

Employer Assessment of Information Systems Internships Based upon Student Perception of the Employer's Support

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ABSTRACT

This paper presents an analysis of survey responses resulting from a questionnaire submitted by employers of student interns and another questionnaire submitted by the student interns. The employer survey contains fourteen questions rating the interns on a ten point psychometric scale while the student survey contains five questions rating the employers' support of the internship on a five point psychometric scale. Employer and student surveys are completed independently of one another so that employers don't know the ratings of their interns and the interns don't know the ratings of their employers. A Pearson correlation matrix provides strong evidence of positive and significant associations among employer survey responses and student survey responses. One-way between subjects ANOVA calculations are generated to compare the effects of the fourteen individual employer responses on the five responses contained in the student survey rating the students' perceptions of employer support.

Keywords: internships, survey analysis, ANOVA

INTRODUCTION

The Metropolitan State University of Denver is a state supported university located in downtown Denver. The University draws its 24,000 students primarily from the greater Denver metropolitan area and graduates generally remain in the area. MSU Denver is divided into three colleges that house a large number of academic programs and majors. The University also houses a graduate school that offers a variety of master's degrees. MSU Denver is one of three academic institutions that share the 150 acre urban Auraria campus. The University of Colorado at Denver and the Community College of Denver are also housed on the Auraria campus. The Department of Computer Information Systems and Business Analytic (CISBA) is one of six departments that comprise the AACSB accredited College of Business. During the past twenty years the University, and especially the College of Business, has sought to partnership with area businesses. The CISBA department partners with the Applied Learning Center (ALC) to provide information systems internship opportunities to qualified students.

The CISBA department is an ABET accredited program that supports a highly successful internship program which allows qualified students the opportunity to work in qualified organizations under the supervision of an experienced professional. Students may register for an internship with a qualified organization and receive academic credit. The student may use the academic credit to count as an upper division CISBA elective or as a general elective. The student intern must work under the supervision of a qualified professional who must report feedback to the CISBA department by completing a questionnaire evaluating the performance of the intern. A person from the ALC and/or a faculty member from the CISBA department must conduct a site visit and meet with both the intern and the supervisor. The intern must also provide the faculty supervisor with a log of hours worked and a final report demonstrating compliance with the agreed upon objectives. This paper analyzes the responses of employers submitted through the questionnaire on how they evaluated the student interns and on the responses of students on the questionnaire on how they evaluated the support provided by their employers.

OVERVIEW OF THE CISBA INTERNSHIP PROGRAM

Internships are an important part of the curriculum – not just within the CISBA department but also throughout the College of Business and the general University. Although internships are not “taught” in the same sense as the more conventional courses, they are worthy of the same analysis and scrutiny. An internship is an essential learning experience. An internship allows a student to work at a position in the general real-world environment and receive academic credit for it. The prospective intern must have the position approved by the faculty supervisor from within the CISBA department and by the CISBA department chair. The prospective employer is also vetted to ensure that the student intern is working under the supervision of a professional in the field. The student and employer must decide on a clearly defined set of measurable objectives which is reviewed and approved by the faculty supervisor. Internships consist of one, two, three, or four credit hours and must be completed during a specified time frame

(usually one semester). It is incumbent upon the student to submit a written report with supporting documentation at the end of the semester demonstrating that the objectives have been met. The faculty supervisor, in consultation with the employer, will assign a grade for the course.

Any student enrolled at MSU Denver who meets the requirements is eligible to participate in the internship program. The student does not need to be a CISBA major, however, the great majority of students enrolled in the program are upper level CISBA majors. An eligible student must be degree-seeking with a CGPA of at least 2.5, have a sophomore standing, have completed one full semester at the University, and be enrolled in a minimum of twelve credit hours per year. The position must involve work directly related to the curriculum content in the CISBA department.

