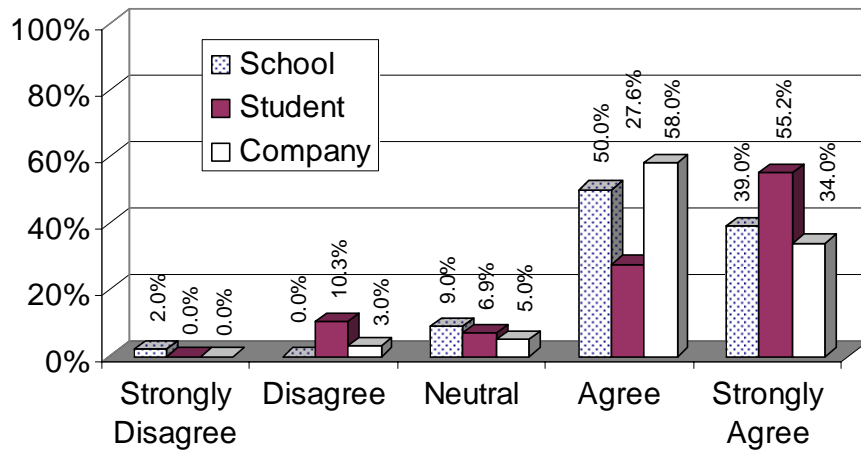
Students and schools alike reported a strong response to the statement that the internship experience helped students in subsequent academic performance. Figure 19 shows that this fact is undisputed.



*Figure 19.* The degree to which constituencies agree that the internship experience helped students in subsequent academic performance.

Clarification of Career Choices

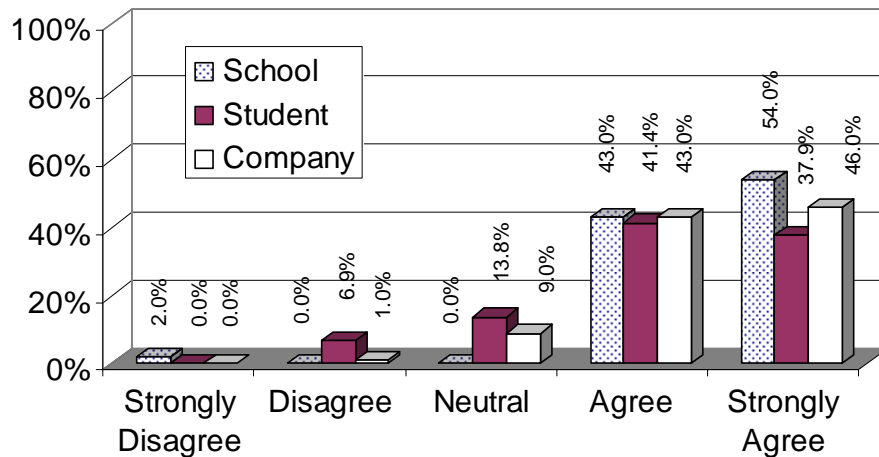
As evidenced in Figure 20, the study reported that schools, students and companies strongly support the statement that the internship experience helped students to clarify career choices.



*Figure 20.* The degree to which constituencies agree that internship helps students clarify career choices.

*Synthesis of Classroom Knowledge into Practical Application*

Referring to Figure 21, note the responses reported by schools, students and companies that strongly support the statement that internship provides the opportunity to synthesize classroom knowledge into practical application.



*Figure 21.* The degree to which schools, students and companies agree that internship provides the opportunity for students to synthesize classroom knowledge into practical application.

Please see Appendix E for a tabulation of results for subproblem one and subproblem two. This is a replication of the questions asked in part two of each survey instrument, along with the tabulated responses given.

### **Subproblem Three**

The third objective of this study incorporated the findings from the first and second objectives, to identify those common elements that provide construction education programs with a structure for their construction internship programs. From these identified common elements, a set of “best-practices” guidelines, or standards were developed for internships in the construction discipline.

The data from subproblem one and subproblem two supports a rationale for a construction education internship. In addition, the data support the rationale for developing construction internship standards or guidelines. Also presented here are the elements that have been identified as components of the structure for developing guidelines. These elements are not offered as specific criteria, but rather as general recommendations that will allow for flexibility in internship design and implementation.

#### **Rationale for Internship**

It was shown that internship provides: student benefits, school benefits and company benefits. The variables of interest in this study that revealed a rationale for participation in a construction education internship included:

Student Benefits:

- Pre-Hire Investigation of Companies
- Clarification of Career Choices
- Student Increased Self-Esteem
- Interactions between Students with Professionals is Valuable

- Internship is perceived to be valuable by All
- Improved Academic Performance, and
- Synthesis of Classroom Knowledge into Practical Application

Schools Benefits:

- Internship is perceived to be valuable by All
- Improved Academic Performance, and
- Synthesis of Classroom Knowledge into Practical Application

Company Benefits:

- Pre-Hire Investigation of Students
- Interactions between Students with Professionals is Valuable
- Internship is perceived to be valuable by All
- Synthesis of Classroom Knowledge to Practical Application

### **Rationale for Guidelines**

It was the variability across construction programs that support the rationale for standardization of the experience. The variables of study that revealed a rationale for the development of standard guidelines for construction internships included:

- Fair Deliverables
- Appropriate Length of Internship
- Enough Guidance for Employers
- Tuition Credit Hours

“Standard internship guidelines would not only promote consistency in program structure, they would also ensure that the needs of all involved are considered during planning and implementation. The challenge to educators is to design a program that meets the needs of the university, faculty, students and the internship site. Although no program can meet all these needs, a successful program attempts to address as many as possible during the design and implementation stages”. (Ferguson, 1998, p. 22).

### **The Structure for Developing Guidelines for a Construction Internship**

Presented here are the elements that have been identified as components of the structure for developing guidelines. These are not offered as specific criteria, but rather as general recommendations that will allow for flexibility in internship design and implementation.

Define Program Goals and Objectives

Develop Specific Evaluation Criteria

Standardize Length of Internship

Internship Site Selection

Paid Internships

Guidance and Orientation for All

Selection of University Supervisor

Selection of Cooperating Supervisor

Selection of Student

Site Visitation or Collaboration

Evaluation of the Program



## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### **Introduction**

This chapter includes a review of the findings, limitations, educational implications, conclusions, and recommendations for further study. The research objectives are restated first to provide a point of reference for the discussion and conclusions which follow.

#### **Restatement of the Objectives**

The following research objectives were formulated to address the research problem:

The first objective of this study was to describe construction internship programs in selected American universities reporting distinct characteristics that vary between programs.

The second objective of this study was to identify elements that students, employers, and faculty perceived to support a valuable, satisfactory internship experience.

The third objective of this study incorporated the findings from the first and second objectives, to identify those common elements that provide construction education programs with a structure for their construction internship programs. From these identified common elements, a set of “best-practices” guidelines, or standards were developed for internships in the construction discipline.

## **Review of the Findings**

### **Objective One: Status of Construction Education Internship Programs**

Although the data reported that only 56% of the schools surveyed “require” a formal structured internship program, the data support that over 90% “encourage” participation in internship or some real world construction-related experience before graduation. High percentages reported overall suggest that schools, students, and construction companies, no matter the type or size, encourage and participate in internships.

Schools, students and companies reported great variety of lengths of internship. It is important to recognize that the study does not support one particular length of program, but rather gives strong evidence of the phenomenon thought to be occurring. That is, variability across programs regarding lengths of internship have resulted in students and companies reporting frustration and dissatisfaction. Of greater importance, companies were asked to report what they deemed to be an “appropriate length” of internship. Note that not one company answered that the length “none” was an appropriate length for an internship. While the five-week and fifteen-week categories each received about the same support (approximately 20%), the ten-week category received one-half or 50% of all company responses. One company reported that the five-week summer internships are too short to provide optimal value to either party.

It was not surprising that the consensus of the three constituencies surveyed reported that interns were or should be allowed to be paid. There was no disagreement about compensation. Ferguson (1998) showed that there are legal issues associated with

non-paid internships. Other legal issues associated with internships include concerns of: workmen's compensation, unemployment insurance, EEOC guidelines, and general liability issues.

While students most often reported paying no tuition for their experiences, the largest percentage of schools reported requiring three hours of tuition be paid. An additional one-third of students reported paying six tuition credit hours.

Assessment of the student during an internship was also shown to have great variability across programs. All constituencies were asked to report which of the deliverables, listed in the survey instruments, were required during their respective internship experiences. Again, as was originally suspected, there was a great deal of variability among the required deliverables. While approximately one-third of the respondents did not require any documentation of the experience, others required up to ten different deliverables, in numerous combinations, to assess the experience. Overall the schools and students reported considerably higher percentages for almost every category than did the companies.

Of particular interest is the disparity in the percentages reported by students, and companies in the Goals and Objectives category. While over one-half of students reported Goals and Objectives as a requirement (their highest response rate among all categories), only 9.5% of companies did likewise. Are the companies unaware of requirements that may be imposed on students by the schools? If so, what does this say about either the general coherence of construction internship programs, or the degree to which companies take the internship seriously? This difference in perception may reveal

one cause for dissatisfaction with the internship if two of the principal parties hold such widely varying perceptions about the Goals and Objectives of the internship.

Messmer (1999) reported that the goals of the internship need to be agreed upon by all parties and should include a detailed job description outlining the intern's specific responsibilities along with his or her compensation, documentation of assessment with detailed performance appraisal, and the flexibility to adhere to criteria unique to particular schools. Guyton & McIntyre (1990) state that the roles and responsibilities of the triad members (student, college supervisor, and cooperating supervisor) and goals of the field experiences need to be clearly stated and there must be mutual understanding of them. Planned purposeful discussion might alleviate contradictions and frustrations.

The second most frequently reported deliverable by students was the Final Written Report. Not surprisingly, this was the deliverable that schools reported most often as a requirement of internship, while companies reported a much lower percentage. As a matter of fact, companies reported the categories of "None" and "Final Written Report" at relatively similar percentages. It was the disparity among the responses that was of concern. Why is it that the company does not perceive the final written report to be a required deliverable, when students and schools both report its requirement? Does this mean the companies are unaware of its requirement?

The third most frequently reported deliverable by students was the category of Daily Logs. While the schools and students reported daily logs to be required at a relatively high percentage, the companies reported them at a much lower percentage. As before, this disparity that is intriguing. Companies may or may not have been aware that

students were generating daily reflections of their work experience in addition to the work load the company was requiring.

Students reported the categories of Self Evaluation and Employer Evaluation at a higher percentage than did schools and companies. It was interesting that students reported Self Evaluation at a higher percentage than Employer Evaluation, especially since the schools and companies reported the opposite, with a lower incident of requiring Self Evaluation than Employer Evaluation. It was not surprising that among company responses, the Employer Evaluation category received its highest percentage. What was surprising, however, were the responses concerning the categories of Contact Sheet and Site Visitations. Across constituencies, there was much less support reported for the requirement of any of these three deliverables. Students reported exactly the same percentages of 22.7% across all three categories. When observing the category “Contact Sheet”, although all three constituencies reported requiring a Contact Sheet between the school, student and company at less than thirty percent, it was the disparity between the school and the company that stood out. The schools’ perceptions of Contact Sheet were a bit more favorable than that of students’, and quite a bit more so than those of the companies’.

The two questions concerning Site Visitations as a requirement of the internship are also of interest. Although the diminishing importance placed upon the categories of “Site Visitation with Student” and “Site Visitation with Employer” among both the schools and companies is noteworthy, it is the disparity between the school and company responses that is of particular interest. The schools report a much more optimistic

perception of the requirement than do the companies for both categories. The company survey reported less than 10% of programs required a site visit from the academic supervisor to either the intern or the employer. Responses across all constituencies indicate that a majority of academic supervisors do not visit the company or intern during the internship. This lack of contact between the schools and the site may be a cause for concern. It may help to explain student and company responses to questions asked in Part Two of the survey instruments regarding whether schools provide enough guidance for students and companies during the internship experience.

The requirement of “Deliverables” is an area of internship that demonstrates great variability across all programs. The disparity of the responses overall between the schools and students compared to the companies suggests that standardization of assessment of interns across programs needs to be addressed.

In regard to Dedicated Faculty, there was a discrepancy between the school and student data compared with the company. While schools and students reported almost one-half had academic faculty dedicated to the administration of the internship program, companies reported less than twenty percent had a visit from an academic supervisor. Responses across all constituencies indicate that a majority of academic supervisors do not visit the company or intern during the internship. In regard to Dedicated Company Personnel, 41% of companies reported that they had personnel dedicated to the administration of an internship program, while 59% said they did not. However, it must be noted that a number of companies reported that they provided personnel for the direct,

individual supervision of each student even though they may not have a personnel director of internship.

The lack of supervision by faculty and companies needs to be addressed. A need for more collaboration between the schools and the companies is evident. Selection, preparation and assignment criteria of university and cooperating supervisors must also be addressed. Faculty supervision and academic supervisor site visitation need to be incorporated into the internship program requirements.

When investigating internship site selection, the majority of schools and students reported that internships were not “provided” by the school, and students were not matched to any particular company. However, most schools did provide a list of prospective employers for students to contact on their own. One company representative stated that “...it is important for students to acquire the internship on their own”, and that “arranging accommodations and traveling to the internship location provides a great experience and sense of independence.”

A vehicle for connecting schools and students with industry is the industry advisory council. Schools reported that 96% have an industry advisory council, while only 63% of companies reported they are members of an industry advisory committee for at least one university or college construction program.

Career Fairs are another vehicle for students to make contacts with industry. While a large percentage of schools provide career fairs within their construction programs, there are many programs that rely on the university or college for the career fair opportunities. Although students and companies alike reported that they were taking

advantage of the university-wide career fair opportunities, only 20% of students reported that they found their internship by attending a career fair; the others found the internship on their own. Companies reported attending from none to more than fifteen career fairs per year.

One-half of all students reported working an average of forty hours per week, with forty percent working more than the expected forty hours per week, and only ten percent working less than fulltime. Interns reported working in many different environments, with many different variations and combinations of work sites. This investigation revealed that the office and the field had a much higher percentage of responses than other categories concerning work environment

The survey revealed that 97% of students reported that they will seek employment after graduation. It was interesting to note that 87% of students reported that the internship supervising company wanted to hire them after graduation; with an additional 6.5% reporting that another construction company wanted to hire them. Only 6.5% of students reported that they were going to work in another field after graduation.

