The Status Quo and Future of the Off-Campus Internship Programs for Students in the Departments of Electronic Engineering and Information

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Abstract

Off campus internship has been regarded as an important facet of the industry-university collaboration for the education of the students. Its major purpose is to promote students' competitiveness and know-how in the future job market. Currently, among all the colleges and universities, the highest number of professional talents is trained in the department of electronic engineering and information science. Therefore, this research regards the chairs of the departments of electronic engineering and information science in various colleges and universities in Taiwan as objects of study. Investigated by questionnaires, it examines the current conditions of the practice of off-campus internships in various institutes of technology and universities of science and technology. The questionnaires, totally 101, were sent at random, and 71 were returned, for a response rate was 70%. Eventually, the findings indicated that more students conducted off-campus internship when they were juniors and seniors. Most students received 3 credits or more from their internships. The institutions of internships were mostly private companies arranged by the departments. Regarding the time for off-campus internships, most of them did it during the semester or summer vacation. More importantly, it was greatly helpful for the students to cultivate their professional and non-professional know-how. There were three recommendations were proposed. They have to adapt their attitude before been there and finish their task when they attend internship. After finish internship period, they have to finish their final report in the future.

Introduction

Accounting and Statistics, Executive Yuan on January 22, 2013, unemployment rate of young people in Taiwan (15-24 years old) was 12.66% and it was 3 times of the total average. Unemployment rate of university and above was 4.58%. Accordingly, many technological universities & colleges and industries are devoted to students' off-campus internship to allow students to have basic competency in workplace before graduation in order to effectively solve the problem.

Off-campus internship is regarded as an important channel for acquiring actual work experience (Barrows & Bosselman, 1999). It is also an activity for students to work in an actual work environment (Neill & Mulholland, 2003). Beggs, Ross, & Goodwin (2008) mention that it is necessary to allow students to review their career development during their internships and feel and complexity of the job market. In the milieu of the red-hot competitiveness in the labor market, the development of higher vocational education influences the enhancement of the country's competitiveness significantly.

Learning in internships, they can be cultivated to promote their own innovative abilities and competitiveness. More importantly, they can put the theories they learned at school into practice. Simply put, students can accumulate their work experience during their internship so that they can know more about their strengths and weaknesses and make up their deficiencies in their education as soon as possible to enhance their competitiveness in the job market or start their own businesses (Chen, Chang, & Hsiao 2007).

Chen et al. (2007) suggests that, based on the principle of complimentary resources and the sharing of resources, it is possible to establish the system of learning for students through industry-university collaboration to achieve triple-win collaboration. Likewise, students can obtain experience in the workplace at an earlier time to promote their competitiveness in the job market. Perhaps, it may be helpful to them in job seeking as soon as they graduate.

It is clear that the schools' active promotion of off-campus internship is beneficial to students, schools, and enterprises. Therefore, this research intends to know more about the conditions of off-campus internship conducted by institutes of technology and universities of technology with the chairs of the departments of electronic engineering and information science as objects of study.

Tested by questionnaires, it aims to explore the current conditions of off-campus internship of the students major in electronic engineering and information science in Taiwan.

Literature Review

Definition and purpose of off-campus internship for students

In order to plan educational trainings and cultivate talents, schools implement a series of measures in accordance with the policies. In a narrow sense, it is the collaboration between academia and industry. Through off-campus internships, students can have the opportunities to put the theories they learned at school into practices in different workplaces to enhance the results of learning and teaching. Internships are also regarded as the collaboration between the university and industry aiming to cultivate students' competitiveness (Alpert, Heaney, & Kuhn, 2009). Examining these definitions regarding off-campus internships, it emphasizes collaboration– the alliance between the school and the internship institute. Providing students with better education resources, it will be beneficial in their future career planning.

The "Guidelines for the Opening of Off-campus Internship Courses in Institutes of Technology and Universities of Technology," the Ministry of Education (2009), encourages institutes of technology and university of technology to open off-campus internship courses to achieve the following goals:

1. Allow students to experience the workplace at an earlier time in order to cultivate a proper working attitude
2. Increase practical teaching resources at schools and job opportunities for students
3. Minimize the enterprise's cost in orientation training and reserve potential employees.

Off-campus internships allow students to obtain work experiences in workplaces at an earlier time. As result, they can make career planning as soon as possible. Seeking job opportunities of their interests, they can shorten in time in job hunting. In addition, schools can increase their teaching resources and narrow down the different between academy and industry. According to the research of Hite & Bellizi (1986), the students highly valued the off-campus internship experience and recognized that it is highly conducive to their future career development. Students also believe that off-campus internships are helpful to their futures. According to the project of Lucas,

Cooper, Ward, & Cave (2009), British students feel more confidence, and know more about business operations and skills when returning to schools from their internship venues. Therefore, the design of off-campus intern courses should be closely related to the industry so that students can learn more about professional knowledge and skills (Aggett & Busby, 2011).

