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AUTHOR	Schambach, Thomas P.; Dirks, Jim
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Internships are often omitted from or put-off until late in some students' programs of study. Some academics are reluctant to accept the academic legitimacy of applied work programs, thus cooperative education programs are not offered or encouraged in some curriculums. This study invited students finishing their internship experiences to reflect on the legitimacy of internships as a method to enhance their educational experience and to prepare students for careers as computing professionals. The student subjects in this research were all computing majors (Computer Science, Information Systems, Telecommunications). Results reported in this study are based on two data collection methods. Fixed format scaled responses from a small sample (N=70) were used to gather and analyze description statistics of graduating interns' perceptions. In addition, open format responses were evaluated, coded and summarized from a corresponding sample. Student responses were strongly favorable concerning their internship experiences. Most students described the internship as a great experience that had a major impact on their learning and on their understanding of real world issues and environments. Respondents overwhelmingly recommended that other students get involved in cooperative education opportunities, preferably early within their major program of study. (Author)

STUDENT PERCEPTIONS OF INTERNSHIP EXPERIENCES

Thomas P. Schambach
Illinois State University

Jim Dirks
Illinois State University

ABSTRACT

Internships are often omitted from or put-off until late in some students' programs of study. Furthermore, some academics are reluctant to accept the academic legitimacy of applied work programs, thus cooperative education programs are not offered or encouraged in some curriculums. This study invited students finishing their internship experiences to reflect on the legitimacy of internships as a method to enhance their educational experience and to prepare students for careers as computing professionals. The student subjects in this research were all computing majors (Computer Science, Information Systems, Telecommunications). Results reported in this study are based on two data collection methods. Fixed format scaled responses from a small sample (N=70) were used to gather and analyze description statistics of graduating interns' perceptions. In addition, open format responses were evaluated, coded and summarized from a corresponding sample. Student responses were strongly favorable concerning their internship experiences. Most students described the internship as a great experience that had a major impact on their learning and on their understanding of real world issues and environments. Respondents overwhelmingly recommended that other students get involved in cooperative education opportunities, preferably early within their major program of study.

INTRODUCTION

Businesses need a diverse, well-educated workforce in order to successfully adapt to rapidly changing technology-enabled practices. Thus, to ensure ongoing competitiveness organizations and nations must continually develop their human capital, understanding that the educational system represents the pipeline to enable future success. Ensuring that graduates acquire appropriate competencies before entering the workforce is a joint responsibility of students, educational institutions, and potential employers.

Internships (Co-operative Education) further the social and economic development of society using education programs that expand the learning experience of students by combining academic studies with work experience. Although variations exist, internships typically involve paid, full-time, temporary employment in a structured setting where the student works in a job role related to their degree focus. Internships typically include at least one full-time term (quarter, semester) of employment and sometimes require two terms. Students receive academic credit for their internship and often have assignments requiring them to reflect on the parallels between workplace experiences and the concepts learned in coursework. This experiential learning approach entails a different yet complimentary learning process relative to traditional classroom based educational setting. While an internship experience has some relatively obvious advantages for the student, it also provides significant advantages to the sponsoring firm, to the educational institution, and to workforce preparedness of the nation at large.

Large employers increasingly demand work experience when recruiting new hires, including new graduates. Cooperative education based industrial internship

programs provide students an opportunity to gain practical work experience in their area of professional study. Supported by theories of experiential learning, experiential education can increase the motivation of the learner, improve long-term retention, and lead to a greater sense of personal accomplishment (Palmer, 1987; Cross, 1994). Furthermore, an internship demonstrates that the student is both informed and serious about his or her career direction. The significant impact of real-world experience is supported by the report that over 90% of recruiters say internship experience is viewed as an important factor in screening job applicants' resumes (Wilson 1997). Internship programs potentially provide benefits to the student intern, to the sponsoring organization, and to the academic department facilitating the cooperative education relationship.