### **Objective Two: Elements Perceived to be Valuable in a Construction Internship by Schools, Students, and Construction Companies**

In this part of the study, respondents were presented with statements concerning issues of internship; and asked to indicate the degree to which they “Strongly Disagree”, “Disagree”, are “Neutral”, “Agree” or “Strongly Agree” with each statement. Identical response categories were used for all three participant groups, in order to measure the



given variables in a uniform manner. The five response categories were given the score of: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The Likert method was used for an *item analysis* resulting in the selection of the best items. The data were analyzed utilizing frequency percentages and summary averages including: mode – the most frequent attribute, either grouped or ungrouped; and the mean. Each variable of interest was included in this study separately, with the results or findings presented here:

The data support that schools, students and companies agree or strongly agree that one reason for providing an internship is for pre-hire investigation of the employing company. And companies agree that one reason for providing an internship is for pre-hire investigation of the student's abilities. One company reported that internship gives the company an idea of whether the intern fits with the company culture. Another company respondent wrote that the internship provides familiarity of the basic expectations of the employer; and makes the transition to workplace faster and the intern becomes a contributor sooner. Lastly, one company respondent said that internships provide the broadest possible exposure to industry (rather than narrow exposure to a job or a responsibility).

The data support the statement that internship increases student self-esteem. It is of interest to note that the students perceptions showed an optimistic trend from Agree to Strongly Agree; while schools and companies although overwhelmingly agreeing with the statement, had a more pessimistic trend from Agree to Strongly Agree categories.

The strength of support was not sufficient to report that there was agreement for the statement, that student performance during an internship represent the strengths or weaknesses of a construction education program.

There was no clear support for agreement that the deliverables required for the internship fairly represent the work accomplished. The study supports that standardization of deliverables across programs need to be addressed.

It was shown that interactions between students and professionals during an internship are considered valuable by all constituents. One company wrote: “Construction companies can help interns to be better construction industry professionals”. A student participant reported internships were helpful in that interns were exposed to real-life situations, with helpful co-workers around to explain how things are supposed to be. Another student wrote, “Internship is real-life experience, with valuable contacts and an unforgettable experience.”

All constituencies support the statement that internship is a positive experience. Not one participant disagreed or strongly disagreed with the statement. However one school stated, “Internship is usually very positive, but depends heavily upon the employer and their experience with internship.”

The data showed strong evidence that schools, students, and companies support the statements that each group would recommend internship to their respective colleagues.

The study did not give a clear picture of how the “triad” rated the statement that schools provided enough guidance for students to be successful during internship. Nor

did a calculation of the means reveal adequate support for agreement. It is perceptions of the companies as compared to the schools that is interesting. While the school reports more Agree and Strongly Agree responses, the company had considerably more responses in the Agree and Neutral categories. Only by collapsing the extreme categories, was it revealed that there was slight agreement for the statement.

There was a disparity of perceptions among constituencies regarding the statement that schools provide enough guidance for companies to be helpful to students. Companies were much more Neutral. The students and the companies have a more pessimistic perception of the situation. The schools were shown to be quite optimistic. The schools strongly support the statement that they provide enough guidance to employers to be helpful to students during their internship. It is this disparity of perception that revealed the need for more guidance for the student and the company.

In part one of this study, companies reported strong support for the ten-week program as the appropriate length of internship; while. Part two of the study revealed that schools and students strongly support the statement that their length of the internship experience was appropriate. This is somewhat puzzling in that each constituent reported great variability regarding length of internship, and yet they also responded that the lengths were appropriate. Standardization across programs regarding length or duration of an internship need to be addressed.

Students and schools alike reported a strong response to the statement that the internship experience helped students in subsequent academic performance. One company respondent stated that internships help improve classroom performance. A

student respondent wrote that internship connected practical application with lecture topics.

The study reported that schools, students and companies strongly support the statement that the internship experience helped students to clarify career choices. One company respondent reported, “Students experience the *working world*; and internships enable them to make more informed decisions regarding their future”. Another company reported that hands-on experience and interaction with other young engineers on a project is most helpful in determining future goals and career objectives.

Evidence reported by schools, students and companies strongly support the statement that internship provides the opportunity to synthesize classroom knowledge into practical application. One school reported that internship lets students know that what they are learning will help them in their career. One company respondent wrote, “Nothing in a classroom can adequately prepare or compare with real life hands-on experience.”

One last comment made by a company regarding internship included: “Win-Win-Win. Students gain practical experience, while companies benefit from their help and enthusiasm. Students get exposure to the company. The company gets exposure to the student. There is no downside.”

### **Objective Three: The Structure for Developing Guidelines for Construction**

#### **Internships**

The third objective of this study incorporated the findings from the first and second objectives, to identify those common elements that provide construction education programs with a structure for their construction internship programs. From these identified common elements, a set of “best-practices” guidelines, or standards were developed for internships in the construction discipline.

From the data a rationale for a construction internship was revealed. In addition, the data gave support for the rationale for developing construction internship guidelines. Also presented here are the elements that have been identified as components of the structure for developing guidelines. These are not offered as specific criteria, but rather as general recommendations that will allow for flexibility in internship design and implementation.

#### *Rationale for Internship*

It was shown that internship provides: student benefits, school benefits and company benefits. The variables of interest in this study that revealed a rationale for participation in a construction education internship included the following:

##### Student Benefits:

- Pre-Hire Investigation of Companies
- Clarification of Career Choices
- Student Increased Self-Esteem
- Interactions between Students with Professionals is Valuable

- Internship is perceived to be valuable by All
- Improved Academic Performance, and
- Synthesis of Classroom Knowledge to Practical Application

Schools Benefits:

- Internship is perceived to be valuable by All
- Improved Academic Performance, and
- Synthesis of Classroom Knowledge to Practical Application

Company Benefits:

- Pre-Hire Investigation of Students
- Interactions between Students with Professionals is Valuable
- Internship is perceived to be valuable by All
- Synthesis of Classroom Knowledge to Practical Application

*Rationale for Guidelines*

It was the variability across construction programs that gave support to the rationale for standardization of the construction internship experience. The variables of study that revealed a rationale for the development of standard guidelines for construction internships included:

- Fair Deliverables
- Appropriate Length of Internship
- Enough Guidance for Students and Employers

“Standard internship guidelines would not only promote consistency in program structure, they would also ensure that the needs of all involved are considered during planning and implementation. The challenge to educators is to design a program that meets the needs of the university, faculty, students and the internship site. Although no program can meet all these needs, a successful program attempts to address as many as possible during the design and implementation stages”. (Ferguson, 1998, p. 22).

### **The Structure for Developing Guidelines for a Construction Internship**

Presented here are the elements that have been identified as components of the structure for developing guidelines. These are not offered as specific criteria, but rather as general recommendations that will allow for flexibility in internship design and implementation:

Define Program Goals and Objectives

Develop Specific Evaluation Criteria

Standardize Lengths of Internship

Internship Site Selection

Paid Internships

Guidance and Orientation for All

Selection of University Supervisor

Selection of Cooperating Supervisor

Selection of Student

Site Visitation or Collaboration

Evaluation of the Program

### **Limitations**

One limitation of this study was that it was conducted at a particular time and may not generalize to a different time period. Schools, students and companies are affected by extraneous conditions out of their control and may respond differently when faced with a different set of conditions. Current events, economic conditions and supply and demand of students may have had an affect on this study. However, a study conducted by Cook, Parker and Pettijohn (2004) was an on-going 10-year longitudinal study of internship. It revealed that the perceived value of internship and attitudes toward it remained relatively constant over the long period. The results lead to the conclusion that students, regardless of time and university affiliation, regard internship programs as positive.

This study was dependent on the number of programs surveyed and the number of programs, students and companies that actually participated. Although the student population was not as robust as anticipated, there was considerable representation across the programs with 31 students, representing eleven different schools, located in nine different states. Companies and schools had an adequate response rate comparatively.

One area that was not addressed in this study was the criteria for the selection of students for participation in internship. Studies have shown strong evidence supporting that upper class standing is the appropriate sequencing of the internship (Smith, 1964; Lowe, 1965; and Beard, 1998). Marshall (1999) reported that the internship experience is an extension of the classroom, where the intern transitions classroom theory into practice. In order to accomplish this, the intern needs to have the majority of curriculum



accomplished, giving them a wide knowledge base to work from. “Upper class standing is important to optimize the internship experience.” (Marshall, 1999, p.3). Personal conversations with students that waited until *all* coursework was completed before going for their required internship, had the expectation that internship was a waste of time and nothing more than a roadblock to eventual employment. It was of interest, however, that these same students responded to this study with higher than expected satisfaction of the benefits that internship afforded; each reporting that internship was a positive experience.

### **Educational Implications**

By developing standardized guidelines for construction education internships across all programs, adequate resources for the administration, implementation, supervision and improvement of the internship program will be necessary. By “requiring” the internship program for course credit, the funds generated from tuition will help provide the necessary financial resources to support the program. There is still the matter of personnel resources. Dedicated faculty including supervisors and a coordinator will be necessary. Faculty Supervisors must be willing and have the expertise to supervise the internships. There must be sufficient guidance from construction education programs regarding the requirements of internship for students to be successful and for companies to be able to help students during the internship experience. A University Coordinator will serve as a liaison for the program. The University Coordinator’s role involves recruitment, administration, guidance, and a great deal of quality control (Marshall, 1999). Coordination of the internship program, while

building connections, collaborative efforts and partnerships with industry are additional roles of the coordinator. Students will also have to invest in the internship program with additional resources. Students will have to pay for tuition credit hours and be willing to participate in either a full summer or one long semester of internship experience.

Although these implications seem overwhelming, this study revealed that the benefits of a structured, required internship program will far outweigh the investments.

### **Conclusions**

The following conclusions and recommendations were formulated based on the findings of this study. It was concluded that a set of “best-practices” standards or guidelines were needed for the construction education discipline.

### **Guidelines for a Construction Education Internship Program**

The set of best-practices guidelines presented here use the structure developed in subproblem three to provide a flexible framework for developing a construction education internship program:

#### *Defined Program Goals and Objectives*

In order to design and implement a valuable internship program, the constituencies must consider the internship’s importance or its purpose, and define goals and objectives for the experience. A formal agreement between academia and industry can minimize misunderstanding, frustration or dissatisfaction; and provide for a valuable internship experience. Hite and Bellizzi (1986) noted that too often lack of

understanding of the internship expectations lead to disappointment for firms and students and suggested that better understanding of student expectations would improve the process and outcome for the internship program. The *ATE Standards* state there must be collaboration with commitment to simultaneous review and reform where the goals and mission of the program and the goals and processes of the field experience are developed and agreed upon collaboratively by the university and the cooperating entity (ATE, 2000).

The internship must be “required” for graduation. The student should pay tuition for credit hours, and receive credit toward their degree. A grade must also be assigned, based on specific evaluation criteria. These requirements serve many purposes. By requiring the internship, paying for the experience, and receiving a grade, students will take the experience more seriously. The tuition also helps to provide necessary resources for adequate administration, implementation, and appropriate faculty supervisor visitation. The data does not support an exact number of tuition credit hours be paid. This number must be determined by individual institutions. The grade may be a pass/fail grade, but must be a requirement for graduation. Cook, Parker and Pettijohn (2004) reported that if the mission of the university is to graduate well-rounded individuals, the internship experience needs to be required rather than optional. Other literature suggests internship as a requirement for graduation (Marshall, 1999). Chapin, Roundebush and Krone (2003) reported 58% of construction programs require a more formalized experience. Many studies reported three to four credit hours being paid in tuition (Lowe, 1965; Beard 1998; Chapin et al. 2003).

*Develop Specific Evaluation Criteria*

Although flexibility is prerequisite, there must be standardized assessment of the internship experience; with many opportunities for evaluation and different kinds of assessment. While the faculty supervisor should assign the final grade, there must be input from the employment supervisor. The deliverable found to be most needed in an internship was: Formal Goals and Objectives, agreed to by all parties. They should include a proposed training plan with detailed job descriptions outlining specific responsibilities, with the flexibility to meet the changing needs of the construction project. The second deliverable of interest was Daily Logs. Daily Logs allow the intern to reflect on: daily activities, interactions of and with professionals, lessons learned, and synthesis of classroom knowledge into practical application. The frequency that these logs are submitted to the academic supervisor is a matter for the constituencies to discuss and agree upon. The Final Written Report provides an opportunity for students to demonstrate their communication skills and their ability to reflect on the holistic experience. The length of paper is not as important as its content, but should adequately describe the internship experience. Student Self Evaluations and Employer Evaluations (both Midterm and Final) provide additional input to the academic supervisor for assignment of a grade. These evaluation forms need to be constructed so that minimal attention is required. And lastly, a Faculty Supervisor Site Visitation should be a requirement of the internship. The visit provides the student with necessary feedback, additional guidance as necessary; and provides additional guidance to the company, and encourages collaboration between the school and the company.

### *Standardize Length of Internship*

While flexibility concerning timing or duration of the internship program is essential, the findings suggest that there should be some standardization across construction programs. The data supported that an internship program of a minimum of ten-weeks result in a positive experience. Shorter programs make realistic goals and objectives harder to accomplish; while longer programs (more than one long semester) increase hardships on students (lost roommates, lost leases, and lost educational opportunities were reported).

### *Internship Site Selection*

Internship experiences occur in sites characterized by school/company collaboration where there is a commitment to concurrent review and reform for the purpose of better serving students. The investments made by all three participants in an internship need to be balanced against potential returns to determine if a program is viable (Flesher, Leach and Westphal, 1996). Industry must provide dedicated managers to plan and implement the program; staffing support and project supervision; and administrative resources. Messmer (1999) suggested that the company must invest time, money and the resources necessary to make the process successful for both the intern and the firm. The company needs to provide a range of specific business tasks or projects that will be meaningful to the student. Projects must allow the intern to gain practical work experience with exposure to different work environments. The infrastructure, including office space and computer access, must be sufficiently supported, along with appropriate supervision (Messmer, 1999). Construction education

typically does not choose the work context for its students, nor does it formally promote work in “diverse populations”. Construction is considered to be, by its very nature, diverse and therefore provides a diverse working environment.

### *Paid Internships*

The study revealed that all constituencies reported that interns should be allowed to be paid. Ferguson (1998) showed that there are legal issues associated with non-paid internships. Other issues associated with non-paid internships include concerns of: workmen’s compensation, unemployment insurance, EEOC guidelines, and general liability issues. Additional literature also suggests that internships be paid (Beard, 1998; Hite and Bellizzi, 1986; Lowe, 1965; and Marshall, 1999). The study by Chapin et al. (2003) reported hourly wage ranges, but this is an issue that must be left to the participants for agreement.