Internships are designed to provide students with the opportunity to learn new skills under the guidance of experienced professionals. Completing low level tasks such as entering data into forms, doing backups, or answering telephone calls are deemed unacceptable. Internships may be paid or unpaid although almost all of the internships through the CISBA department are paid. The faculty supervisor and department chair ultimately have the final say on the acceptability of the internship. The internship should not be a reward for past experience or previously acquired knowledge. If the prospective intern has been at the same position for a relatively short period of time (about one year or less) the student is generally allowed to use the current position for the internship. If the prospective intern has been on the job for a longer period, he or she may still be eligible for an internship if the responsibilities have changed significantly over the past year. CLEP exams, credit-by-examination, and portfolio review are used to provide academic credit for prior knowledge.

An internship could be secured in different ways. An employer seeking an intern should contact the ALC. A representative of the ALC will qualify the employer and enter the information into a database. Students seeking an internship are given access to the employer database and apply for the position much like they would apply for a job. The student would submit a resume and hopefully be contacted for an interview. A student could apply directly to an organization in which he or she was interested. If the organization had a mutual interest, the student would contact the ALC and the student and employer would be registered. Also, a student currently holding a qualified position could apply for an internship if the employer agreed to comply with the internship protocol. Regardless of how the placement is obtained, the student must enroll in the CIS 3980 Internship course and follow all published procedures in order to receive academic credit.

The student, the employer, and the faculty supervisor all sign a contract that clearly states what is expected of the student and employer supervisor. The student must work a minimum of fifty hours for each hour of academic credit requested. The student must demonstrate through a log and a final written report that the objectives have been met. Both the employer and the student must submit a survey evaluation indicating their perception of the success of the internship. The survey questionnaires submitted by the employer to evaluate the student intern and the survey questionnaire submitted by the student to evaluate the employer's support form the basis of this study.

EVALUATION INSTRUMENT

The survey instruments that provide the responses used in this study were the instruments used University wide for all internships. They were not tailored to individual departments or colleges. The ALC administered all of the surveys and provided the author with copies. The survey instruments completed by the employer and the student should be independent meaning that the employer and the student each completes the survey without knowledge of how the other responded.

Employers are asked to provide feedback on a survey instrument that contains some general background questions and fourteen evaluation questions rating the student intern on a Likert-type psychometric scale. The scale evaluates the student from 1 (Poor) to 10 (Excellent). The questions and the descriptive statistics associated with the responses are summarized and reported in Table 1. Table 1 presents the questions ranked from the highest mean score to the lowest. Employers generally felt that the best characteristic seen in interns was "the ability to accept directions" while employers seemed to think that the possession of prior "knowledge" was the lowest characteristic demonstrated by students. All of the means are above seven which seems acceptable at some subjective level.

**Table 1: Survey Instrument Completed by Employers Evaluating the Student Interns.
(Ranked By Mean Score)**

Question No.	Question on Employers' Survey	Mean	Std. Dev.	Min. Value	Max. Value	First Quart	Third Quart
11	Ability to accept directions	8.978	1.097	5	10	8.50	9.50
10	Enthusiasm & positive outlook	8.843	1.226	4	10	8.00	9.50
2	Dependability	8.685	1.246	4	10	8.00	9.50
13	Resourcefulness in seeking information	8.657	1.233	5	10	8.00	9.50
9	Competence	8.567	1.286	5	10	8.00	9.50
14	Adaptability	8.567	1.407	1	10	8.00	9.50
12	Interpersonal relations	8.416	1.401	5	10	8.00	9.50
5	Ability to work independently	8.388	1.463	4	10	7.75	9.50
3	Communication skills	8.376	1.308	5	10	7.50	9.50
8	Initiative	8.298	1.309	5	10	7.50	9.50
4	Organizational skills	8.267	1.484	4	10	7.13	9.50
7	Ability to make decisions	7.955	1.467	4	10	7.00	9.00
6	Creativity	7.781	1.795	3	10	6.50	9.25
1	Knowledge	7.225	1.603	2	10	6.00	8.25

Student interns are asked to provide feedback on a survey instrument that contains some general background questions. They are also requested to respond to five evaluation questions rating the support they received from their employer on a Likert-type psychometric scale. The scale evaluates the support from 1 (Poor) to 5 (Excellent). The questions and responses are summarized and reported in Table 2. Table 2 presents the descriptive statistics for the evaluation of support questions ranked from the highest mean score to the lowest. All of the means exceed four which provides a clear indication that students were generally highly satisfied with the support provided. Students rated their "opportunity to build skills" the highest and the "orientation to the position" received the lowest rating.