POTENTIAL BENEFITS OF INTERNSHIPS

As mentioned previously, cooperative education (internships) potentially benefits the student, the employing firm, the associated educational institution, and more generally the preparedness of the national workforce. Benefits to the participating student include increased motivation of the learner, improved long-term retention of material, and a greater sense of personal accomplishment. The intern receives an extended opportunity to apply previously learned conceptual knowledge in a real organizational setting. Such settings are generally more complex than can be simulated in classroom based exercises or case studies. This real-world encounter reinforces conceptual learning, makes it more visible, and emphasizes task importance. Moreover, working in organizational settings makes the intern more aware of the importance of 'soft skills' such as effective communication, social interaction, teamwork, and ability to problem-solve in environments where defining the problem is a major part of the overall job. Other benefits for the intern include clarification of career goals, awareness of organizational settings, clarification of valuable competencies, increased relevance of learning, establishing self-confidence, financial assistance for educational expenses, contacts with and previews of potential employers, exposure to working role models (potential mentors), and an increase in marketable job skills that often positively impact employability and starting salary. Importantly, internships grant an opportunity to verify career interest and desire to pursue a career in a given profession or specialty area; the opportunity to become more aware of the skills most valued by industry; the opportunity to select courses and steer their remaining course-work based on enhanced perspectives gained during their internships. In addition, student interns reinforce previous course-work and better understand course topics by framing the academic concepts in terms of analogies and perspectives gained during real work experiences.

In return for their mentoring investment, sponsoring corporations obtain relatively inexpensive professional labor while concurrently conducting a pro-longed interview as a basis for hiring decisions. Moreover, a mutually successful internship experience enables an advantageous personal relationship that facilitates recruitment of the student following graduation (Tobias, 1996). Importantly, intern employers engage a cost-effective, low-risk means of evaluating potential future employees. When hired, interns tend to demonstrate high retention based on realistic expectations. Moreover, in tight labor markets firms may experience few graduate applicants if they forego the chance to recruit early in the students' career preparation, since many interns receive offers from their internship employer. Furthermore, the organization may gain new perspectives or practices based on new technologies and techniques that the student intern transfers from their university experiences. Often the students can offer new ideas (based on classroom exposure to new concepts or technologies) and new perspectives. Some internships result in ongoing joint research relationships between the firm, student, and sponsoring university, and provide organizations with opportunities to influence curriculum design and content.

For the associated educational institution internships enable an additional route for communication with the business community. Such liaison enables feedback concerning the relevancy and quality of academic programs. Thus, academic departments' might benefit by strengthening their relationship with industrial partners, while also obtaining feedback (via intern assessment) concerning the quality of their academic product (valued student/graduates). Moreover, feedback from both the sponsoring organization and the student interns provide insights to the skills being sought in industry. These insights assist the department's ongoing efforts in curriculum development and refinement. Such feedback, through direct communication with employers, and intern feedback about competencies used enable educators to adjust course offerings and course content to meet evolving needs of society.

Furthermore, upon returning to the classroom interns often demonstrate more confidence and more responsibility, and through sharing their field experience help to enliven discussion of academic concepts via examples of practical application, thus helping the entire class to better envision the relevancy of conceptual topics.

DEVELOPING THE RESEARCH FOCUS

Although several sources indicate students gain value from the internship experience (Tobias 1996; Wilson 1995), the evidence to support benefit claims is largely anecdotal. For example, the Association for Computing Machinery (ACM) career consultant, Jack Wilson, says it is extremely important in today's business environment to show evidence of relevant work experience. When university graduates are competing for top jobs at top companies they should expect to face tough competition from other academically qualified candidates. According to Wilson, "when you are competing for employment with other great students from good schools, with good grades and skills, your relevant work experience can make a big difference."

While the benefits proposed seem relevant and realistic; it is not evident that everyone concludes the benefits are real or warrant educational consideration. Although encouraged by some academics, experiential learning has skeptics who question the ability of workplace activities to assist in achieving academic goals (Gore and Nelson, 1984); opponents believe experience alone doesn't warrant the awarding of academic credit or academic resources (Whitaker, 1989). Lacking evidence of academic value, college faculty grant relatively limited commitment and support toward experiential learning programs, such as co-ops and internships (Gore and Nelson, 1984). Although experiential learning seems particularly relevant within applied disciplines (Cross, 1994), there is a scarcity of research concerning the success of internships within the realm of information systems education.

In the Applied Computer Science (ACS) programs at Illinois State University students are highly encouraged (semi-mandated) to participate in a relevant computing related internship. While a large proportion of ACS students seem eager to gain an internship experience, others are less enthusiastic, and some are skeptical about delaying their entrance into the real job (permanent employment) market, especially in an era (1998-2000) when jobs were plentiful. A few even voiced the opinion that the internship program is a university supported industrial conspiracy to co-opt talented professional labor at below market wage rates.