### *Guidance and Orientation for All*

There must be sufficient guidance from construction education programs regarding the requirements of internship in order for students to be successful and for companies to be helpful to students during the internship experience. Contact sheets provide for communication of all participants. An orientation session should be provided for students at the school prior to the onset of the internship experience, complete with a list of internship requirements and an explanation of assessment measures (examples of acceptable deliverables should be provided). While orientation sessions for companies would be difficult at best, an internship packet that explains the requirements of the student and the responsibilities of the company supervisor; along with an explanation of

assessment procedures is necessary. There must be sufficient time allocated for a cultural orientation of the student and consistent feedback on progress (Messmer, 1999). The *ATE Standards* conclude there must be continuous communication and interaction through on-site observations, cross-site interactions, and use of communications technology. Quality interactions facilitate a professional learning environment and decrease communication problems. Students demonstrate increased self-confidence and skills in communication (ATE, 2000).

#### *Selection of University Supervisor*

University supervisors must include faculty that are willing to answer questions, provide resources, and spend time onsite assisting partners; and are willing to continue development of diverse partnering opportunities (Flesher, Leach and Westphal, 1996). The academic supervisor must be readily available to assist the student or the hosting firm. The communication process between the “triad” – student, hosting firm and university, must occur prior to and continuously throughout the experience. University supervisors provide the contact and guidance for students and employers. Ultimately the academic supervisor assigns the intern’s grade and is responsible for making the site visitation with the intern and the cooperating supervisor.

#### *Selection of Industry Supervisor*

Industry Supervisors need to have the time, desire and ability to take on the added responsibility of managing and training interns. The industry supervisor must create a supportive, nurturing environment with at least one mentor (someone other than the supervisor) who can offer guidance, encouragement and general counsel (Messmer,

1999). The intern's industry supervisor also completes intern performance evaluations and is the primary supervisor for support and expertise.

### *Selection of Students*

Although the study did not ask about the timing or sequencing of the internship, the literature suggests that upper class standing is desirable (Smith, 1964; and Lowe, 1965). Internship experiences occur in a sequence consistent with the goals and mission of the construction education program. Kendall's study (as cited by Ferguson, 1998) reported that only interested, qualified, and conscientious students should participate in internship. Most students qualify for internship based on successful completion of prerequisite courses with a common measure of grade point average. "Upper class standing is important to optimize the internship experience." (Marshall, 1999, 3).

### *Site Visitation or Collaboration*

The study revealed that site visitation and university-industry collaboration or partnership are important elements of an internship program. Internship programs must receive adequate resources including expertise and financial support for the administration and implementation of quality experiences. Both academia and industry resources are necessary. According to Marshall (1999), the university coordinator's role involves recruitment, administration, guidance, coordination, and a great deal of quality control. The coordinator must be readily available to assist the student or the hosting firm. The communication process between the "triad" – student, hosting firm and university coordinator, must occur prior to and continuously throughout the experience.



The coordinator is the established liaison with the industry, maintains the historical relationship, and insures the quality and consistency of the program. Adcox (2000) posits that the internship experience is a partnership between construction industry work sites and the university's academic environment. Each partner bringing a special and necessary area of expertise to the partnership, thus enabling on-site directing managers to assist and direct the construction management student to progress from novice to productive construction manager. Coco (2000) states that collaboration between universities and companies can result in monetary support to the university, guest lecturers, and field trip opportunities. Flesher, Leach and Westphal (1996) reported that academic investments include providing dedicated personnel and resources to the planning, implementation, and improvement of the program; administrative services; and dedicated faculty for appropriate supervision. Marshall (1999) reported that internship partnerships afford opportunities for equipment donation, scholarships, faculty sabbaticals and is a source of members for industry advisory boards. Faculty, as cited by Marshall (1999) " An internship program can foster closer interaction between the employers and the university, making employers more aware of the educational opportunities and ensuring that the program is responsive to the needs of employers".

#### *Evaluation of the Program*

Internship experiences must be assessed using a model that addresses realistic goals and objectives and promotes high expectations. Assessment must be on-going, and used for program improvement. This model must include input from all those involved in the experience, including school programs, faculty supervisors, students, cooperating

firms and industry supervisors. (ATE Standards, 2000). Although the areas of context or setting, the placement process, rewards and accountability and compliance with state and local policies/practices were additional areas of concern for teacher education, only the areas of: collaborative fostering, professionalism, program goals, candidate outcomes, benefits to students, and resources were supported in the data.

### **Recommendations for Further Study**

The following recommendations were made based on the findings of the study:

1. It was recommended that the study be replicated acquiring a larger sample and greater statistical power for all constituencies. Although the responses were sufficient to reveal distinct characteristics across construction education programs, and were also sufficient to reveal a commonality of responses regarding the predetermined statements concerning internship, it was the non-responses that are of concern.
2. It was recommended that future studies be conducted by the American Council for Construction Education (ACCE), the accreditation agency of construction education who purports: “Fostering national unity in construction education and construction practice; relating education to practice for the mutual benefit of both the construction industry and society”; and, “Encouraging representatives from construction education, practitioners, and the general public to share in discussions and resolution of problems related to the preservation and advancement of standards for construction

education”. Standards developed and approved by a prominent accrediting agency such as ACCE will have far more beneficial effects on construction education programs. A task force regarding the impact, dissemination, implementation and continuous improvement of internship standards should be created.

3. It was recommended that future studies be conducted concerning sequencing or timing of the internship experience. Even though the literature suggests that upper-class standing is important, it does not address the problem of “senioritis” or the phenomenon related to students waiting until all course work is completed before going out for internship.
4. It was recommended that future studies be conducted concerning tuition for course credit hours. Although the study revealed that tuition should be paid if course credit is given for the internship as a requirement for graduation, the number of credit hours needs to be studied more closely.
5. Lastly, it was recommended that future studies be conducted that address issues concerned with acquiring necessary resources (both expertise and financial) in order to implement a required internship program.

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## APPENDIX A

**Sample Survey Questions****PARTICIPANT SURVEYS****Surveys - School Participant Information**

Participating University:  
College Affiliation:  
Program Emphasis:  
Your Title:  
Phone number:  
Extension:  
Username:  
Password:  
Hint Word:

**Surveys - Student Participant Information**

Participating University:  
Classification:  
Major:  
Username:  
Password:  
Hint Word:

**Surveys - Company Participant Information**

Participating Company:  
Industry Emphasis:  
Annual Contract Sales:  
Your Title:  
Phone:  
Extension:  
Username:  
Password:  
Hint Word:

**Surveys - Participant Information**

Today's Date  
First Name:  
Middle Initial  
Last Name:  
Gender  
E-Mail Address:  
Participant Type:



## SCHOOL SURVEY

**Directions:**

If at any time you need to exit the survey without finishing, please feel free to go to the end of the survey and press the "Submit Responses" button. Your partial survey answers will be stored as temporary records. You will need to use the username and password you provided in the participant information section to gain access to this survey in order to finish.

Once finished, please check the "Finished Survey" checkbox. Once checked, information is permanently stored in the database and you will not be allowed to return to the survey.

**PART ONE - This part of the survey describes current internship programs.**

1. Does your school "require" internship as part of the curriculum for graduation?  
Yes                      No
  
2. Does your school "encourage" an internship or experiential component?  
Yes                      No
  
3. What length of program do you require?  
0 weeks  
5 weeks  
10 weeks  
15 weeks  
>15 weeks  
Other
  
4. If other, please describe: \_\_\_\_\_
  
5. How many construction majors do you have presently enrolled in your construction program?  
< 50  
50 to 100  
101 to 200  
>200
  
6. What is the name of your university construction education program? \_\_\_\_\_
  
7. What degree is offered in construction? \_\_\_\_\_
  
8. What is the name of the construction major? \_\_\_\_\_
  
9. How many tuition credit hours do students pay for their internship experience?  
None  
3 hours  
6 hours  
>6 hours
  
10. How many students were enrolled in your internship program:  
Spring 2003? \_\_\_\_\_  
Summer I 2003? \_\_\_\_\_  
Summer II 2003? \_\_\_\_\_  
Entire Summer? \_\_\_\_\_  
Fall 2003? \_\_\_\_\_

11. Can you provide a list of students that participated in any of the above programs?

Yes                      No

12. Will you encourage students to participate in a student survey upon graduation?

Yes                      No

13. What deliverables are required in your internship program? (check all that apply)

None

Daily Logs

Organizational Charts

Formal Planned Goals & Objectives

Final Report

Student Evaluations - Midterm and Final

Supervisor Evaluations- Midterm and Final

Contact Sheet for Employment Supervisor

Academic supervisor site visit w/student

Academic supervisor site visit w/employer

14. Do you have faculty dedicated to the internship program?

Yes                      No

15. Did an academic internship supervisor make site visitation (s)?

Yes                      No

16. Does the school provide internships?

Yes                      No

17. Does the school provide a list of prospective employers for internship?

Yes                      No

18. Does the construction program provide a career fair for students to make contacts for future employment/internship opportunities?

Yes                      No

19. How many times a year do you have a career fair?

None                      One                      Two

20. Does your construction program have an industry advisory committee?

Yes                      No

21. How many students graduated from the construction program:

Spring 2003?

Summer 2003?

Fall 2003?

22. Do you allow students to be paid by internship employers?

Yes                      No

**PART TWO - This part of the survey asks you to rate the following qualities of the internship experience:**

Questions 1-14 have these responses -- Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

Question 15 is an open-ended response.

1. One reason for providing internships is for pre-hire investigation of companies.
2. Internships provide insight into students' abilities.
3. Internships provide increased self-esteem of students.
4. Student performance represents program strengths/weaknesses.
5. The deliverables required fairly represent the work accomplished.
6. Interactions of students and professionals are valuable.
7. The internship experience is a positive experience.
8. I would recommend internship to other construction education programs.
9. The school provides enough guidance for students to be successful.
10. The school provided enough guidance for employers to be helpful to students.
11. The length of this internship program is appropriate.
12. The internship experiences help students in subsequent academic performance.
13. Internship opportunities provide students clarification of career choices.
14. The internship experience gives students the opportunity to synthesize classroom knowledge into practical applications.
15. List other qualities that you would identify as valuable in an internship: \_\_\_\_\_

## STUDENT SURVEY

**Directions:** Same as the School Survey and Company Survey.

**PART ONE - This part of the survey describes current internship programs.**

1. Did your school "require" internship as part of the curriculum for graduation?  
Yes                      No

2. Did you participate in an internship program before graduation?  
Yes                      No

3. What length of program was required?  
0 weeks  
5 weeks  
10 weeks  
15 weeks  
>15 weeks  
Other

4. If other, please describe: \_\_\_\_\_

5. Was your internship paid?

Yes                      No

6. What is the name of your university construction education program?

7. What degree is offered in construction?

8. What is the name of the construction major?

9. How many tuition credit hours did you pay for the internship experience?

None

3 hours

6 hours

>6 hours

10. Upon graduation, were you hired by the internship supervising employer?

Yes                      No

11. If not, were you hired by another construction company?

Yes                      No

12. If not, were you hired by another type of company?

Yes                      No

If yes, please describe the type:

13. What deliverables are required in your internship program? (check all that apply)

None

Daily Logs

Organizational Charts

Formal Planned Goals & Objectives

Final Report

Student Evaluations - Midterm and Final

Supervisor Evaluations- Midterm and Final

Contact Sheet for Employment Supervisor

Academic supervisor site visit w/student

Academic supervisor site visit w/employer

14. Did you seek employment after graduation?

Yes                      No

15. Did an academic internship supervisor make site visitation (s)?

Yes                      No

16. The number of hours I worked per week?

Less than 40 hours per week

Average of 40 hours per week

More than 40 hours per week

17. The environment that I worked in (check all that apply)  
Headquarters  
Office  
Jobsite Trailer  
Field

**PART TWO - This part of the survey asks you to rate the following qualities of the internship experience:**

Questions 1-12 have these responses -- Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree  
Question 13 is an open-ended response.

1. The experience gained during the internship is valuable to me.
2. The internship experience helped to clarify my career choices.
3. Classroom knowledge was utilized during my internship experience.
4. The deliverables required fairly represented the work accomplished.
5. Interactions with professionals was valuable.
6. The internship experience was a positive experience for me.
7. I would recommend my internship employer to other students.
8. The school provides enough guidance for students to be successful.
9. The school provided enough guidance for employers to be helpful to students.
10. The length of this internship program was appropriate.
11. The internship experiences helped me in subsequent academic performance.
12. The internship experience gave me the opportunity to synthesize classroom knowledge into practical applications.
13. List other qualities that you would identify as valuable in an internship:

## COMPANY SURVEY

**Directions:** Same as School Survey and Student Survey.

**PART ONE - This part of the survey describes current internship experiences.**

1. Do you presently have a student internship program?

Yes                      No

2. Do you pay internship participants?

Yes                      No

3. What length internship programs do you presently supervise? (check all that apply)

0 weeks

5 weeks

10 weeks

15 weeks

>15 weeks

Other

4. If other, please describe:

5. Do you have personnel dedicated to the administration of an internship program?

Yes                      No

6. Do you hire graduates primarily from one university?

Yes                      No

7. If yes, please give name of university:

8. If you hire from many university programs, please list names:

9. Do you presently attend construction education career fairs?

Yes                      No

10. Are you a member of an Industry Advisory Committee for a university?

Yes                      No

11. If yes, please give name(s) of university:

12. Did academic internship supervisors make site visitation(s)?

Yes                      No

13. What deliverables are required in your internship program? (check all that apply)

None

Daily Logs

Organizational Charts

Formal Planned Goals & Objectives

Final Report

Student Evaluations - Midterm and Final

Supervisor Evaluations- Midterm and Final

Contact Sheet for Employment Supervisor

Academic supervisor site visit w/student

Academic supervisor site visit w/employer

14. How many times a year do you attend career fairs?

None

One to Two Times a Year

More Than Two Times a Year

15. The appropriate length of an internship program "should" be (in your opinion)?

0 weeks

5 weeks

10 weeks

15 weeks

>15 weeks

Other

16. If Other, please describe:

**PART TWO - This part of the survey asks you to rate the following qualities of the internship experience:**

Questions 1-13 have these responses -- Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree  
Question 14 is an open-ended response.

1. One reason for providing internships is for pre-hire investigation of students.
2. Internships provide insight into students' abilities.
3. Internships increase self-esteem or confidence of students.
4. Student performance represents university program strengths/weaknesses.
5. The deliverables required fairly represent the work accomplished.
6. Interactions of students and professionals are valuable.
7. The internship experience is a positive experience.
8. I would recommend internship to other construction companies.
9. The school provides enough guidance for students to be successful.
10. The school provided enough guidance for employers to be helpful to students.
11. The internship provides a vehicle to encourage employment with this company.
12. Internship opportunities provide students clarification of career choices.
13. The internship experience gives students the opportunity to synthesize classroom knowledge into practical applications.
14. List other qualities that you would identify as valuable in an internship:

## APPENDIX B

**CONSTRUCTION EDUCATION INTERNSHIP SURVEY****School Survey - Participant Information****INSTRUCTIONS**

Participant personal information provided herein, will not be shared with anyone. Please answer all questions in the appropriate manner. Return your completed survey in the self-addressed envelope provided. Thank you for your participation.