**Table 2: Survey Instrument Completed by Students Evaluating Employers' Support.
(Ranked By Mean Score)**

Question No.	Question on Students' Survey	Mean	Std. Dev.	Min. Value	Max. Value	First Quart	Third Quart
5	Opportunity to build skills	4.663	0.602	2	5	4.0	5
4	Work environment	4.517	0.693	2	5	4.0	5
2	Supervision/Feedback	4.157	1.054	1	5	4.0	5
3	Training received	4.135	1.057	1	5	4.0	5
1	Orientation to the position	4.067	1.064	1	5	3.5	5

DATA CATEGORIES

Using the information on the student's internship application and on the survey instrument, four categories for the data could be developed. The application for the internship contains a great deal of demographic data. The data were collected from eighty-nine internships that were completed between 1995 and 2011. The data have a time dimension (YEAR) that was measured by the year plus an indicator for semester of 1, 2, or 3 representing spring, summer, and fall semesters, respectively.

Internships can involve a wide variety of activities and responsibilities. Sometimes a particular internship will require the student to perform duties in more than one area. However, since the internships are very short-term, virtually all will have a primary set of responsibilities that can be placed into a single category. That single set of

responsibilities allows the internships to be categorized into a variable named TYPE OF INTERNSHIP. The values for TYPE OF INTERNSHIP used in this study are described below.

- *Database Development.* This includes an objective to develop and use a database at any level. It includes those students who developed small, decentralized database applications using software such as Access to students who develop large, enterprise level databases on Oracle or DB2 platforms. It also includes students who intern as DBAs.
- *End User Support.* This includes people whose primary role is to work a help desk and/or respond in some way to user requests for support.
- *Programming.* This includes programming in any language. It does not include those students who have primary responsibilities for database or web development as defined elsewhere. It does include programming for both new development and maintenance.
- *Web Development.* This includes the development of web pages and sites. It usually requires programming in HTML or Javascript.
- *Networking.* This includes all internships that require the development or extensive maintenance of a network. Most of the internships in this category involve the creation of and support for a Windows nt network.
- *Systems Development.* This covers a wide range of activities that are not placed in one of the categories defined above. Internships that are placed here generally require some kind of system design. Normally, an internship placed into this category would not require end user support.

Table 3: Contingency Tables Summarizing the Categories of Survey Data

Type of Internship	Gender			Total	Type of Organization			
	Male	Female	Total		Acad.	Bus.	Gov't	Total
Database Development	6	3	9	1	3	5	9	
End User Support	18	8	26	8	16	2	26	
Programming	9	3	12	0	10	2	12	
Web Development	5	4	9	1	6	2	9	
Networking	9	1	10	3	6	1	10	
System Development	10	13	23	5	15	3	23	
Total	57	32	89	18	56	15	89	

Type of Organization	Gender			Total
	Male	Female	Total	
Academic	9	9	18	
Business	39	17	56	
Government	9	6	15	
Total	57	32	89	

Students complete internships that can be classified by the type of organization that hired them. The variable TYPE OF ORGANIZATION is represented by the domain described below.

- *Government* (including Federal, State, and Local).
- *Business.* This category includes all for-profit business. It also includes three internships that were completed at charitable, not-for-profits organizations.
- *Academic* (including students who worked for K-12, higher education, and vocational).

Finally, the variable for the GENDER of the student intern is defined.