RESEARCH QUESTIONS

The purpose of the current study is to analyze data that empirically examines claims related to benefits incurred by student interns. The research questions being evaluated are summarized in Table 1. We anticipate these findings will be meaningful to future students, to curriculum planners, to the faculty supporting the internship program, and to our many industrial partners who continue to demonstrate interest in sponsoring internship contracts and hiring graduates with internship experience.

METHODOLOGY

Graduating internship students are used as the data source of this study in order to obtain credible results from the perspective of prospective internship students. Graduating internship students are defined here as students who have successfully completed an internship experience; however, these students normally have additional course-work to complete before they'll graduate from ACS degree programs. The analysis of survey data was conducted in two ways. First we conducted an analysis of previous student comments concerning internship experiences. This included parsing, coding, categorizing, and summarizing student comments regarding their internship experiences. These comment categorizations were then used in conjunction with a literature review to construct a Likert-type scaled survey instrument. The closed-format survey used a five point scale ranging from 1 = Strongly Agree to 5 = Strongly Disagree.

The scaled survey instrument was completed by a subset of Summer 1997 and Summer 1999 student interns. The scaled survey subset is composed of students who returned their standard internship evaluation forms during regular office hours and thus could be requested to complete this supplemental survey. Statistical results reported in this study are based on 70 scaled-survey responses along with a representative sample of student comments from a larger respondent sample who submitted a standard internship evaluation used by our cooperative education office. Open format narrative responses were culled from optional student replies to the question "What would you tell other young ACS majors trying to decide whether or not to become

TABLE 1
RESEARCH QUESTIONS

The following research questions are based on the perceptions of graduating internship students.	
1.	To what extent did the internship provide an opportunity to gain real-world work experience that seems to be valued by industry/recruiters.
2.	To what extent did the internship provide you an opportunity to verify whether to pursue a career in the I/S profession.
3.	To what extent did the internship provide an opportunity to learn more about a potential employer.
4.	To what extent did the internship provided an opportunity to gain confidence in professional skills and capabilities.
5.	To what extent did the internship provide an opportunity to learn valuable skills that would be difficult to learn in a classroom.
6.	To what extent did the internship provide the background to better understand course-work by comparing course concepts to real world computing experience.
7.	To what extent did the internship provide an opportunity to gain awareness of what skills are used and valued in the workplace.
8.	To what extent did the internship enable improved interpersonal communication skills.
9.	To what extent did the internship enable improved technical skills.
10.	To what extent did the internship provide an opportunity to redirect computing studies toward specific areas of interest.
11.	To what extent did the internship provide an opportunity to select future courses based on a more informed perspective.
12.	Overall, how enjoyable was the coop/internship experience?
13.	Overall, how valuable was the coop/internship experience?
14.	Financial compensation received was good (fair market value).
15.	Would you recommend that other students participate in a coop/internship experience?

involved in the Cooperative Education Program?" Narrative responses were parsed into 145 comments that were then coded for classification. These open format narrative comments are used to add richness and to supplement the descriptive statistical analysis.

RESULTS

Student responses provide strong evidence that the internship experience is worthwhile and valuable. Table 2 illustrates the percent of respondents who agreed or strongly agreed (item response=1), the mean score for the item on a five-point scale, and the standard deviation. The survey items' number reflects the research question from Table 1.

Responses to the first research question show near unanimous agreement that student interns perceive the experience gained to be valuable in terms of industry recruitment. Sixty-seven of seventy respondents believe the internship provided a valuable real-world experience. Eighteen parsed comments relative to this question included several declaring job offers, others noting prospects for future employment with their coop