Participating University: \_\_\_\_\_

College Affiliation: \_\_\_\_\_

Program Emphasis: \_\_\_\_\_

Your Title: \_\_\_\_\_

Phone number: \_\_\_\_\_ Extension: \_\_\_\_\_

Today's Date: \_\_\_\_\_

Name: \_\_\_\_\_

First

Middle Initial

Last

E-Mail Address: \_\_\_\_\_

Gender:  Male  Female

Participant Type:  School  Student  Construction Employer

**SCHOOL SURVEY****PART ONE - This part of the survey describes current internship programs.**

1. Does your school "require" internship as part of the curriculum for graduation?

Yes  No

2. Does your school "encourage" an internship or experiential component?

Yes  No

3. What length of program do you require?

- 0 weeks  
 5 weeks  
 10 weeks  
 15 weeks  
 >15 weeks  
 Other

4. If other, please describe: \_\_\_\_\_



5. How many construction majors do you have presently enrolled in your construction program?

- < 50  
 50 to 100  
 101 to 200  
 >200

6. What is the name of your construction education program? \_\_\_\_\_

7. What degree is offered in construction? \_\_\_\_\_

8. What is the name of the construction major? \_\_\_\_\_

9. How many tuition credit hours do students pay for their internship experience?

- None  
 3 hours  
 6 hours  
 >6 hours

10. How many students were enrolled in your internship program:

- Spring 2003? \_\_\_\_\_  
 Summer I 2003? \_\_\_\_\_  
 Summer II 2003? \_\_\_\_\_  
 Entire Summer? \_\_\_\_\_  
 Fall 2003? \_\_\_\_\_

11. Can you provide a list of students that participated in any of the above sessions?

- Yes       No

12. Will you encourage students to participate in a student survey concerning their internship experiences?

- Yes       No

13. What deliverables are required in your internship program? (check all that apply)

- None  
 Daily Logs  
 Organizational Charts  
 Formal Planned Goals & Objectives  
 Final Written Report  
 Student Evaluations - Midterm and Final  
 Supervisor Evaluations- Midterm and Final  
 Contact Sheet for Employment Supervisor  
 Academic supervisor site visit w/student  
 Academic supervisor site visit w/employer

14. Do you have faculty dedicated to the internship program?  
 Yes       No
15. Does an academic internship supervisor make site visitation (s)?  
 Yes       No
16. Does the school provide internships?  
 Yes       No
17. Does the school provide a list of prospective employers for internship?  
 Yes       No
18. Does the construction program provide a career fair for students to make contacts for future employment/internship opportunities?  
 Yes       No
19. How many times a year do you have a career fair?  
 None       One       Two
20. Does your construction program have an industry advisory committee?  
 Yes       No
21. How many students graduated from the construction program:  
 Spring 2003? \_\_\_\_\_  
 Summer 2003? \_\_\_\_\_  
 Fall 2003? \_\_\_\_\_
22. Do you allow students to be paid by internship employers?  
 Yes       No

**PART TWO - This part of the survey asks you to rate the degree to which you agree or disagree with statements concerning the internship experience:**

Questions 1-14 have these responses:

0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree

Question 15 is an open-ended response.

1. One reason for providing internships is for pre-hire investigation of companies.  
 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree
2. Internships provide insight into students' abilities.  
 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

3. Internships provide increased self-esteem of students.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

4. Student performance represents program strengths/weaknesses.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

5. The deliverables required fairly represent the work accomplished.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

6. Interactions of students and professionals are valuable.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

7. The internship experience is a positive experience.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

8. I would recommend internship to other construction education programs.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

9. The school provides enough guidance for students to be successful.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

10. The school provided enough guidance for employers to be helpful to students.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

11. The length of this internship program is appropriate.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

12. The internship experiences help students in subsequent academic performance.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

13. Internship opportunities provide students clarification of career choices

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

14. The internship experience gives students the opportunity to synthesize classroom knowledge into practical applications.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

15. List other qualities that you would identify as valuable in an internship:

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THANK YOU for your participation.

Please return your survey in the self-addressed envelope provided.

If you have questions, contact Cassandra Hager at [cassandra\\_hager@neo.tamu.edu](mailto:cassandra_hager@neo.tamu.edu)  
or call 512-845-6435  
or contact Dr. John A. Bryant, Committee Chair, at [jbryant@esl.tamu.edu](mailto:jbryant@esl.tamu.edu) or call 979-845-1017

## CONSTRUCTION EDUCATION INTERNSHIP SURVEY

### Company Survey - Participant Information

**INSTRUCTIONS** - Participant personal information provided herein, will not be shared with anyone.

Return your completed survey in the self-addressed envelope provided. Thank you for your participation.

Participating Company: \_\_\_\_\_

Industry Emphasis: \_\_\_\_\_

(ie. Heavy Highway, Residential, Commercial, Industrial, Power, etc)

Annual Contract Sales: \_\_\_\_\_

Your Title: \_\_\_\_\_

Phone number: \_\_\_\_\_ Extension: \_\_\_\_\_

Name: \_\_\_\_\_

First

Middle Initial

Last

E-Mail Address: \_\_\_\_\_

Gender:  Male  Female

Participant Type:  School  Student  Construction Employer

## COMPANY SURVEY

**PART ONE - This part of the survey describes current internship experiences.**

1. Do you presently provide a student internship program at your company?

Yes  No

2. Are students paid during their internship experience with your company?

Yes  No

3. What length of internship experience(s) do you supervise? (check all that apply)

- 0 weeks
- 5 weeks
- 10 weeks
- 15 weeks
- >15 weeks
- Other

4. If other, please describe: \_\_\_\_\_

5. The appropriate length of an internship experience "should" be (in your opinion)?

- 5 weeks  
 10 weeks  
 15 weeks  
 >15 weeks  
 Other

6. If other, please describe: \_\_\_\_\_

7. Do you have personnel dedicated to the administration of an internship program?

- Yes       No

8. Do you hire graduates primarily from one university?

- Yes       No    9. If yes, please list: \_\_\_\_\_

10. If you hire from several university programs please list:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

11. Does your company presently attend university career fairs?

- Yes       No

12. If yes, how many does your company attend in a year? \_\_\_\_\_

13. Is your company a member of an industry advisory committee for a university construction program?

- Yes       No

14. If yes, please list name(s) of universities:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

15. What deliverables are required by the interns being supervised? (check all that apply)

- None  
 Daily Logs  
 Organizational Charts  
 Formal Planned Goals & Objectives  
 Final Written Report

- Student Evaluations - Midterm and Final
- Supervisor Evaluations- Midterm and Final
- Contact Sheet for Employment Supervisor
- Academic supervisor site visit w/student
- Academic supervisor site visit w/employer

16. Does an "academic" internship supervisor make site visitation (s) during the internship experience?

- Yes       No

**PART TWO - This part of the survey asks you to rate the degree to which you agree or disagree with statements concerning the internship experience:**

Questions 1-13 have responses: 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree. Question 14 is an open-ended response.

1. One reason for providing internships is for pre-hire investigation of companies.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

2. Internships provide insight into students' abilities.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

3. Internships provide increased self-esteem of students.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

4. Student performance represents university program strengths/weaknesses.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

5. The deliverables required fairly represent the work accomplished.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

6. Interactions of students with professionals are considered valuable.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

7. The internship experience is a positive experience.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

8. I would recommend internship to other construction companies.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

9. The schools provide enough guidance for students to be successful.

- 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

10. The schools provided enough guidance for employers to be helpful to students.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

11. The internship provides a vehicle to encourage employment with this company.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

12. Internship opportunities provide students clarification of career choices

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

13. The internship experience gives students the opportunity to synthesize classroom knowledge into practical applications.

1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree

14. List other qualities that you would identify as valuable in an internship:

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THANK YOU for your participation.

Please return your survey in the self-addressed envelope provided.

If you have questions, contact Cassandra Hager at [cassandra\\_hager@neo.tamu.edu](mailto:cassandra_hager@neo.tamu.edu)  
or call 512-845-6435  
or contact Dr. John A. Bryant, Committee Chair, at [jbryant@esl.tamu.edu](mailto:jbryant@esl.tamu.edu) or call 979-845-1017



## CONSTRUCTION EDUCATION INTERNSHIP SURVEY

### Student Survey - Participant Information

#### INSTRUCTIONS

Participant personal information provided herein, will not be shared with anyone. Please answer all questions in the appropriate manner. Return your completed survey in the self-addressed envelope provided. Thank you for your participation.

Participating University: \_\_\_\_\_

Classification: \_\_\_\_\_

Major: \_\_\_\_\_

Name: \_\_\_\_\_

First

Middle Initial

Last

E-Mail Address: \_\_\_\_\_

Gender:             Male             Female

Participant Type:     School             Student             Construction Employer

## STUDENT SURVEY

### **PART ONE - This part of the survey describes current internship programs.**

1. Does your school "require" internship as part of the curriculum for graduation?

Yes             No

2. Does your school "encourage" an internship or experiential component?

Yes             No

3. Did you participate in an internship program before graduation?

Yes             No

4. What length of internship does your program require?

- 0 weeks
- 5 weeks
- 10 weeks
- 15 weeks
- >15 weeks
- Other

5. If other, please describe: \_\_\_\_\_

6 Was your internship paid by the construction employer?

- Yes       No

7. How many tuition credit hours do students pay for their internship experience?

- None  
 3 hours  
 6 hours  
 >6 hours  
 Other

8. Upon graduation, does the internship supervising employer want to hire you?

- Yes       No

9. If not, does another construction company want to hire you?

- Yes       No

10. If not, will you go to work in another field?

- Yes       No

11. If you have been hired by another type of company, please describe: \_\_\_\_\_

12. Will you seek employment after graduation?

- Yes       No

13. What deliverables are required in your internship program? (check all that apply)

- None  
 Daily Logs  
 Organizational Charts  
 Formal Planned Goals & Objectives  
 Final Written Report  
 Student Evaluations - Midterm and Final  
 Supervisor Evaluations- Midterm and Final  
 Contact Sheet for Employment Supervisor  
 Academic supervisor site visit w/student  
 Academic supervisor site visit w/employer

14. Did dedicated faculty supervise the internship experience?

- Yes       No

15. Does an academic internship supervisor make site visitation (s)?

- Yes       No

16. Did the school provide internships or did you have to acquire it on your own?  
 Provided     Own
17. Did the school provide a list of prospective employers for internship?  
 Yes     No
18. Does the construction program provide a career fair for students to make contacts for future employment/internship opportunities?  
 Yes     No
19. Does your school have a career fair that provides opportunities for employment/internship?  
 Yes     No
20. Did you find your internship by attending a career fair?  
 Yes     No
21. The number of hours I worked per week during my internship experience:  
 Less than 40 hours per week  
 An average of 40 hours per week  
 More than 40 hours per week
22. The environment that I worked in (check all that apply):  
 Headquarters  
 Office  
 Jobsite Trailer  
 Field  
 Other: (describe) \_\_\_\_\_

**PART TWO - This part of the survey asks you to rate the degree to which you agree or disagree with statements concerning the internship experience:**

Questions 1-14 have these responses:

0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree

Question 15 is an open-ended response.

1. One reason for providing internships is for pre-hire investigation of companies.  
 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree
2. The experience gained during the internship was valuable to me.  
 1 = Strongly Disagree     2 = Disagree     3 = Neutral     4 = Agree     5 = Strongly Agree

3. The internship experience helped me to clarify my career choices.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
4. The internship experience gave me the opportunity to synthesize classroom knowledge into practical application.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
5. The deliverables required fairly represent the work accomplished.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
6. The interactions of students with professionals during the internship are valuable.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
7. The internship experience was a positive experience for me.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
8. I would recommend internship to other students of construction education programs.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
9. I would recommend my internship construction employer to other students.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
10. Internships provide students increased self-esteem or self-confidence.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
11. The school provided enough guidance for students to be successful during their internships.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
12. The school provided enough guidance for employers to be helpful to students.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
13. The length of this internship experience is appropriate.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
14. The internship experiences helped me in subsequent academic performance.  
 1 = Strongly Disagree    2 = Disagree    3 = Neutral    4 = Agree    5 = Strongly Agree
15. List other qualities that you would identify as valuable in an internship:

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THANK YOU for your participation.

Please return your survey in the self-addressed envelope provided.

If you have questions, contact Cassandra Hager at [cassandra\\_hager@neo.tamu.edu](mailto:cassandra_hager@neo.tamu.edu)  
or call 512-845-6435  
or contact Dr. John A. Bryant, Committee Chair, at [jbryant@esl.tamu.edu](mailto:jbryant@esl.tamu.edu) or call 979-845-1017

## APPENDIX C

**E-Mail Cover Letter for Internet-based School Survey:**

Dear Professor,

My name is Cassandra Jane Tiner Hager. I am a Ph.D. candidate at Texas A&M University in the College of Architecture (with emphasis in Construction Science). As part of my dissertation, I am surveying university undergraduate construction education programs, university internship supervisors, students, and construction industry representatives for their perceptions of the internship experience.

I am seeking your voluntary participation in a survey that will help describe the current situation of university undergraduate construction education internship programs in the United States. I am asking the schools of the Associated Schools of Construction (approximately 92) to participate. The purpose of this research is to further the body of knowledge in the construction education field.

**If you are not familiar with your school's construction education internship program or another faculty member would be a more appropriate respondent, please forward this e-mail to the appropriate faculty member or reply to this investigator with new contact information.**

When you gain access to the survey website you will first be directed to a "Participant Survey" form, where program information such as University, College Affiliation, Name of Program, and Program Emphasis will be collected. Additional participant information will include name, gender, e-mail address and participant type (i.e. school). This information is necessary to provide you with the correct survey instrument. The information provided will not be shared with anyone. The only reason for asking for this information is so that the database may check for participant duplications. The only intent is to keep participants from participating in the survey more than once. Upon completion of participant survey, you will be provided with a two-part questionnaire. Part One describes your current internship program, while Part Two asks you to rate the following qualities of the internship experience (from an academic supervisor perspective).

The survey should take approximately 20 minutes to complete. If at any time you need to exit the survey without finishing, you will be allowed to submit your partial survey as temporary records. Through a username and password sequence, you will be allowed access to finish the survey.