Table 3 presents the contingency tables for three of the different categories of data. The data show a fair representation of internships from a variety of different types of organizations and types of internships. Sixty-three percent of the internships were completed by interns working for private businesses, twenty percent by interns working for academic institutions, and seventeen percent by interns working for governments. Most of the internships (twenty-nine percent) involved end user support followed closely by interns doing system development work (twenty-six percent). Males accounted for sixty-four percent of the internships while females accounted for thirty-six percent. The male to female ratio of majors with the CISBA department is substantially higher than the approximately 3 to 2 ratio of completed internships which suggests that women CISBA majors are more likely to complete internships than male majors. The only category that is not represented is a programmer working at an academic institution.

IMPACT OF STUDENT SURVEY RESULTS ON EMPLOYER PERCEPTIONS

Evaluating the success of an internship can be difficult since the faculty advisor is not on site with the student. The faculty advisor must rely on documents submitted by the student such as a final report and a journal. The surveys submitted by the student's onsite supervisor and by the student are the two documents that allow both parties to report back candidly. The survey responses provide crucial insight into the internship. The employer clearly identifies the strengths and weaknesses of the student allowing the faculty advisor to make a judgment on what the student has learned. The employer's survey responses are generally the most important document the faculty member receives and normally receives the most weight when evaluating the student and the internship. However the student's survey responses also provide valuable insight into the success of the internship. Students would expect to enter the position with a preconceived notion of what a professional work environment would be like. They would expect an orientation to the business environment as well as adequate training for the position. They would expect the onsite supervisor to provide clear guidance on the deliverables and provide timely feedback on the students' progress. The students would also anticipate being provided with opportunities to build a useful skill set. The responses from the employers' survey need to be tempered with the students' survey responses. For example, students who feel they were not given the proper training may receive relatively low responses from their employers. The perceptions of the employer would be associated with the perceptions of the student.

The model used to test the association of the employer response variable to the student response is a one-way Analysis of Variance (ANOVA) model. The one-way ANOVA model tests the significance of the equality of response variable means grouped by the different responses reported for a factor. A more complete treatment of the ANOVA model may be found in Anderson, D.R. et al. (1999) or Groebner, D.F. et al. (2014) as well as many other sources. The model requires that the means of a response variable (employer survey responses) be computed when grouped by the individual responses (5, 4, ... , 1) of a factor (the student survey responses). The model computes an F-Statistic that is used to test if at least one of the computed means is different from the other means. Therefore, there would be statistical evidence that the response of the employer to a question would be, at least in part, impacted by the response of the student.

The model is depicted below.

$$H_0: \mu_{i,j,5} = \mu_{i,j,4} = \mu_{i,j,3} = \mu_{i,j,2} = \mu_{i,j,1}$$

H_A : The means are not all equal.

Where $\mu_{i,j,k}$ indicates the mean employer response identified as follows:

i is the employer response to question i as shown on Table 1. $i = 1, 2, \dots, 14$ (Response Variable)

j is the student response to question j as shown on Table 2. $j = 1, 2, \dots, 5$. (Factor)

k represents the possible score selected by the student on the j th question. $k = 5, 4, \dots, 1$ (Level or Group)

Minitab 17 was used to estimate the above model for all five student survey questions and all fourteen employer questions. The results are presented and discussed in the next section.

RESULTS AND ANALYSIS

Both employers and students completed and submitted their respective evaluations independently. The employer would likely never know the student responses. The student would submit his or her response without knowing the employer ratings. A Pearson correlation matrix was generated among all employer and student responses and is presented in Table 4. The question numbers for employers and students correspond to the question numbers in Tables 1 and 2, respectively. All values in the matrix are positive indicating positive relations among all student and employer responses. For example, the higher a student rated the *orientation to the position*, the higher would be the employer response to all fourteen questions. Generally, the more satisfied the students were with the internship, the more satisfied the employers were with the student. Fifty-one of correlations were statistically significant at the 0.05 level of significance. The responses to the first student question (*orientation to the position*) were significantly correlated with all of the employer responses at the 0.10 level of significance. The student responses to the fourth question (*work environment*) was significantly correlated with the all but one of the employer responses at the 0.10 level as was the student responses to the fifth question (*opportunity to build skills*).