TABLE 2
DESCRIPTIVE STATISTICS REGARDING INTERNSHIP EXPERIENCE

Survey Item	% Agree or StronglyAgree	Mean Score	Standard Deviation
Item 1: valuable real-world experience	95.7	1.34	.56
Item 2: verify decision on I/S career path	78.6	1.80	.93
Item 3: learn more about a potential employer	87.1	1.66	.90
Item 4: gained confidence in my skills, capabilities	88.6	1.57	.69
Item 5: learned skills difficult to learn in classroom	88.6	1.49	.81
Item 6: background to better understand course-work	84.3	1.76	.81
Item 7: gained awareness of valued skills in workplace	97.1	1.53	.56
Item 8: improved my interpersonal skill	90.0	1.70	.69
Item 9: improved my technical skills	87.1	1.60	.75
Item 10: helped re-direct my studies to area of interest	78.6	1.77	.89
Item 11: enables course selection from more informed basis	68.6	2.10	1.01
Item 12: Overall, how enjoyable was the coop experience	95.7	1.51	.63
Item 13: Overall, how valuable was the coop experience	95.7	1.46	.63
Item 14: Financial compensation received was good (fair market value)	47.1	2.34	1.43
Item 15: Recommend that other students participate in a coop/internship experience (Yes/No item)	97.1		

sponsor, and others declaring valuable experiences that would help build their resume.

Response to the second research question shows strong agreement that the internship helped to verify their desire to pursue a career in the computing profession. While most respondents agreed (79%) only three indicated disagreement with the statement. Coop experience allows students to get a taste of the real-world and thus to verify whether their targeted career area is in fact something they really want to do. For example, "Coop is a great experience—I got a taste of what my future job/career will be like" was reported by one student. In some cases real-world experience can also help confirm areas in which the person does not want to work. For example, one student commented "my coop helped me realize I don't want a career in COBOL coding."

Item 3 three responses demonstrate widespread agreement (87%) that the internship provided the opportunity to learn more about a potential future employer. Limited response variance is reflected in the low standard deviations and seems to reflect widespread

respondent agreement concerning the benefits associated with their internship experience. Although the intern program is not intended to lead directly to job offers, several students reported via the free-format evaluation responses that they had accepted jobs with the internship sponsor. This corresponds with verbal comments received from many near-graduation seniors that they intend to start work with their internship sponsor. In addition to "firm" job offers for more senior students, several less advanced students commented on the internship as "a great way to get your foot-in-the-door with a good company" by building a network of business contacts.

Responses to research question four and five demonstrate that approximately 89% of students perceived the internship experience to have increased their professional self-confidence while also providing an opportunity to learn valuable skills that would be difficult to learn in a classroom environment. Student comments indicate learning to work cooperatively in large project teams, and to gain awareness of business etiquette, politics, and ambiguity. In addition, students learned that they can be successful in the semi-structured context of the real world and that there is value to the skills and knowledge they have been gaining from coursework. For example, one student commented that "coop builds confidence in your abilities and the value of what your learning (in class)."

Responses to research question six indicates 84.3% of the respondents believe their internship will improve and benefit their understanding of course concepts by providing real-world experience for comparison and analogy. Narrative responses note the internship was valuable not only for learning new things but also for reinforcing skills learned in the classroom.

Responses to research question seven showed almost all students (97.1%) agree their internship gave them a better awareness of what skills were used and valued in the workplace. Narrative comments suggest benefits in viewing new technologies in use and witnessing emerging technological trends through the eyes of mentors and other professionals.

Responses to research question eight and nine demonstrate that internship enabled students to enhance both their interpersonal communication (90%) and technical skills (87.1%). Many respondents commented that more learning occurs during the coop than in most classes. This tendency was especially salient in regard to soft skills, teamwork, and an appreciation for organizational environments and the realization of uncertainty. Importantly, only one student disagreed that their interpersonal communications skills were improved by their internship. "Soft skill" enhancement was also supported by narrative comments.

Responses to research question ten and eleven display wide-ranging agreement concerning the value of internships to enable more informed direction and decisions concerning the targeting of personal academic programs and courses toward specific career interest areas. Nearly 79% of student respondents agree the coop experience helps in targeting programs of study while approximately 69% believe it will enable selection of courses from a more informed perspective. Analysis of free-form comments indicate that for some students the internship experience came too late in their degree program because their few remaining courses were pre-determined by degree requirements. Other comments noted that the internship experience reinforced existing course-of-study plans rather than enabling new decisions. For example, one student declared "I only became more convinced that I want to take a course involving the design and implementation of web pages." Another student noted that "coop is a good idea; early in curriculum it can reshape your education." Another advantage of an early curriculum internship experience is that it allows for multiple coop experiences in varied work settings. As noted by one aspiring coop enthusiast "Coop is a great experience—I plan to do it again!"