Implementation of off-campus internship

In the "Guidelines for the Opening of Off-campus Internship Courses in Institutes of Technology and Universities of Technology" (2009) announced by the Ministry of Education, it mentions that off-campus internships are either required or elected courses opened by institutes of technology or universities of technology, enumerated as follow:

Summer courses. Open off-campus courses with 2 credits or more. Students must participate as an intern in a single enterprise for 8 consecutive weeks at the minimum of 320 hours, including the scheduled forums and seminars at schools.

Semester courses. Open off-campus courses with 9 credits or more. Students must participate in an off-campus internship for 4.5 months or more. During the period, other than participating in the scheduled forums and seminars at schools, students must work full-time at the intern institutes.

Academic year courses. Open off-campus courses with 18 credits or more. Students must participate in off-campus internships for 9 months or more. During their interns, other than participating in the scheduled forums and seminars at schools, students must work full-time at the intern institutes.

Medical and nursing courses. During the semester, students attending a four-year college or five-year junior college must take 20 credits or more in off-campus intern courses. Students attending two-year junior technical college or two-year junior college must take 9 credits or more in off-campus internship courses. The hours of off-campus internship can be accumulated in accordance with the rules and regulations of different medical and nursing departments.

International internship courses. 1. International internship courses should either be semester courses or academic year courses. 2. The venues of internship should be areas other than China or on-board of ocean liners in international waters. Moreover,

first priorities should be given to the advanced or potential enterprises (including branches) operated by Taiwanese investors globally. 3. Students participate in these programs should pass professional tests and language proficiency tests. The intern institutes should be reviewed and accredited by the schools. More importantly, the work in the internship should be related to students' majors.

When planning off-campus programs, the schools should arrange suitable courses in accordance with students' practical needs because the time for taking these courses, the credits earned, and the requirements vary. Only by taking courses planned appropriately, can the students understand workplaces better to accomplish the goals of internship.

Current conditions of off-campus internships for students

Executive Yen (2013) pointed out the achievements of Phase I of the "Technological-Vocational Education Reshaping Project" are exposed as follow:

The number of funded internship students and actual number of internship students in 2010-2012.

In 2010, the Ministry of Education funded 8,510 students studying at institutes of technology or university of technology to engage in off-campus internships. Nevertheless, the actual number of student that participated in off-campus internships was 38,273, occupying 22.4% of the graduates in 2009 academic year. In 2011, the Ministry of Education funded 8,217 off-campus internship students studying at institutes of technology or university of technology, and the actual number of students that participated in off-campus internships was 42,408, occupying 26.3% of the graduates in 2010 academic year. In 2012, the Ministry of Education funded 8,368 students studying at institute of technology or university of technology to engage in off-campus internships, and the actual number that participated in off-campus internships was 53,774 occupying 32.6% of the graduates in 2011 academic years.

Ratio of off-campus internship courses opened by academic departments in 2010-2012.

After the launching of Phase I of the "Technological-Vocational Education Reshaping Project," the number of off-campus internship courses increased significantly in the institutes of technology and universities of technology in Taiwan. Up to 2012, about

85.3% of the academic departments opened internship courses, indicating that the funding of the government institutions enhanced the intentions of the schools to implement internship significantly.

According to the literature above, after the implementation of the Phase I of the "Technological-Vocational Education Reshaping Project" by the Ministry of Education, there had been a significant increase in the number of schools implementing off-campus internships, indicated in the increase in the actual number of students and academic departments participated in internships.

Method

In this research, questionnaires were used as the research method, with the departments chair in information science in Taiwan as objects of study. Questionnaires were sent at random. The questionnaire was complied with the questionnaire developed by Thompson (2011). This questionnaire, in English, was used to survey the conditions of off-campus internships in the department of accounting. In this project, the questionnaire was translated into Chinese and adapted to suit the purpose of this study. The questionnaire consisted of two parts. First was the basic information, including teaching seniority, with working seniority or not, affiliations, and the number of students at day school, of the participants.

Second was the conditions of off-campus internships, including whether were there students participating in off-campus internships or not, were there any particular requirements for students participating in off-campus internships, the year the students participated in off-campus internships, the number of students in a department that participated in off-campus internships, kinds of institutes for off-campus internships (government institutions, private companies, and family companies), how to obtain the opportunity for off-campus internships (sought by students, arranged by departments, arranged by schools' business departments, and recruited by enterprises), manners of off-campus internship, credits for off-campus internship, accumulated credits for off-campus internships, items to be completed after internship, was off-campus internships required or elective courses, duration of off-campus internships, was it helpful for students to participate in off-campus internships, the degree of help for students participated in off-campus internships (work in professional discipline, work in non-professional discipline, and understand the condition of workplaces), whether the department certified by IEET or listed as Grade 1 in Assessment and Evaluation for Universities of Science and Technology,

and the highest degree offered by your department. After the questionnaires were collected, they were analyzed by SPSS to examine the current conditions of off-campus internship for the students in the institutes of technology or universities of technology in Taiwan.