Table 4: Pearson Correlation Matrix with P-Values

Employer Question No.	Student Question Number									
	1		2		3		4		5	
	R	P-VALUE	R	P-VALUE	R	P-VALUE	R	P-VALUE	R	P-VALUE
1	0.268	0.011	0.251	0.018	0.260	0.014	0.247	0.019	0.250	0.018
2	0.265	0.012	0.306	0.004	0.218	0.040	0.269	0.011	0.319	0.002
3	0.271	0.010	0.216	0.042	0.263	0.013	0.241	0.023	0.249	0.018
4	0.282	0.008	0.324	0.002	0.290	0.006	0.268	0.011	0.319	0.002
5	0.224	0.035	0.236	0.026	0.271	0.010	0.288	0.006	0.253	0.017
6	0.243	0.022	0.084	0.431	0.246	0.020	0.092	0.391	0.178	0.095
7	0.297	0.005	0.225	0.034	0.180	0.092	0.219	0.039	0.195	0.067
8	0.259	0.014	0.254	0.016	0.196	0.065	0.204	0.055	0.215	0.043
9	0.242	0.023	0.206	0.053	0.202	0.057	0.292	0.005	0.235	0.027
10	0.182	0.087	0.125	0.244	0.091	0.396	0.184	0.085	0.312	0.003
11	0.357	0.001	0.317	0.002	0.154	0.148	0.367	0.000	0.298	0.005
12	0.217	0.041	0.209	0.049	0.165	0.122	0.286	0.007	0.175	0.101
13	0.252	0.017	0.230	0.030	0.145	0.176	0.283	0.007	0.287	0.006
14	0.194	0.068	0.227	0.033	0.135	0.207	0.244	0.021	0.269	0.011

R is the Pearson Correlation Coefficient Bolded Value Is Significant at Alpha = 0.05

Employer Responses to Student Perception of *Orientation to Position*

The ANOVA results of the employer responses are shown in Table 5. The F-Statistic, the P-Value and the R-Squared are reported. The F-Statistic and P-Value are bolded whenever there is significance at the 0.05 level and are marked with an asterisk whenever there is significance at the 0.10 level. There is rather strong evidence of a statistically significant impact on the employers' perception of the internship when the students' felt they received a strong orientation to the position. Nine of the fourteen employer responses are significant at the 0.05 level with one other being significant at the 0.10 level. Employers' ratings significantly responded to students' ratings in *knowledge, dependability, interpersonal relations, initiative, ability to accept directions, communications skills, and competence* when the students perceived that they received a strong orientation to the position. Interestingly, employers viewed students with a strong orientation as possessing more of the "hard skills" such as knowledge and competence as well as softer skills like dependability and interpersonal relations.

Table 5: ANOVA Results Testing Independence of Employer Responses When Students' responded to the *Orientation to the Position* and *Supervision/Feedback* Questions.

Question	Statistics For Employer Responses					
	<i>Orientation to the Position</i>			<i>Supervision/Feedback</i>		
	F-Stat	P-Value	R-Sqr.	F-Stat	P-Value	R-Sqr.
Knowledge	2.73	0.034	.1152	3.36	0.013	.1381
Dependability	3.89	0.006	.1563	3.37	0.013	.1382
Interpersonal relations	4.45	0.003	.1749	1.70	0.158	.0747
Initiative	2.66	0.039	.1135	2.89	0.027	.1221
Ability to work independently	1.48	0.217	.0657	2.99	0.023	.1246
Creativity	1.38	0.249	.0616	0.73	0.572	.0337
Ability to make decisions	2.41*	0.055*	.1031	1.18	0.327	.0530
Organizational skills	2.50	0.0498	.1063	1.50	0.210	.0667
Adaptability	2.96	0.0248	.1237	1.38	0.248	.0616
Enthusiasm & positive outlook	1.20	0.315	.0542	0.60	0.666	.0276
Ability to accept directions	5.79	0.000	.2161	2.59	0.042	.1098
Communication skills	2.75	0.033	.1157	1.19	0.322	.0536
Competence	2.52	0.047	.1070	1.31	0.271	.0589
Resourcefulness	1.56	0.191	.0693	1.57	0.189	.0697