You may refuse to answer any questions and still participate fully in the study without consequence. You may withdraw from the study at any time. The study is confidential with coded responses. Storage of the questionnaire database is hosted on a secure server.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand that by voluntarily going to the URL address ([actual address will go here](#)), I am consenting to participate in this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

If you have questions, please do not hesitate to contact Cassandra Hager at  
cassandra\_hager@neo.tamu.edu or call 512-845-6435  
or contact Dr. John A. Bryant, Committee Chair, at jbryant@esl.tamu.edu or call 979-845-1017

**E-Mail Cover Letter for Internet-based Student Survey:**

Dear Student,

My name is Cassandra Jane Tiner Hager. I am a graduate student at Texas A&M University working on a Ph.D. in the College of Architecture (with emphasis in Construction Science). As part of my research I am surveying university undergraduate construction education programs with input from internship academic supervisors, students, and construction industry supervisors for their perceptions of the internship experience.

I am seeking your voluntary participation in a survey that will help describe the current situation of university undergraduate construction education internship programs in the United States. I am asking students of the approximately 200 schools of the Associated Schools of Construction, that have participated in an internship program, to participate. The purpose of this research is to further the body of knowledge in the construction education field.

When you gain access to the survey website you will first be directed to a "Participant Survey" form, where program information such as Participating University, Classification, and Major, will be collected. Additional participant information will include name, gender, e-mail address and participant type (i.e. student). This information is necessary to provide you with the correct survey instrument. The information provided will not be shared with anyone. The only reason for asking for this information is so that the database may check for participant duplications. The only intent is to keep participants from participating in the survey more than once. Upon completion of participant survey, you will be provided with a two-part questionnaire. Part One describes your internship experience, while Part Two asks you to rate the following qualities of an internship experience (from a student perspective).

The survey should take approximately 20 minutes to complete. If at any time you need to exit the survey without finishing, you will be allowed to submit your partial survey as temporary records. Through a username and password sequence, you will be allowed access to finish the survey.

You may refuse to answer any questions and still participate fully in the study without consequence. You may withdraw from the study at any time. The study is confidential with coded responses. Storage of the questionnaire database is hosted on a secure server.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand that by voluntarily going to the URL address ([actual address will go here](#)), I am consenting to participate in this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

If you have questions, please do not hesitate to contact Cassandra Hager at  
cassandra\_hager@neo.tamu.edu or call 512-845-6435  
or Dr. John A. Bryant, Committee Chair, at jbryant@esl.tamu.edu or call 979-845-1017

**E-Mail Cover Letter for Internet-based Company Survey:**

Dear Construction Internship Supervisor,

My name is Cassandra Jane Tiner Hager. I am a graduate student at Texas A&M University working on a Ph.D. in the College of Architecture (with emphasis in Construction Science). As part of my research I am surveying university undergraduate construction education programs with input from internship academic supervisors, students, and construction industry internship supervisors for their perceptions of the internship experience.

I am seeking your voluntary participation in a survey that will help describe the current situation of university undergraduate construction education internship programs in the United States. I am asking approximately 200 construction internship supervisors to participate. The purpose of this research is to further the body of knowledge in the construction education field.

When you gain access to the survey website you will first be directed to a "Participant Survey" form, where information such as Participating Company, Industry Emphasis, Annual Contract Sales, Job Title, Phone number and extension, will be collected. Additional participant information will include name, gender, e-mail address and participant type (i.e. company). This information is necessary to provide you with the correct survey instrument. The information provided will not be shared with anyone. The only reason for asking for this information is so that the database may check for participant duplications. The only intent is to keep participants from participating in the survey more than once. Upon completion of participant survey, you will be provided with a two-part questionnaire. Part One describes your internship experience, while Part Two asks you to rate the following qualities of an internship experience (from a supervisor perspective).

The survey should take approximately 20 minutes to complete. If at any time you need to exit the survey without finishing, you will be allowed to submit your partial survey as temporary records. Through a username and password sequence, you will be allowed access to finish the survey.

You may refuse to answer any questions and still participate fully in the study without consequence. You may withdraw from the study at any time. The study is confidential with coded responses. Storage of the questionnaire database is hosted on a secure server.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand that by voluntarily going to the URL address ([actual address will go here](#)), I am consenting to participate in this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

If you have questions, please do not hesitate to contact Cassandra Hager at  
cassandra\_hager@neo.tamu.edu or call 512-845-6435  
or Dr. John A. Bryant, Committee Chair, at jbryant@esl.tamu.edu or call 979-845-1017



# **\*ATTENTION\***

Students who have recently participated in a  
Construction INTERNSHIP experience.

A research study of Construction Education Internship Programs  
is being conducted  
by Cassandra Hager, a Ph.D. Candidate at Texas A&M University.

Would you like to provide input?  
Your Student Perspective is important to this study.

Please e-mail: [ch18@txstate.edu](mailto:ch18@txstate.edu)

Your voluntary participation in a short e-mail survey is needed.  
Request your survey instrument be sent to your official school  
e-mail address today!

All you do is mark your responses and reply!

The purpose of this study is to describe the internship programs currently administered in U.S. university undergraduate construction education programs. Additionally, this research will compile the perceptions of faculty, students, and construction supervisors with regard to the internship experience.

There is no compensation for participation in this survey. The survey will take approximately 20 minutes to finish. A secure database will be hosted by Texas A&M University. Responses will be coded to ensure confidentiality of results.

If you have questions, please do not hesitate to contact Cassandra Hager at  
[cassandra\\_hager@neo.tamu.edu](mailto:cassandra_hager@neo.tamu.edu) or call 512-845-6435  
or contact Dr. John A. Bryant, Committee Chair, at [jbryant@esl.tamu.edu](mailto:jbryant@esl.tamu.edu) or call 979-845-1017

**Student Survey -- Recruitment Informational E-Mail Letter**

Dear Professor,

First, I would like to thank you for your participation in the Construction Education Internship Survey.

I was amazed at the number of participants that responded to the School Survey. The information you provided is very important to this study.

As a participant, you responded that you might be able to provide a list of students that have recently participated in an internship (Spring, Summer or Fall 2003). I am ready to conduct the Student Survey and need your help in acquiring my student participants.

I have two thoughts on how to gain student participation:

1) I can e-mail YOU the Student Survey (e-mail version) and you can then utilize your list of students to "FORWARD" the survey to their official school e-mail addresses. The students can "Reply" to MY e-mail address, and upon completion of the survey instrument, "SEND" it back to me!

(That way I only get e-mail from students that have voluntarily responded to the survey.)

OR,

2) You can e-mail ME the List of Students (their official school e-mail addresses). I will then e-mail each student the Student Survey (e-mail version) and they can "Reply" to me after completion of the instrument.

I have tested both methods and have found that regardless of the method, the e-mail must be received and sent from a university e-mail address or the survey information is truncated. Yahoo, Hotmail, etc. DO NOT WORK!

I have provided an example of the e-mail survey instrument and the letter of consent. Please see the Attachments: Letter of Consent\_Student Survey and E-mail Survey\_Student

I hope you will consider helping me to acquire my student participants.

Mrs. Cassandra Hager  
Lecturer, Texas State University-San Marcos, TX  
Ph.D. Candidate, TAMU-College Station, jTX  
512-845-6435

## School Survey -- Study Information Sheet

### TEXAS A&M UNIVERSITY Department of Construction Science

#### Construction Education Internship Survey

Dear Professor,

I am Cassandra Jane Tiner Hager, a Ph.D. candidate at Texas A&M University in the College of Architecture (with emphasis in Construction Science). As part of my dissertation, I am surveying university undergraduate construction education programs, university internship supervisors, students, and construction industry representatives for their perceptions of the internship experience.

I am seeking your voluntary participation in a survey that will help describe the current situation of university undergraduate construction education internship programs in the United States. I am asking the schools of the Associated Schools of Construction (approximately 92) to participate. The purpose of this research is to further the body of knowledge in the construction education field and to develop a set of standards or best-practices guidelines for structuring construction education internship programs.

**If you are not familiar with your school's construction education internship program or another faculty member would be a more appropriate respondent, please forward this e-mail to the appropriate faculty member or reply to this investigator with new contact information.**

INSTRUCTIONS: Please open the attached file "School Survey", provide your responses, re-save the file, reply to this e-mail and attach your new file. The "Participant Survey" form gathers program information such as University, College Affiliation, Name of Program, and Program Emphasis. Additional participant information will include name, gender, e-mail address and participant type (i.e. school). This information is necessary to prevent participant duplications. The "School Survey" is a two-part questionnaire. Part One describes your current internship program, while Part Two asks you to rate the following qualities of the internship experience (from an academic supervisor perspective).

The survey should take approximately 20 minutes to complete.

You may refuse to answer any questions and still participate fully in the study without consequence. You may withdraw from the study at any time. The study is confidential with coded responses. Storage of the questionnaire database is hosted on a secure server.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand that by replying to this e-mail and attaching the file with my responses, I am consenting to participate in this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

If you have questions, please do not hesitate to contact Cassandra Hager at  
cassandra\_hager@neo.tamu.edu or call 512-845-6435  
or contact Dr. John A. Bryant, Committee Chair, at jbryant@esl.tamu.edu or call 979-845-1017

## Student Survey – Study Information Sheet

### TEXAS A&M UNIVERSITY - Department of Construction Science Construction Education Internship Survey

Dear Student,

My name is Cassandra Jane Tiner Hager. I am a Ph.D. candidate at Texas A&M University in the College of Architecture (with emphasis in Construction Science). As part of my dissertation, I am surveying university undergraduate construction education programs, university internship supervisors, **students**, and construction industry representatives for their **perceptions of the internship experience**.

I am seeking your voluntary participation in a survey that will help describe the current situation of university undergraduate construction education internship programs in the United States.

Approximately 200 students are being surveyed. The Associated Schools of Construction (ASC) programs were asked to provide a list of e-mail addresses or forward this e-mail to students that have recently worked as an intern in the construction industry (Spring, Summer or Fall 2003).

The purpose of this research is to further the body of knowledge in the construction education field and to develop a set of standards or best-practice guidelines for structuring construction education internship programs.

A “Participant Survey” form, where program information such as Participating University, Classification, and Major, will be collected. Additional participant information will include name, gender, e-mail address and participant type (i.e. student). The information provided will not be shared with anyone. The only reason for asking for this information is so that the database may check for participant duplications. The only intent is to keep participants from participating in the survey more than once. Upon completion of participant survey, you will be provided with a two-part questionnaire. Part One describes your internship experience, while Part Two asks you to rate the following qualities of an internship experience (from a student perspective).

The survey should take approximately 20 minutes to complete. You may refuse to answer any questions and still participate fully in the study without consequence. You may withdraw from the study at any time. The study is confidential with coded responses. Storage of the questionnaire database is hosted on a secure server. *Please take the time to read the following:*

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand that by voluntarily replying to the provided e-mail survey, I am consenting to participate in this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects Research, Texas A&M University. For research-related problems or questions regarding subjects’ rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

If you have questions, please do not hesitate to contact Cassandra Hager at [cassandra\\_hager@neo.tamu.edu](mailto:cassandra_hager@neo.tamu.edu) or call 512-845-6435 or contact Dr. John A. Bryant, Committee Chair, at [jbryant@esl.tamu.edu](mailto:jbryant@esl.tamu.edu) or call 979-845-1017

## Company Survey – Study Information Sheet

### TEXAS A&M UNIVERSITY Department of Construction Science

#### CONSTRUCTION EDUCATION INTERNSHIP SURVEY

Dear Construction Internship Supervisor,

My name is Cassandra Jane Tiner Hager. I am a Ph.D. candidate at Texas A&M University in the College of Architecture (with emphasis in Construction Science). As part of my dissertation, I am surveying university undergraduate construction education programs, students, and construction industry representatives for their perspectives concerning construction internship experiences.

I am seeking your voluntary participation in a survey that will help describe the current situation of university undergraduate construction education internship programs in the United States. I am asking approximately 200 construction industry internship supervisors to participate. The purpose of this research is to further the body of knowledge in the construction education field.

**If you are not familiar with whether your company has an internship program or another company representative would be a more appropriate respondent, please forward this survey to the appropriate person or reply to this investigator with new contact information.**

Participant information will be collected. The participant information provided will **not** be shared with anyone. This information is necessary so that the database may check for company participant duplications, and to stratify information by size and type of companies. The study includes a two-part questionnaire: Part One describes current internship experiences, while Part Two asks you to rate the following qualities of an internship experience (from a supervisor or construction industry perspective). *Your industry perspective is very important to this study.*

The survey should take approximately 20 minutes to complete. You may refuse to answer any questions and still participate fully in the study without consequence. The study is confidential with coded responses. Storage of the questionnaire database is hosted on a secure server. *Please take the time to read the following:*

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. By returning this survey in the provided envelope, I am consenting to participate in this study.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

If you have questions, please do not hesitate to contact Cassandra Hager at [cassandra\\_hager@neo.tamu.edu](mailto:cassandra_hager@neo.tamu.edu) or call 512-845-6435 or contact Dr. John A. Bryant, Committee Chair, at [jbryant@esl.tamu.edu](mailto:jbryant@esl.tamu.edu) or call 979-845-1017

If you would prefer to respond to an electronic version of this survey, please e-mail me and I will send an e-mail version to you.