Responses to research question twelve informed us that almost all (96%) respondents found their internship to be enjoyable. Only one respondent disagreed. Moreover, response to research question thirteen demonstrates the students' collectively (96%) perceived value of participation in an internship assignment. Again, only one of seventy respondents disagreed that the internship experience was valuable. Student comments, such as, "the intern experience is invaluable" leave little doubt as to the perceived value of time and efforts devoted to the internship program. In the words of another student "Do it! Coop is a great experience, plus you get paid!"

The only survey item receiving wide variability in response related to the fairness of compensation. Forty-seven percent rated compensation as "good" and nearly 39% rated compensation as "fair" while approximately 14% rated the compensation as poor.

Given that some students delay their internship until the final semester of their senior year it is understandable that some senior students would view internships as a delay in their procuring a real-job at real-job compensation rates (which averaged about $40,000 per year for new IS graduates at the time of the study). Nonetheless, practical experience is required for graduation and so all ACS students must participate in a full term internship or demonstrate an alternative method by which they gained practical IS work (project) experience.

Responses to research question fifteen strongly support the wisdom of "Just Do It". Item fourteen asked for a simple Yes/No answer to the question "Would you recommend that other students participate in a coop/internship experience?" Nearly unanimous (97%) agreement to this question indicates that internship experienced students overwhelming support the merit of cooperative education programs. While many narrative responses encouraged future students to take advantage of internship opportunities, several stronger comments declared the coop experience "should be absolutely required."

DISCUSSION AND LIMITATIONS

Strong agreement, such as demonstrated above for item fifteen, is potentially in-part an artifact of the limited sample used for analysis of scaled responses on a survey distributed by the department's coop coordinator. Nonetheless, respondents were provided with the 'cloak of anonymity' and thus were under no personal threat or influence regarding their responses. Furthermore, the free-format responses received from a larger sample were also nearly unanimous in supporting the value of internship experiences. Even the few negative comments received did not contradict the learning or professional value of a coop experience. The few negative comments received focused on either paying fees for internship course credit, or a feeling that the student had been placed in a non-challenging or unpleasant work context. For example, one student protested "I don't see why we are required to pay ISU for internship hours—I found the job myself and used no ISU resources!" In contrast to this complaint other students noted "it's great that working got me school credit" and that the coop office made finding a placement easy. Another less enthusiastic student noted "it wasn't the experience I was hoping for but now I have a better perspective on the real world." This last, somewhat negative, commentary suggests the student had in fact actually valued (if not enjoyed) the internship experience.

In summary, a vast majority scaled survey responses show coop graduates' perceived multiple benefits and value in their internship experience. Furthermore, approximately 98% of 145 parsed comments were favorable regarding the internship program. Moreover, the fact that intern graduates were willing to voluntarily spend time preparing comments to share perceptions about their internship experience is further evidence of their enthusiastic interest level regarding the coop/internship program.

The following student comments capture the essence of perspectives gathered from student comments. From one pragmatic student we heard "It's a great deal. You get course credit, work experience, and you get paid." A more learning focused comment proclaims, "the amount of knowledge you gain through a coop is incredible" while another proclaims "my work experience complemented my school studies, topics that were unclear in class suddenly made sense when I had the opportunity to work through the issues with a hands-on approach rather than just reading about them." Furthermore, a student providing counsel for new computing majors stated, "I would definitely encourage other students to participate in an internship. The internship provided me with a real sense of how the business world operates and enabled me to apply the knowledge I learned in the classroom to a real world situation." Finally, a senior student claimed the most pragmatic of benefits, "Great news! I will begin full-time employment with CAT in August."

In conclusion, students who have completed internship experiences highly recommend that other students invest in the opportunity to participate in cooperative education programs. The benefits perceived and reported by students include recruitment advantages, an excellent method of learning, better understanding of organizations and career focus, as well as reinforcement of course learned skills and enhanced confidence in their own professional capabilities. For institutions that are interested in serving the needs and values of their student stakeholder this research sends a clear message that students strongly value internship experiences. Institutions, faculty, curriculum planners, future students, and parents need to be aware of the very positive findings concerning participation in cooperative education workplace experiences.

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