Bolded Value Is Significant at Alpha = 0.05 * Significant at Alpha = 0.10

Employer Responses to Student Perception of *Supervision/Feedback*

The ANOVA results of the employer responses to student perceptions of sufficient supervision and feedback are reported in Table 5. Five of the fourteen employer responses are significant at the 0.05 level. The evidence suggests that students who receive adequate supervision and feedback are perceived to more effectively *accept directions*, *show initiative* and then possess the *ability to work independently*. The employers' responses of possessing *knowledge* and being *dependable* also are affected significantly by student ratings of adequate supervision and feedback.

Employer Responses to Student Perception of *Training Received*

Table 6 shows the ANOVA results of the employer survey responses when the interns rated their perceptions of the training they received for the responsibilities they were given. Only three employer responses were found to be significantly affected by the student ratings at the 0.05 level of significance. When students perceived that they were provided with more effective training, the employer ratings of students relating to *initiative*, *ability to work independently*, and *adaptability* are significantly affected. The employer response to the *knowledge* question is significant at the 0.10 level.

Employer Responses to Student Perception of *Work Environment*

The ANOVA results for the potential impact of the student perception of the work environment on employer responses are presented in Table 6. The ratings of the work environment questions have a statistically significant effect on eight of the fourteen employer responses at the 0.05 level of significance. When students believed that they were in a favorable work environment, employers responded favorably to questions that involved the hard skills like *knowledge* and *competence*. Employers believed that students demonstrated more *initiative* and were *adaptable*. Employers also thought that students who viewed the work environment more favorably possessed good *communications skills*, were *dependable*, and were *able to work independently*. Five additional employer responses were significantly impacted by the student responses at the 0.10 level of significance. The significantly impacted employer responses include *interpersonal relations*, *creativity*, *ability to make decisions*, *enthusiasm & positive outlook*, and *resourcefulness*. The only employer response that failed to be affected by the students' work environment response at the 0.10 level is *organizational skills*.

Table 6: ANOVA Results Testing Independence of Employer Responses When Students' responded to the *Training Received* and *Work Environment* Questions.

Question	Statistics For Employer Responses					
	<i>Training Received</i>			<i>Work Environment</i>		
	F-Stat	P-Value	R-Sqr.	F-Stat	P-Value	R-Sqr.
Knowledge	2.11*	0.073*	.1126	3.04	0.033	.0970
Dependability	1.51	0.197	.0832	3.81	0.013	.1187
Interpersonal relations	1.80	0.121	.0981	2.17*	0.098*	.0711
Initiative	2.35	0.048	.1254	3.16	0.029	.1015
Ability to work independently	2.55	0.034	.1333	3.10	0.031	.0987
Creativity	1.81	0.119	.0985	2.64*	0.055*	.0852
Ability to make decisions	0.73	0.606	.0419	2.70*	0.051*	.0869
Organizational skills	0.88	0.496	.0505	1.72	0.169	.0573
Adaptability	2.34	0.049	.1235	3.28	0.025	.1039
Enthusiasm & positive outlook	0.78	0.566	.0450	2.42*	0.072*	.0787
Ability to accept directions	0.88	0.496	.0505	5.67	0.001	.1667
Communication skills	0.53	0.752	.0310	3.16	0.029	.1003
Competence	0.69	0.633	.0398	3.60	0.017	.1128
Resourcefulness	0.41	0.841	.0240	2.34*	0.079*	.0764