## APPENDIX D

## Matrix of Findings – The Pilot Study

<b>Key components of internship programs in four domain areas:</b>					
<b>Variables</b>	<b>Business</b>	<b>Political Science</b>	<b>Allied Health Professions</b>	<b>Teacher Preparation</b>	<b>Construction Education</b>
Accreditation Agency	AACSB	No	CAAHEP	NCATE	ACCE, ABET, NAIT
Experiential Learning Nomenclature	Intern	Intern	Clinical Lab Clinical Practice Internship	Field Experience Student Teacher Clinical Practice Internship	Intern
Required	Required	Optional	Required	Required <sup>7,8</sup>	Yes <sup>11</sup> /No <sup>9</sup>
Optional	Yes	Yes			Yes <sup>11</sup> /No <sup>9</sup>
Course Credit Standards for Internship Program Structure	Yes/No <sup>3</sup>	Yes <sup>1</sup>	Yes <sup>7,8</sup> Discipline Specific	Yes <sup>7,8</sup> NCATE, ATE	Yes/No
Certification Exam/Licensure	CPA CMA		Board of Examiners (each discipline)	ExCET in TX (each State)	AIC
Required for Graduation	No	No	Yes	No	No
Optional for Graduation	Yes		No	Yes	Yes
Required for Employment	No	No	Yes	Yes	No
Internship (Can be PAID) Partnerships	Yes	Yes	No	No	Yes <sup>11</sup>
			Healthcare facilities, Organizations, or Agencies	Schools <sup>7</sup>	Yes <sup>10,11</sup>
Placement Provided	No	No	Yes	Yes <sup>7,8</sup>	No <sup>9,11</sup>
Selected University Faculty	Yes <sup>3</sup>	Yes <sup>1,5</sup>	Yes <sup>6</sup>	Yes <sup>7,8</sup>	Yes <sup>9</sup>
Selected Cooperating Supervisor	Yes	Yes	Yes <sup>6</sup>	Yes <sup>7,8</sup>	No
Special Training University Supervisor	Yes <sup>4</sup>	No	Yes	Yes <sup>7,8</sup>	No
Special Training Cooperating Supervisor University Supervisor Site Visit	Yes <sup>4</sup>	No	Yes <sup>6</sup>	Yes <sup>7,8</sup>	No
Required	No	Yes <sup>5</sup>	Yes <sup>6</sup>	Yes <sup>7,8</sup>	Yes <sup>11</sup> /No
Optional	Yes	Yes	Yes	No	Yes

## Matrix of Findings – The Pilot Study (continued)

Variables	Business	Political Science	Allied Health Professions	Teacher Preparation	Construction Education
Evaluation of Internship Required			Each discipline requirements		
Self Evaluation				Yes7,8	Yes11/No
Coop. Sup Eval.	Yes2		Yes6	Yes7,8	Yes11/No
Univ. Sup. Eval.	Yes2	Yes5	Yes6	Yes7,8	Yes11/No
Written Report	Yes2	Yes/No		Yes/No	Yes11/No
Daily Logs	Yes2			No	Yes
Portfolio				Yes7,8	Yes11/No
Written Reflections/ Perceptions	Yes2,3	Yes1	No	Yes7,8	Yes11/No
Industry Advisory Council					
Required	No	No	Yes6	Yes7,8	
Optional	Yes	Yes			Yes11
Collaboration of Univ. w/Triad	Yes3	Yes1,5	Yes6	Yes7,8	Yes10,11
Collaboration on Internship Structure and Improvement	No	Yes1	Yes6	Yes7,8	Yes10,11
Promotes Work in Diverse Populations	Yes3	Yes	Yes6	Yes7,8	No
Context chosen For Student	No	No	Yes/No	Yes7,8/No	No9,10,11
Context Diverse	Yes3,4	Yes	Yes6	Yes7,8	Yes11
Continuous Triad Communication	No	Yes1,5	Yes6	Yes7,8	Yes11
Sequencing of Internship	Jr.3	Jr.	Jr./Sr.	Jr./Sr.7,8	Jr.11
Adequate Funding for Administration	No	Yes1	Yes6	Yes7,8	Yes/No
Length of Internship	None Summer Long Semester	1 month 2 months Summer Long Semester	Long Semester	Long Semester	None Summer Long Semester

1. Hirschfield, R. &amp; Adler, N. (1973)

2. Moriber, A. C. (1996)

3. Smith, C. A. (1964)

4. Lowe, R. E. (1965)

5. Hedlund, R. D. (1973)

6. CAAHEP Accreditation Standards (2003)

7. NCATE Standard 3: Field Experiences and Clinical Practice (1995)

8. ATE Standards for Field Experience in Teacher Education (2000)

9. Senior, B. A (1997)

10. Adcox, J.W. (2000)

11. Marshall, J. A. (1999)

## APPENDIX E

**Tabulation of the Results for Subproblem One and Two*****Subproblem One -- Tabulation of the Results***

School Survey -- Part One. This part of the study describes current construction education internship programs.

In describing the school survey population, of the 92 schools in the original e-mail list of Associated Schools of Construction (ASC) Schools, one school was excluded from the population because the school only provided a graduate degree and one school was excluded because the school only provided a two-year program. Of these 90 schools, 60 schools responded to this investigator (66.7%). Of these 60 schools, four participants were unable to access the internet-based survey, nor responded to the other methods of survey, and therefore did not participate. To gain additional participation, an alternate e-mail version of the survey instrument was sent, with nine schools responding; and finally a paper-based version was mailed, with twenty schools responding. In the end, 54 schools completed survey instruments (60%); two participants e-mailed this investigator saying they wanted to be included in the study as responding that they do not require, nor encourage a formal internship in their programs; one respondent simply stated, "I do not complete surveys that can be traced to my name"; with the final study being based on 56 responses. This generated a response rate of 62%.



School Participant Information:

- All 56 participant schools are located within the United States.
- All 56 participant schools have four-year undergraduate construction education programs.
- The 56 participant schools are classified under approximately 29 different names for college or school affiliations.
- The 56 participant schools listed 19 different terms when asked for program emphasis. These terms have been categorized into the following 6 groups:
  - 25/56 (45%) said emphasis is Construction Management.
  - 9/56 (16%) said emphasis is Civil Engineering or Construction Engineering
  - 4/56 (7%) said emphasis is Building Construction or Building Science
  - 4/56 (7%) said emphasis is Commercial Construction or plain Construction
  - 5/56 (9%) said emphasis is Construction Science, Technology or Industrial Technology or Construction Management Technology
  - 9/56 (16%) did not fit in any other category, confused by the question or did not respond.

School Survey -- Part One. This part of the study describes current internship programs.

Does your school “require” internship as part of the curriculum for graduation?

Overall	Actual Responses	
25/56 (45%)	25/50 (50%)	Yes
22/56 (39%)	22/50 (44%)	No
3/56 (5%)	3/50 (6%)	hours required for “work” may be Coop, Internship or just work.
6/56 (11%)	No Response	

Does your school “encourage” an internship or experiential component in the curriculum?

Overall		Actual Responses	
40/56	(71.4%)	40/44 (91%)	Yes
4/56	(7.2%)	4/44 (9%)	No
12/56	(21.4%)		No Response

What length of internship does your program require?

Overall		Actual Responses	
8/56	(14%)	8/46 (17.4%)	1=None
2/56	(4%)	2/46 (4.3%)	2=5 Week
7/56	(12.5%)	7/46 (15.2%)	3=10 Week
10/56	(18%)	10/46 (21.7%)	4=15 Week
5/56	(9%)	5/46 (10.8%)	5=>15 Week
14/56	(25%)	14/56 (30.4%)	6=Other
10/56	(17.5%)		No Response

Descriptions of “Other” (Lengths of Internship required):

Voluntary, no fixed period.  
 Twenty-three days or 184 hours.  
 Two separate full semesters.  
 Two internships, 400 hours minimum (each).  
 Sometimes six months, depends on employer’s program.  
 500 hours minimum.  
 3 months full time or equivalent.  
 800 hours.  
 1000 hours.  
 16 weeks.  
 Minimum of 8 weeks at 20 hours per week.  
 Exactly 300 hours.

How many construction majors do you have presently enrolled in your construction program?

Overall		Actual Responses	
2/56	(3.5%)	2/48 (4%)	1=<50 majors
10/56	(18%)	10/48 (21%)	2=50 to 100 majors
14/56	(25%)	14/48 (29%)	3=101 to 200 majors
22/56	(39%)	22/48 (46%)	4=200+ majors
8/56	(14%)	56-8=48	No Response

What is the name of your construction education program?

(Similar responses to Program Emphasis question)

What degree is offered in construction?

Overall		Actual Responses	
2/56	(3.6%)	2/47	(4%) AS
43/56	(77%)	43/47	(91%) BS
1/56	(1.7%)	1/47	(2%) BA
1/56	(1.7%)	1/47	(2%) BBSCI
9/56	(16%)	56-9=47	No Response

What is the name of the construction major?

(Responses were similar to Program Emphasis – question was deemed worded poorly.)

How many tuition credit hours do students pay for their internship experience?

Overall		Actual Responses	
17/56	(30%)	17/46	(37%) 1=None
21/56	(38%)	21/46	(46%) 2=3 hours
4/56	(7%)	4/46	(8%) 3=6 hours
1/56	(1.7%)	1/46	(2%) 4=>6 hours
3/56	(5.3%)	3/46	(6.5%) Write-ins: (3 or 6 hrs, optional, and one hour).
10/56	(18)	56-10=46	No Response

How many students were enrolled in your internship program:

Spring 2003    Summer I 2003    Summer II 2003    Summer I & II    Fall 2003

*Asked for actual numbers of students per program per session.*

Can you provide a list of students that participated in any of the previous sessions of internship?

Overall		Actual Responses	
13/56	(23%)	13/47	(28%) Yes
34/56	(61%)	34/47	(72%) No
9/56	(16%)	56-9=47	No Response

Will you encourage students to participate in a student survey concerning their internship experiences?

Overall		Actual Responses	
33/56	(59%)	33/46 (72%)	Yes
12/56	(21%)	12/46 (26%)	No
1/56	(2%)	1/46 (2%)	I would need to review instrument.
10/56	(18%)	56-10=46	No Response

What deliverables are required?

13/56 (23%)	1= None
24/56 (43%)	2= Daily Logs
3/56 (5%)	3= Organizational Charts
16/56 (29%)	4= Formal Planned Goals and Objectives
32/56 (57%)	5= Final Written Report
12/56 (21%)	6= Student Evaluations - Midterm and Final
21/56 (37.5%)	7= Supervisor Evaluations - Midterm and Final
15/56 (27%)	8= Contact Sheet for Employment Supervisor
10/56 (18%)	9=Academic supervisor site visit with Student
8/56 (14%)	10=Academic supervisor site visit with Employer

Do you have faculty dedicated to the internship program?

Overall		Actual Responses	
22/56	(39%)	22/47 (47%)	Yes
24/56	(43%)	24/47 (51%)	No
1/56	(2%)	1/47 (2%)	Insufficient faculty resources, thus the zero credit course.
9/56	(16%)	56-9=47	No Response

Does an academic internship supervisor make site visitation(s)?

Overall		Actual Responses	
14/56	(25%)	14/47 (30%)	Yes
33/56	(59%)	33/47 (70%)	No
9/56	(16%)	56-9=47	No Response

Does the school "provide" internships?

Overall		Actual Responses	
9/56	(16%)	9/47 (19%)	Yes
38/56	(68%)	38/47 (81%)	No
9/56	(16%)	56-9=47	No Response

Does the school provide a list of prospective employers for internship?

Overall		Actual Responses	
36/56	(64%)	36/47 (77%)	Yes
11/56	(20%)	11/47 (23%)	No
9/56	(16%)	56-9=47	No Response

Does the construction program provide a career fair for students to make contacts for future employment/internship opportunities?

Overall		Actual Responses	
33/56	(59%)	33/48 (69%)	Yes
15/56	(27%)	15/48 (31%)	No, (two said the "University" does a provide career fair)
8/56	(14%)	56-8=48	No Response

How many times a year does the construction program have a career fair?

Overall		Actual Responses	
11/56	(20%)	11/47 (23%)	One career fair
14/56	(25%)	14/47 (30%)	Two career fairs
22/56	(39%)	22/47 (47%)	Three career fairs
9/56	(16%)	56-9=47	No Response

Does your construction program have an industry advisory committee?

Overall		Actual Responses	
46/56	(82%)	46/48 (96%)	Yes
2/56	(3.6%)	2/48 (4%)	No
8/56	(14.3%)	56-8=48	No Response

How many students graduated from the construction program in Spring 2003?

*Asked for actual numbers of students per program.*

How many students graduated from the construction program in Summer 2003?

*Asked for actual numbers of students per program.*

How many students do you anticipate to graduate from the construction program Fall 2003?

*Asked for actual numbers of students per program.*

Do you allow students to be paid by internship employers?

Overall	Actual Responses	
46/56 (82%)	46/46 (100%)	Yes
0/56 (0%)	0/46 (0%)	No
10/56 (18%)	56-10=46	No Response

One school said, “Yes, then wrote in “No unpaid are supported for credit unless non-profit org”.

Other qualities that you would identify as valuable in an internship:

- Increased level of discussion in classes.
- Employers have a cheap way to look at a potential employee.
- Students can also fine-tune preferences through different internship experiences.
- They learn to communicate with various levels of individuals with varying backgrounds and education.
- Internship is usually very positive, but depends heavily upon the employer and their experience with internship.
- Lets students know that what they are learning will help them in their careers.
- Pre-hire investigation by companies.
- Allowing students some responsibility. Shadowing.
- Networking. Exposure to real world. Visualization skills for the classroom.
- Alternative to academic knowledge.
- We have no formal internship program. Informal arrangements work well, so nothing needed.
- Communication skills. Problem Solving. Practical Application.

Company Survey -- Part One – This part of the study describes current internship experiences being supervised at the present time.

In describing the Company Survey population, of the 200 paper-based survey instruments mailed to a random sampling of the top 400 construction companies in the

United States, listed in the Engineering News Record Special Edition 2003, 75 companies participated in this study. The response rate of the Company Survey was 37.5 percent. The paper-based survey instrument was developed to appear identically with the on-line version and the e-mail version sent to the other populations of interest.

Company Participant Information:

- All 75 participant companies reported that they are located within the United States.
- The 75 participant companies characterized themselves under five different “Types” of construction including: Commercial; Heavy Highway/Civil; Industrial/Power; CM/Engineering/Design Build; and, Miscellaneous (Residential, Multi-family, other).
  - 27/75 (36%) Commercial
  - 16/75 (21%) Heavy Highway / Civil
  - 14/75 (19%) Industrial / Power
  - 10/75 (13%) Construction Management / Engineering / Design Build
  - 8/75 (11%) Miscellaneous (Residential, Multi-Family, Other)
- The 75 participant companies are classified into four categories for “Size” of company including: Small, Medium, Large and Undisclosed.
  - 24/75 (32%) Small – Less than 200 Million
  - 24/75 (32%) Medium – 200 Million to 500 Million
  - 15/75 (20%) Large – 500+ Million
  - 12/75 (16%) Undisclosed Size (but still of interest)

Company Survey -- Part One – This part of the study describes current internship experiences being supervised at the present time.

Do you presently provide a student internship program at your company?

Overall		By Type of Company	By Size of Company
		27/27 (100%)	23/24 (96%)
72/75 (96%)	Yes	16/16 (100%)	24/24 (100%)
3/75 (4%)	No	12/14 (86%)	14/15 (93%)
		10/10 (100%)	11/12 (92%)
		7/8 (88%)	Undisclosed

Are students paid during their internship experience with your company?

74/75	(98.7%)	Yes
0/75	(0%)	No
1/75	(1.3%)	No Response

What length of internship experiences do you supervise? Check ALL that apply.