Data analysis and discussion

The samples of the questionnaires were completed by the chairs in the departments of information science in investigate the current conditions of the implementation of off-campus internship programs. In accordance with the survey of the Ministry of Education, there were 59 institutes of technology and universities of technology in Taiwan that had departments of information science and related disciplines. There were 144 chairs working in the department of information science and related disciplines. 101 questionnaires were sent, with 71 returned, for a recovery rate of 70%.

Sample and background analysis

The analysis of the sample data regarding the department chairs are listed in Table 1. The variables of the department chairs in this study are consisted of four items: teaching seniority, working seniority, affiliations, and the number of students at day school in 2012 academic years.

Table 1 Analysis of personal background samples and variables

Background variables	Items	Quantity	Percentage (%)
Teaching experience	5 years (inclusive) or less	1	1.4
	6-10 years	6	8.5
	11-15 years	17	23.9
	6 years (inclusive) or more	47	66.2
Working experience	Nil	17	2.9
	5 years (inclusive) or less	42	59.2
	6-10 years	7	9.9
	11-15 years	2	2.8
	16 years (inclusive) or more	3	4.2
Affiliations	College of electronic engineering	5	7
	College of information science	37	52.2
	College of engineering	29	40.8
Number of students in the day school in 2012	100 or less	3	4.3
	101-200	11	15.5
	201-300	13	18.3
	301-400	17	23.9
	400 or more	27	38.0

Analysis of students that participated in off-campus internships

As shown in Table 2, from the questionnaires completed by the chairs, there are 69 departments that have implemented an off-campus internship program, occupying 97.2%. There are 52 departments that require students to participate in internship programs, occupying 75.4%. Most participate in internship in their junior years. In the 2012 academic year, most of the departments had 1-10 students joining the off-campus internship program, scoring the highest at 27.5%, in which 92.7% of students can earn credits from their internships. 12.5% of the students should turn in their reports on the internship after its completion. 7.8% of the students should complete the tasks required by the internship institutes, and 79.7% of them should turn in their reports on the internship after its completion.

In addition, there are 27 departments that regard off-campus internship as required courses; 37, elective courses. The duration of the internship ranges from 1 to 3 months, occupying 31.3%; from 3 to 6 months, 34.3%; and 6 months or more, 32.9%.

Table 2 Frequency of students engaging in off-campus internships

Background variables	Item	Quantity	Percentage (%)
Are there any students participating in off-campus internships?	Yes	69	97.2
	No	2	2.8
Are there any basic requirements to the students participating in off-campus internships?	Yes	52	75.4
	No	17	24.6
What is the level of students participating in off-campus internships in your department?	Freshmen or above	6	11.6
	Sophomore or above	10	1.9
	Junior or above	17	32.7
	Senior	14	26.2
	Graduate	0	0
	Nil	5	9.6
How many students participated in off-campus internships in 2012?	1–10	19	27.5
	11–20	16	23.2
	21–30	15	21.7
	31–40	5	7.3
	More than 40	14	20.3
Can students earn any credit from off-campus internships?	Yes	64	92.7
	No	5	7.3
How many credits in accumulation can students earn from off-campus internships?	0 credit	1	1.6
	1 credit	0	0
	2 credits	7	10.9
	3 credits	12	18.8
	3 credits or above	44	68.7
After completing	Turn in reports	8	12.5

off-campus internships, what are the items required to be fulfilled?	Requirements of the internship institutes and evaluations	5	7.8
	Both of the above	51	79.7
Your department regarded off-campus internship as:	Required courses	27	42.2
	Elective courses	37	57.8
In you department the duration of off-campus internships are	1 month or less	1	1.5
	1 to 3 months	20	31.3
	3 to 6 months	22	34.3
	6 months or above	21	32.9
Does your department hold any of these certifications?	IEET certification	19	26.8
	Class 1 in Evaluation of Universities of Technology	9	16.7
	Both of the above	29	40.8
	None of the above	14	19.7
What is the highest degree offered by your department?	Bachelor's	18	25.4
	Master's	45	63.4
	Doctor's	8	11.3

Manner of seeking internship institute

In this section of the questionnaire, a Likert 5-scale point system is used. From 5 point to 1 point, it indicates the conditions in accordance with their frequencies. In Table 3, the score of government institutions is 1.12; private enterprise, 4.61; and own companies, 1.71, indicating that most of the students conducted their off-campus internship in private companies, with own companies coming second, and government institutions the least. Regarding the manner of seeking off-campus internship opportunities, it shows that arranged by the departments and business' recruitment score the highest at 4.09 and 3.05 respectively; the lowest was arranged by the schools' business sections and sought by students themselves. It also indicates that most of the students' off-campus internship opportunities are arranged by the departments and recruited by the enterprises in Table 3.