Bolded Value Is Significant at Alpha = 0.05 * Significant at Alpha = 0.10

Employer Responses to Student Perception of *Opportunity to Build Skills*

Table 7 presents the ANOVA results of the employer response ratings when the students rated their opportunity to build skills provided through the internship. Half of the fourteen employer responses are significant at the 0.05 level. Students who felt they were provided with valuable opportunities to build skills were associated with employer perceptions of being *competent* and *resourceful*. They were also perceived to be *able to work independently*, demonstrate *initiative*, and were *dependable*. Students who perceived that they had opportunities to build skills were also associated with being *enthusiastic* and having a *positive outlook*.

Table 7: ANOVA Results Testing Independence of Employer Responses When Students' responded to the *Opportunity to Build Skills* Question.

Question	Employer Responses		
	F-Statistic	P-Value	R-Squared
Knowledge	2.15*	0.099*	.0707
Dependability	3.32	0.024	.1049
Interpersonal relations	2.58*	0.059*	.0835
Initiative	3.27	0.025	.1045
Ability to work independently	3.20	0.027	.1015
Creativity	1.31	0.278	.0441
Ability to make decisions	1.28	0.285	.0433
Organizational skills	1.62	0.190	.0208
Adaptability	1.84	0.147	.0609
Enthusiasm & positive outlook	3.42	0.021	.1076
Ability to accept directions	3.72	0.014	.1161
Communication skills	1.23	0.302	.0418
Competence	3.21	0.027	.1017
Resourcefulness	2.94	0.038	.0939

Bolded Row Is Significant at Alpha = 0.05 * Significant at Alpha = 0.10

IMPLICATIONS FOR ASSURANCE OF LEARNING

Internships are among the most interesting learning vehicles at the University. Each internship is unique and is defined by its own set of learning objectives. The results of this study might provide evidence that show compliance to the AACSB International's assurance of learning requirements. Each employer offers an individual assessment of the intern that evaluates how well that student intern has met a stated set of learning objectives. (The student must also submit a final report with the faculty advisor clearly demonstrating how the learning objectives were met.) While the results contained in this paper might provide evidence for the measurement of student learning, they also may be used to help *improve* student learning. In the AACSB International standards, using findings to improve student learning is known as closing the loop. Closing the loop is regarded as an important element of assurance of learning. Following are some ways in which the results of this study might be used to improve student learning. The CISBA department is currently looking into ways to implement the following suggestions.

All prospective students who are interested in an internship must attend an orientation seminar conducted by a representative from the Applied Learning Center prior to completing an internship application. The information contained in Table 1 would provide a basis for a discussion of employer expectations. For example, employers tend to view students as enthusiastic, dependable, resourceful, and able to follow directions. However, employers would like to see more creativity, initiative, and decision making from the students. Putting student interns on notice of employer concerns would make for a better and more productive experience for both students and employers.

Employers might also benefit from the results of this study. The results shown in Table 2 might provide valuable insights when disseminated to employers. For example, the importance the students place on the orientation to the position is critical. According to Table 2, students ranked the orientation to the position as the lowest level of support provided by the employers. However, Table 3 suggests that when the students felt that they were provided with a good orientation, the employers rated them higher in all categories. If employers are aware that students want and need a highly structured and detailed orientation, the internship experience may be greatly improved.

Both the Applied Learning Center and the CISBA Department support extensive and informative web sites. References to this study and perhaps a brief summary of the major results might generate interest in the internship program as well as an evaluation of the requirements placed upon the student interns and the employers.

CONCLUSIONS

The analysis of the eighty-nine internships included in this study appear to indicate a highly successful internship program within the CISBA department. The program is robust including internship placements representing several different areas within the information systems discipline. Employers include those in private industry, government agencies, and academic institution. When assessing their student interns, employers mean responses to the fourteen assessment questions ranged from about nine out of ten (*ability to follow directions*) to 7.2 out of ten (*knowledge*). Generally employers rated the softer, behavioral skills higher than the harder, more analytical skills. Students also appear to assess their internship placement favorably. The student means from the questionnaire ranged from about 4.7 out of five (*opportunity to build skills*) to about 4.1 out of 5 (*orientation to the position*).