1 Co-op		1=None
3/74	(4%)	2=5 Week
29/74	(39%)	3=10 Week
37/74	(50%)	4=15 Week
21/74	(28%)	5=>15 Week
17/74	(23%)	6=Other
1/75	(1.3%)	No Response

Descriptions of “Other” (Lengths of Internships supervised):

6 months.  
 Holidays and summers  
 Part-time during school year  
 12 weeks and 24 weeks  
 Fall/Spring/Summer Semesters  
 Summer, Spring & Christmas break  
 1 Year  
 Depends on student’s school requirements

In your opinion, what is the appropriate length of an internship experience?

0/74	(0%)	1=None
14/74	(19%)	2=5 weeks
37/74	(50%)	3=10 weeks



16/74	(22%)	4=15 weeks
8/74	(11%)	5=>15 weeks
4/74	(5%)	6=Other

Descriptions of “Other” (Appropriate Lengths of Internships):

10 weeks or longer  
 6 months  
 12-15 weeks  
 Summer + One Semester  
 As much as possible  
 1 Year  
 Depends on situation  
 Coop program – work fulltime for one or more semesters  
 Depends on degree pursuing  
 3 to 4 months

Do you have personnel dedicated to the administration of an internship program?

31/75	(41%)	Yes
44/75	(59%)	No

Do you hire graduates primarily from one university?

17/73	(23%)	Yes
56/73	(77%)	No
2/75	(3%)	No Response

Does your company presently attend university career fairs?

59/74	(80%)	Yes
15/74	(20%)	No
1/75	(1.3%)	No Response

Is your company a member of an industry advisory committee for a university construction program?

Overall	Actual Responses	
45/75 (61%)	45/73 (61.6%)	Yes
28/75 (38%)	28/73 (38.4%)	No
1/75 (1.3%)	1/73 (1.3%)	Unknown
1/75 (1.3%)	75-2=73	No response

What deliverables are required by the interns being supervised? (check ALL that apply).

19/73 (26%)	1= None
11/73 (15%)	2= Daily Logs
1/73 (1.4%)	3= Organizational Charts
7/73 (9.5%)	4= Formal Planned Goals and Objectives
20/73 (27%)	5= Final Written Report
28/73 (38%)	6= Student Evaluations - Midterm and Final
32/73 (44%)	7= Supervisor Evaluations - Midterm and Final
12/73 (16%)	8= Contact Sheet for Employment Supervisor
4/73 (5%)	9=Academic supervisor site visit with Student
2/73 (3%)	10=Academic supervisor site visit with Employer

Does an academic internship supervisor make site visitation(s)?

Overall	Actual Responses	
13/75 (17%)	13/66 (19.7%)	Yes
53/75 (71%)	53/66 (80.3%)	No
9/75 (12%)	75-9=66	No Response - Confused, both, sometimes , unknown

Student Survey -- Part One. This part of the study describes current internship programs.

In describing the student survey population, there were 31 student participants, from eleven schools in nine different states. This was a disappointing response rate since the 31 student participants represented eleven different schools that reported estimates of providing 481 possible participants for the study. Of the six schools that reported that they would provide a list of students for participation, there was the possibility of 369 student participants alone, with the additional four schools that reported that they would encourage participation there was the possibility of providing the additional 112 participants. The 31 students out of the possible 481, generated a disappointing response rate of 6.4%.

From part one of the School Survey, the thirteen (13) schools that answered “Yes” to the question: “Can you provide a list of students that participated in any of the previous sessions of internship?” were contacted and asked if they would provide a list of students that had recently participated in an internship program. After the great disappointment of resoundingly being told “No”, recommendations on how to acquire the necessary student participants were requested. Many of the school contacts said that they would look over an e-mail version of the Student Survey, and upon approval, would then “Forward” the e-mail survey to their list of recent interns. In that regard, only students wishing to voluntarily participate in the study would reply to the e-mail survey instrument.

Again, disappointed with the lack of results, this investigator utilized the School Survey -Part One again to identify additional schools that answered “Yes” to the question: “Will you encourage students to participate in a student survey concerning the internship experience?”

The e-mail student survey instrument was sent to these additional twenty-two (22) schools. After all methods of recruiting student respondents was exhausted, this part of the study generated the 31 student respondents.

#### Student Survey Participant Information:

The student survey population can be described as 31 voluntary participants from 11 different schools, from nine different states across the United States.

- All 31 participants are students in four-year universities or colleges located within the United States.
- All 31 participants are undergraduate students of construction education programs.
- The 31 participants listed their degree as a Bachelor of Science in either Construction Management or a Bachelor of Science in Industrial Technology with emphasis in Construction.
- All 31 participants responded that they had participated in a construction related internship.
- Although gender was not of concern in this study (only program information), only 2/31 (6%) of the respondents to the survey identified themselves as female.

Student Survey -- Part One. This part of the study describes current internship programs.

Does your school "require" internship as part of the curriculum for graduation?

22/31 (71%)	Yes
9/31 (29%)	No

Does your school "encourage" an internship or experiential component?

Overall	Actual Responses	
30/31 (97%)	30/30 (100%)	Yes
0/31 (0%)	0/30 (0%)	No
1/31 (3%)	31-1=30	No Response

Did you participate in an internship program before graduation?

30/31 (97%)	Yes
1/31 (3%)	No

What length of internship does your construction program require?

6/31	(19.4%)	None
2/31	(6.5%)	5 Weeks
5/31	(16%)	10 Weeks
0/31	(0%)	15 Weeks
6/31	(19.4%)	>15 Weeks
12/31	(38.7%)	Other

If other, please describe:

12 Weeks  
 184 Hours  
 One Full Semester  
 300 Hours  
 600 Hours  
 2 Years

Was your internship paid by the construction employer?

Overall		Actual Responses	
28/31	(90.3%)	28/30	(93%) Yes
2/31	(6.5%)	2/30	(7%) No
1/31	(3.2%)	31-1=30	No Response

How many tuition credit hours do students pay for their internship experience?

Overall		Actual Responses	
15/31	(48.4%)	15/30	(50%) None
4/31	(12.9%)	4/30	(13.3%) 3 hours
8/31	(25.8%)	8/30	(26.7%) 6 hours
1/31	(3.2%)	1/30	(3.3%) >6 hours
2/31	(6.5%)	2/30	(6.7%) Other
1/31	(3.2%)	31-1=30	No Response

Upon graduation, does the internship supervising employer want to hire you?

Overall		Actual Responses	
26/31	(83.9%)	26/30	(87%) Yes
4/31	(12.9%)	4/30	(13%) No
1/31	(3.2%)	31-1=30	No Response

If not, does another construction company want to hire you?

Overall	Actual Responses	
2/31 (6.4%)	2/30 (6.5%)	Yes
2/31 (6.4%)	2/30 (6.5%)	No
1/31 (3.2%)	31-1=30	No Response

If not, will you go to work in another field?

2/31 (6.5%)	Yes
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Will you seek employment after graduation?

Overall	Actual Responses	
29/31 (93.5%)	29/30 (97%)	Yes
1/31 (3.2%)	1/30 (3%)	No
1/31 (3.2%)	31-1=30	No Response

What deliverables were required in your internship program? (check all that apply)

9/31 (29%)	None
13/31 (41.9%)	Daily Logs
7/31 (22.6%)	Organizational Charts
16/31 (51.6%)	Formal Planned Goals & Objectives
15/31 (48.4%)	Final Written Report
17/31 (54.6%)	Student Self-Evaluations - Midterm and Final
15/31 (48.4%)	Supervisor Evaluations- Midterm and Final
7/31 (22.6%)	Contact Sheet for Employment Supervisor
7/31 (22.6%)	Academic supervisor site visit w/student
7/31 (22.6%)	Academic supervisor site visit w/employer

Did dedicated faculty supervise the internship experience?

Overall	Actual Responses	
13/31 (41.9%)	13/30 (43.3%)	Yes
17/31 (54.8%)	17/30 (56.7%)	No
1/31 (3.2%)	31-1=30	No Response

Did an academic internship supervisor make site visitation (s)?

Overall	Actual Responses	
8/31 (25.8%)	8/29 (27.6%)	Yes
21/31 (67.7%)	21/29 (72.4%)	No
2/31 (6.5%)	31-2=29	No Response

Did the school provide internships or did you have to acquire it on your own?

Overall	Actual Responses	
7/31 (22.6%)	7/29 (24%)	Yes
22/31 (70.9%)	22/29 (76%)	No
2/31 (6.5%)	31-2=29	No Response

Did the school provide a list of prospective employers for internship?

Overall	Actual Responses	
21/31 (67.7%)	21/30 (70%)	Yes
9/31 (29%)	9/30 (30%)	No
1/31 (3.2%)	31-1=30	No Response

Does the construction program provide a career fair for students to make contacts for future employment/internship opportunities?

Overall	Actual Responses	
22/31 (70.9%)	22/29 (76%)	Yes
7/31 (22.6%)	7/29 (24%)	No
2/31 (6.5%)	31-2=29	No Response

Does your school have a career fair that provides opportunities for employment/internship?

Overall	Actual Responses	
28/31 (90.3%)	28/30 (93%)	Yes
2/31 (6.5%)	2/30 (7%)	No
1/31 (3.2%)	31-1=30	No Response

Did you find your internship by attending a career fair?

Overall	Actual Responses	
6/31 (19.3%)	6/30 (20%)	Yes
24/31 (77.4%)	24/30 (80%)	No
1/31 (3.2%)	31-1=30	No Response

The number of hours I worked per week during my internship experience:

Overall	Actual Responses	
3/31 (9.75%)	3/30 (10%)	Less than 40 hours per week
15/31 (48.4%)	15/30 (50%)	An average of 40 hours per week
12/31 (38.7%)	12/30 (40%)	More than 40 hours per week
1/31 (3.2%)	31-1=30	No Response

The environment that I worked in (check all that apply):

9/31	(29%)	Headquarters
19/31	(61.3%)	Office
13/31	(41.9%)	Jobsite Trailer
20/31	(64.5%)	Field
9/31	(29%)	Other

Other:

Many combinations of Headquarters, Office with Field.

List other qualities that you would identify as valuable in an internship:

Communication between trades and direct supervision. Practical application of lecture topics.

It can help you make up your mind if you want to be in this industry or not.

Practical experience. Learning what will be expected of you when you graduate.

Gained experience and knowledge in field, and acquired contacts in industry.

Leadership qualities developed during the internship. Applying learning with real world application.

I feel that an internship in general is a very valuable asset in the construction management industry because you need OJT to really be able to get through your career.

Experience is the most critical and beneficial aspect of an internship. The requirement of 300 hours is very little.

Real-life experience, valuable contacts and unforgettable experience.

One-on-one relationships with people in the career field that you have chosen.

For students with little or no construction experience, it gives them an idea of what to expect after graduation. For those with some experience, it gives them a chance to try something new if they want.

### ***Subproblem Two -- Tabulation of Results***

This tabulation of results is a replication of the questions asked in each survey instrument, along with the tabulated responses given. These results were divided by participant type including School Survey, Company Survey and Student Survey. Note



that participants were allowed to participate fully even through they may have elected to omit responses to some questions.

### School Survey -- Part Two

This part of the study asked the respondents to rate the degree to which they agreed or disagreed with the following statements concerning the internship experience. Because some of the questions were not completed by all participants, the computation of percentages does not rely on the total 56 participating schools used in part one of the study. The percentages are based on the actual number of responses to each question.

One reason for providing internships is for pre-hire investigation of companies.

4/46	(9%)	1=Strongly Disagree
3/46	(7%)	2= Disagree
3/46	(7%)	3=Neutral
23/46	(50%)	4=Agree
13/46	(28%)	5= Strongly Agree

Internships provide insight into student's abilities.

0/46	(0%)	1=Strongly Disagree
0/46	(0%)	2=Disagree
3/46	(7%)	3=Neutral
26/46	(57%)	4=Agree
17/46	(37%)	5=Strongly Agree

Internships provide increased self-esteem of students.

0/46	(0%)	1=Strongly Disagree
1/46	(2%)	2=Disagree
9/46	(20%)	3=Neutral
22/46	(48%)	4=Agree
14/46	(30%)	5=Strongly Agree

Student performance represents construction program strengths/weaknesses.

1/45	(2%)	1=Strongly Disagree
6/45	(13%)	2=Disagree
11/45	(24%)	3=Neutral
23/45	(51%)	4=Agree
4/45	(9%)	5=Strongly Agree

The deliverables required fairly represent the work accomplished during this internship.

0/42	(0%)	1=Strongly Disagree
2/42	(5%)	2=Disagree
15/42	(36%)	3=Neutral
16/42	(38%)	4=Agree
9/42	(21%)	5=Strongly Agree

Interactions of students with professionals are considered valuable.

0/46	(0%)	1=Strongly Disagree
0/46	(0%)	2=Disagree
0/46	(0%)	3=Neutral
7/46	(15%)	4=Agree
39/46	(85%)	5=Strongly Agree

The internship experience is a positive experience.

0/46	(0%)	1=Strongly Disagree
0/46	(0%)	2=Disagree
3/46	(6.5%)	3=Neutral
9/46	(19.5%)	4=Agree
34/46	(74%)	5=Strongly Agree

I would recommend internship to other construction education programs.

0/45	(0%)	1=Strongly Disagree
0/45	(0%)	2=Disagree
6/45	(13%)	3=Neutral
7/45	(16%)	4=Agree
32/45	(71%)	5=Strongly Agree

The construction program provides enough guidance for students to be successful.

0/45	(0%)	1=Strongly Disagree
1/45	(2%)	2=Disagree

6/45	(13%)	3=Neutral
22/45	(49%)	4=Agree
16/45	(36%)	5=Strongly Agree

The construction program provides enough guidance for employers to be helpful to students.

0/45	(0%)	1=Strongly Disagree
6/45	(13%)	2=Disagree
10/45	(22%)	3=Neutral
22/45	(49%)	4=Agree
7/45	(16%)	5=Strongly Agree

The length of this internship program is appropriate.

0/44	(0%)	1=Strongly Disagree
1/44	(2%)	2=Disagree
9/44	(20%)	3=Neutral
28/44	(64%)	4=Agree
6/44	(14%)	5=Strongly Agree

The internship experiences help students in subsequent academic performance.

0/46	(0%)	1=Strongly Disagree
1/46	(2%)	2=Disagree
8/46	(17%)	3=Neutral
22/46	(48%)	4=Agree
15/46	(33%)	5=Strongly Agree

Internship opportunities provide students clarification of career choices.

1/46	(2%)	1=Strongly Disagree
0/46	(0%)	2=Disagree
4/46	(9%)	3=Neutral
23/46	(50%)	4=Agree
18/46	(39%)	5=Strongly Agree

The internship experience gives students the opportunity to synthesize classroom knowledge into practical applications.