Table 3 Features and the seeking of off-campus institutes

Items	Questions	Average	SD
Off-campus internship institutes of students	1. Government institutions	1.12	.385
	2. Private enterprises	4.61	.752
	3. Own companies	1.71	.935
Ways of students seeking off-campus internship opportunities	1. Sought by students	2.27	1.105
	2. Arranged by departments	4.09	1.011
	3. Arranged by schools' business departments	2.78	1.284
	4. Enterprise recruitment	3.05	1.025

Time for students engaging in off-campus internship

Depending on the schools, the planning of off-campus internship differs. Moreover, schools provide different time slots for students to participate in off-campus internships. Meanwhile, some schools even provide students with two or more times slots to participate with internship programs so that they can take these courses at times convenient for them. In Table 4, the distribution of time slot for off-campus internship is listed.

Table 4 Distribution for time slots for students' off-campus internship

Item	Coefficient	Percentage (%)
1. During the semester	51	73.9
2. Winter vacation	11	15.9
3. Summer vacation	59	85.5
4. After school	3	4.3

Analysis of benefits for students' participation in off-campus internship programs

According to Table 5, regarding the analysis of the conditions of the off-campus internships, it indicates that most department chairs believe that off-campus internships are helpful to students' future careers.

Table 5 Analysis of the conditions of students' off-campus internship

Background variables	Item	Coefficient	Percentage (%)
Do you think is it helpful for students in their future careers to participate in off-campus internships?	Yes	71	100
	No	0	0

Table 6 indicates that the scores for promoting students professional performances, promoting students' non-professional performances, and allowing students to understand more about the conditions of workplaces are 4.18, 4.00, and 4.53.

Table 6 Analysis of department chairs recognition of the benefits for students participating in off-campus internship

Questions	Average	Standard deviation
1. Can promote performance in professional field	4.18	.487
2. Can promote performance in non-professional field	4.00	.561
3. Can allow students understand more about the conditions of workplaces in their fields	4.54	.502

Conclusions and recommendations

This research examined the conditions of conducting off-campus internship programs in institutes of technology and universities of technology with questionnaire as method in order to understand the current conditions of conducting off-campus internship programs in institute of technology and universities of technology in Taiwan with the conclusions as follow.

Conclusions

Most of the students that participated in off-campus internship are junior and senior students.

According to the research findings, most of the students that participated in off-campus internships are junior and senior students. It is deduced that freshmen are still trying to get familiar with the schools when they just enrolled. Regarding sophomores, they are still taking required courses in their disciplines.

Most students can earn 3 credits or more after the completion of off-campus internship courses.

For students, credits required for graduation are very important. Therefore, if the credits they earned from off-campus internship courses are too low, they will not have sufficient motivations in participating. Likewise, many schools offer three credits or more for students completing the off-campus internship courses to promote their motivations.

Most students participated in off-campus internship programs work in private enterprises arranged by their departments.

Most off-campus internship institutes are arranged by their departments. The major factor is that when the students participate in off-campus internship, most of the resources are provided by the departments. In addition, most of the off-campus internship institutes are private enterprises. Very few works in government institutions.

The time for students' off-campus internship is concentrated mostly during the semester or summer vacation.

According to research findings, most schools arrange off-campus internship courses during the semester or summer vacation mainly because they hope the students can have continuous and prolonged periods to work and learn in internship institutions to have more complete understanding of workplaces.

Helpful to the students participated in professional and non-professional fields in off-campus internship.

According to research findings, many department chairs think that it is helpful for students in their performances in both professional and non-professional fields in the future. In addition, it allows students to understand more about the conditions of workplaces in their fields. All department chairs have positive attitudes towards the benefits of off-campus internship.

Recommendations

Students should adapt their attitude before joining off-campus internship.

Before entering off-campus institutes, students should be fostered to be initiative, positive and self-motivated, it is important to change attitudes and behaviors. As a result, students will work well with others and able to work diligently during internship.

Students should finish their tasks when attending internship.

It is important that students supposed to finish tasks or missions given by off-campus advisors or mentors, through the time that students put all efforts focusing onto the tasks, they learn not only professional skills but also experiencing workplace environment. It is a great opportunity to foresee the situation of future employment.

Students should accomplish final report after the end of internship.

When finishing off-campus internship, students are required to make a final report regarding the reflections of being interns, any achievements during internship and introduction of off-campus institutes. From the assignments, students could oversee every details of internship, it is provided as key information that they can start to plan for own future career, and will be benefit when making decisions on employment.

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