A correlation matrix generated among the employer and student responses produces results that are always positive and mostly significant. This provides strong statistical evidence that favorable responses from students are associated with favorable responses from employers. One-way between subjects ANOVA calculations were conducted to compare the effects of the fourteen individual employer responses on the five response levels categorized in the student survey rating the students' perceptions of employer support. At the 0.05 level of significance, at least half of the employer responses indicated a significant effect to the student responses relating to the questions of *orientation to the position*, *work environment*, and *opportunity to build skills*. There is also statistical evidence that at some of the employer responses are impacted by the student response to the *training received* and the *supervision/feedback* questions.

REFERENCES

- Anderson, D.R., Sweeney, D.J., and Williams, T.A. (1999). *Statistics for Business and Economics*. 7th edition, South-Western College Publishing: Cincinnati.
- Cook, S.J., Stokes, A. and Parker, R. S. (2015). A 20-year Examination of the Perceptions of Business School Interns: a Longitudinal Case Study. *Journal of Education for Business*. V. 90, pp. 103-110.
- Furco, A. (1996). Service-Learning: A Balanced Approach to Experiential Education. Expanding Boundaries: Service and Learning. *Washington DC: Corporation for National Service*. pp. 2-6.
- Garman, G. (2011). Proposed Model for Analyzing Employer and Student Perceptions of Information System Internships. *The Academic and Business Research Institute Conference Proceedings*. October, Las Vegas, NV. (distributed on CD ROM) .
- Garman, G. (2013). Employer Verses Student Perceptions of Information Systems Internships. *The Academic and Business Research Institute Conference Proceedings*. March, New Orleans, LA. (distributed on CD ROM).
- Gault, J., Redington, and Schlager, T. (2000). Undergraduate Business Internships and Career Success: Are They Related? *Journal of Marketing Education*. V. 22, No. 1, pp. 45-53.
- Gault, J., Leach, E. and Duey, M. (2010). Effects of Business Internships on Job Marketability: The Employers' Perspective. *Education & Training*. V. 52, No. 1, pp. 76-88.
- Gosen, J. and Washbus, J., (2004). A review of scholarship on assessing experiential learning effectiveness, *Simulation and Gaming*. June V. 35, No.2, pp. 270-293.
- Groebner, D.F., Shannon, P.W., and Fry, P.C. (2014). *Business Statistics A Decision-Making Approach*. 9th edition, Pearson: Boston.
- Michael Hergert. (2009). USA Student Perceptions of the Value of Internships in Business Education. *American Journal of Business Education*. November. V. 2, No. 8, pp. 9-14.
- Mielke, P. W. and Berry K. J. (1982). An extended class of permutation techniques for matched pairs. *Communications in Statistics - Theory and Methods*. V. 11, No. 11, pp. 1197-1207.
- Moghaddam, J. M. (2011). Perceived Effectiveness of Business Internships: Student Expectations, Experiences and Personality Traits. *International Journal of Management*. V. 28, No. 4, pp. 287-303.
- Rexisen, R.J. and Garrison, M.J. (2013) Closing-the-Loop in Assurance of Learning Programs: Current Practices and Future Challenges, *Ethics and Business Law Faculty Publications*, Paper 50.
- Tucker, M. L, McCarthy, A. M., Hoxmeier, J. A., and Lenk, M., (1998). Community Service Learning Increases Communication Skills Across the Business Curriculum. *Business Communication Quarterly*. V. 61, No. 2, pp. 88-99.
- Updyke, K. A. and Sander, J. (2005). A Survey of AACSB Accredited Institutions and the Use of Work Experiences as Part of the Business Curriculum. *Journal of the Academy of Business Education*. V. 6, pp. 118 -126.

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