1/46	(2%)	1=Strongly Disagree
0/46	(0%)	2=Disagree
0/46	(0%)	3=Neutral
20/46	(43%)	4=Agree

25/46 (54%) 5=Strongly Agree

### Company Survey -- Part Two

This part of the study asked the respondents to rate the degree to which they agreed or disagreed with the following statements concerning the internship experience. Because some of the questions were not completed by all participants, the computation of percentages does not rely on the total number of participating companies used in part one of the study. The percentages are based on the actual number of responses to each question.

One reason for providing internships is for pre-hire investigation of companies.

Overall  
 2/74 (2.7%) 1=Strongly Disagree  
 0/74 (0%) 2= Disagree  
 9/74 (12%) 3=Neutral  
 41/74 (55%) 4=Agree  
 22/74 (30%) 5= Strongly Agree  
 1 No Response

Internships provide insight into student's abilities.

Overall  
 0/74 (0%) 1=Strongly Disagree  
 0/74 (0%) 2=Disagree  
 1/74 (1%) 3=Neutral  
 19/74 (26%) 4=Agree  
 54/74 (73%) 5=Strongly Agree  
 1 No Response

Internships provide increased self-esteem of students.

Overall  
 0/74 (0%) 1=Strongly Disagree  
 0/74 (0%) 2=Disagree

10/74	(13.5%)	3=Neutral
47/74	(63.5%)	4=Agree
17/74	(23%)	5=Strongly Agree
1	No Response	

Student performance represents construction program strengths/weaknesses.

Overall		
0/75	(0%)	1=Strongly Disagree
9/75	(12%)	2=Disagree
28/75	(37%)	3=Neutral
32/75	(43%)	4=Agree
6/75	(8%)	5=Strongly Agree

The deliverables required fairly represent the work accomplished during this internship.

Overall		
1/72	(1.4%)	1=Strongly Disagree
4/72	(6%)	2=Disagree
34/72	(47%)	3=Neutral
30/72	(42%)	4=Agree
3/72	(4%)	5=Strongly Agree
3	No Response	

Interactions of students with professionals are considered valuable.

Overall		
0/75	(0%)	1=Strongly Disagree
0/75	(0%)	2=Disagree
0/75	(0%)	3=Neutral
27/75	(36%)	4=Agree
48/75	(64%)	5=Strongly Agree

The internship experience is a positive experience.

Overall		
0/74	(0%)	1=Strongly Disagree
0/74	(0%)	2=Disagree
2/74	(2.7%)	3=Neutral
19/74	(26%)	4=Agree
53/74	(72%)	5=Strongly Agree
1	No Response	

I would recommend internship to other construction companies.

Overall		
0/74	(0%)	1=Strongly Disagree
0/74	(0%)	2=Disagree
1/74	(1%)	3=Neutral
20/74	(27%)	4=Agree
53/74	(72%)	5=Strongly Agree
1	No Response	

The construction program provides enough guidance for students to be successful.

Overall		
0/74	(0%)	1=Strongly Disagree
4/74	(5%)	2=Disagree
25/74	(34%)	3=Neutral
43/74	(58%)	4=Agree
2/74	(3%)	5=Strongly Agree
1	No Response	

The construction program provides enough guidance for employers to be helpful to students.

Overall		
0/74	(0%)	1=Strongly Disagree
5/74	(7%)	2=Disagree
38/74	(51%)	3=Neutral
30/74	(41%)	4=Agree
1/74	(1%)	5=Strongly Agree
1	No Response	

The internship provides a vehicle to encourage employment with this company.

Overall		
1/74	(1%)	1=Strongly Disagree
1/74	(1%)	2=Disagree
2/74	(3%)	3=Neutral
31/74	(42%)	4=Agree
39/74	(53%)	5=Strongly Agree
1	No Response	

Internship opportunities provide students clarification of career choices.

Overall		
0/74	(0%)	1=Strongly Disagree
2/74	(3%)	2=Disagree
4/74	(5%)	3=Neutral
43/74	(58%)	4=Agree
25/74	(34%)	5=Strongly Agree
1	No Response	

The internship experience gives students the opportunity to synthesize classroom knowledge into practical applications.

Overall		
0/74	(0%)	1=Strongly Disagree
1/74	(1%)	2=Disagree
7/74	(9%)	3=Neutral
32/74	(43%)	4=Agree
34/74	(46%)	5=Strongly Agree
1	No Response	

List other qualities that you would identify as valuable in an internship.

Communication skills (written and verbal). Attention to detail.

Wage and benefits paid to student.

If and when a previous intern is hired full-time, they have already built up tenure and have the knowledge to be immediately productive without having to go through training.

Some interns (in a 9 month coop situation) can do just as much as an entry level permanent hire. We look at coops as a good way to address variable overhead.

Hands-on experience and interaction with other young engineers on a project is most helpful in determining future goals and career objectives.

Win-win-win. Students gain practical experience. Company benefits from help and enthusiasm. Students get exposure to the company. Company gets exposure to the student. There is no downside.

Site visit is a waste of time. Gives company an idea if intern fits with company culture. Pre-hire investigation of student.

Hands-on career choice exposure. Demonstrate, expose intern to real world, social dynamic and communications. Dynamics required to be successful in industry.

Provides good work experience and possible long-term career within the company. Students experience the “working world” and enables them to make more informed decisions regarding their future.

Internships provide students with the opportunity to determine whether or not they really want to become part of the construction industry. Construction company can help interns to be better construction industry professionals. Nothing in a classroom can adequately prepare or compare with real life hands-on experience.

Familiarity with basic expectations of employees. Makes transition to workplace faster and intern becomes a contributor sooner. Interns can learn what they are looking for in an employer.

Summer only internships are too short to provide optimal value to either party. Internships help improve classroom performance.

Arranging for accommodations and traveling to the internship location provides a great experience and sense of independence.

Personal character. Ability to work under stress or duress. Relationship from university to company. Longer term opportunities with university and employer.

We prefer intern students who are serious about their career, their industry of choice and their time on the job. We are more interested in the students that interact with our management team.

### Student Survey -- Part Two

This part of the study asked the respondents to rate the degree to which they agreed or disagreed with the following statements concerning the internship experience. Because some of the questions were not completed by all participants, the computation of percentages does not rely on the total participating students used in part one of the study. The percentages are based on the actual number of responses to each question.

One reason for providing internships is for pre-hire investigation of companies.

1/31 (3.2%)	1/29 (3.4%)	1=Strongly Disagree
2/31 (6.5%)	2/29 (6.9%)	2= Disagree
2/31 (6.5%)	2/29 (6.9%)	3=Neutral
15/31 (48.4%)	15/29 (51.7%)	4=Agree
9/31 (29%)	9/29 (31%)	5= Strongly Agree
2/31 (6.5%)	No Response	



The experience gained during the internship was valuable to me.

0/31	(0%)	0/29	(0%)	1=Strongly Disagree
1/31	(3.2%)	1/29	(3.4%)	2= Disagree
0/31	(0%)	0/29	(0%)	3=Neutral
9/31	(29%)	9/29	(31%)	4=Agree
19/31	(61.3%)	19/29	(65.5%)	5= Strongly Agree
2/31	(6.5%)		No Response	

The internship experience helped me to clarify my career choices.

0/31	(0%)	0/29	(0%)	1=Strongly Disagree
3/31	(9.7%)	3/29	(10.3%)	2= Disagree
2/31	(6.5%)	2/29	(6.9%)	3=Neutral
8/31	(25.8%)	8/29	(27.6%)	4=Agree
16/31	(51.6%)	16/29	(55.2%)	5= Strongly Agree
2/31	(6.5%)		No Response	

The internship experience gave me the opportunity to synthesize classroom knowledge into practical application.

0/31	(0%)	0/29	(0%)	1=Strongly Disagree
2/31	(6.5%)	2/29	(6.9%)	2= Disagree
4/31	(12.9%)	4/29	(13.8%)	3=Neutral
12/31	(38.7%)	12/29	(41.4%)	4=Agree
11/31	(35.5%)	11/29	(37.9%)	5= Strongly Agree
2/31	(6.5%)		No Response	

The deliverables required fairly represent the work accomplished during the internship.

0/31	(0%)	0/29	(0%)	1=Strongly Disagree
2/31	(6.5%)	2/29	(6.9%)	2= Disagree
9/31	(29%)	9/29	(31%)	3=Neutral
12/31	(38.7%)	12/29	(41.4%)	4=Agree
4/31	(12.9%)	4/29	(13.8%)	5= Strongly Agree
2/31	(6.5%)		No Response	

The interactions of students with professionals during internship are valuable.

1/31	(3.2%)	1/29	(3.5%)	1=Strongly Disagree
0/31	(0%)	0/29	(0%)	2= Disagree
1/31	(3.2%)	1/29	(3.5%)	3=Neutral
7/31	(22.6%)	7/29	(24.1%)	4=Agree
20/31	(64.5%)	20/29	(68.9%)	5= Strongly Agree

2/31 (6.5%) No Response

The internship experience was a positive experience for me.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
0/31 (0%)	0/29 (0%)	2= Disagree
4/31 (12.9%)	4/29 (13.8%)	3=Neutral
8/31 (25.8%)	8/29 (27.6%)	4=Agree
17/31 (54.8%)	17/29 (58.6%)	5= Strongly Agree
2/31 (6.5%)		No Response

I would recommend internship to other students of construction education programs.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
0/31 (0%)	0/29 (0%)	2= Disagree
1/31 (3.2%)	1/29 (3.5%)	3=Neutral
5/31 (16.1%)	5/29 (17.2%)	4=Agree
23/31 (74.2%)	23/29 (79.3%)	5= Strongly Agree
2/31 (6.5%)		No Response

I would recommend my internship construction employer to other students.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
4/31 (12.9%)	4/29 (13.8%)	2= Disagree
3/31 (9.7%)	3/29 (10.3%)	3=Neutral
6/31 (19.4%)	6/29 (20.7%)	4=Agree
15/31 (48.4%)	15/29 (51.7%)	5= Strongly Agree
2/31 (6.5%)		No Response

Internships provide students increased self-esteem or self-confidence.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
0/31 (0%)	9/29 (0%)	2= Disagree
5/31 (16.1%)	5/29 (17.2%)	3=Neutral
11/31 (35.5%)	11/29 (37.9%)	4=Agree
13/31 (41.9%)	13/29 (44.8%)	5= Strongly Agree
2/31 (6.5%)		No Response

The school provides enough guidance for students to be successful during their internship.

0/31 (0%)	0/28 (0%)	1=Strongly Disagree
0/31 (0%)	0/28 (0%)	2= Disagree
9/31 (29%)	9/28 (32.1%)	3=Neutral

11/31 (35.5%)	11/28 (39.3%)	4=Agree
8/31 (25.8%)	8/28 (28.6%)	5= Strongly Agree
3/31 (9.6%)		No Response

The school provided enough guidance for employers to be helpful to students.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
4/31 (12.9%)	4/29 (13.8%)	2= Disagree
13/31 (41.9%)	13/29 (44.8%)	3=Neutral
9/31 (29%)	9/29 (31.1%)	4=Agree
3/31 (9.7%)	3/29 (10.3%)	5= Strongly Agree
2/31 (6.5%)		No Response

The length of this internship program is appropriate.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
1/31 (3.2%)	1/29 (3.4%)	2= Disagree
4/31 (12.9%)	4/29 (13.8%)	3=Neutral
18/31 (58.1%)	18/29 (62.1%)	4=Agree
6/31 (19.4%)	6/29 (20.7%)	5= Strongly Agree
2/31 (6.5%)		No Response

The internship experiences helped me in subsequent academic performance.

0/31 (0%)	0/29 (0%)	1=Strongly Disagree
1/31 (3.2%)	1/29 (3.4%)	2= Disagree
6/31 (6.5%)	6/29 (20.7%)	3=Neutral
13/31 (41.9%)	13/29 (44.8%)	4=Agree
9/31 (29%)	9/29 (31%)	5= Strongly Agree
2/31 (6.5%)		No Response

List other qualities that you would identify as valuable in an internship:

Communication between trades and direct supervisors. Practical application of lecture topics.

Practical experience. Learning what will be expected of you when you graduate.

It can help you make up your mind if you want to be in this industry or not.

Gained experience and knowledge in field, and acquired contacts in the industry.

Leadership qualities developed during the internship. Applying learning with real world application

I feel that an internship in general is a very valuable asset in the construction management industry because you need OJT to really be able to get through your career. The CM program does a very effective job in

preparing students for their careers. The biggest problem is the lack of experience in documentation.

Experience is the most crucial and beneficial aspect of an internship. The requirement of 300 hours is very little.

Real-life situations, yet patient, helpful co-workers around to explain how things are supposed to be. Involve the intern in most everything and give the intern a real desire to come back.

Real life experience, valuable contacts and unforgettable experience.

One-on-one relationships with people in the career field that you have chosen.

For students with little or no construction experience, it gives them an idea of what to expect after graduation. For those with some experience, it gives them a chance to try something new if they want.

## VITA

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**EDUCATION**

- Ph.D. Doctor of Philosophy in Architecture with a Major in Architecture  
 Texas A&M University, College Station, Texas  
 (major area of study - Construction Science, minor area of study - Education).  
 Degree conferred May 2005.
- M.S. Master of Science in Technology with a Major in Industrial Technology  
 Texas State University – San Marcos, San Marcos, Texas  
 (formerly Southwest Texas State University)  
 Degree conferred August 1999  
 Cognate: Curriculum and Instruction
- B.S. Bachelor of Science in Technology with a Major in Industrial Technology with  
 Teacher Certification  
 Texas State University – San Marcos, San Marcos, Texas  
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 Degree conferred December 1996 - Magna Cum Laude

**PUBLICATIONS**

Hager, C. J., Pryor, C. R., and Bryant, J. A. (2003). A comparison of four domain area standards for internships and implications for utilization in undergraduate construction education internship programs. *International Journal of Construction Education and Research* (formerly Journal of Construction Education), 8 (3), 157-179.

**TEACHING BACKGROUND**

- Aug. 1998 to Present Full-time Lecturer at Texas State University – San Marcos, TX  
 Department of Technology
- Jan. 1997 to May 1998 Technology Education Teacher, Boerne High School,  
 Boerne, TX – Technology Education Secondary Certification

**HONORS AND AWARDS**

Golden Key Honor Society 1996, Alpha Chi Honor Society 1996,  
 Presidential Upper Level Scholarship, Southwest Texas State University, 1995-1996,  
 Department of Technology Awards for Leadership, Service, and Scholarship, 1993,  
 1994, 1995, Southwest Texas State University, San Marcos, TX