

COMPARISON OF EFFECTIVENESS BETWEEN TRADITIONAL AND INDUSTRY-BASED GRADUATE ASSISTANTSHIPS

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Abstract

Traditional graduate programs prepare students for research careers. However, with growing opportunities from an evolving global society, many graduates choose non-research careers. This study assessed potential benefits between two graduate assistantship programs: a traditional research/teaching based assistantship and an industry partnership assistantship. Assistantships were evaluated based on five aims [1] for effective cooperative education programs: (1) get firsthand knowledge while executing projects assigned, (2) become familiar with problems and viewpoints of the workforce, (3) test career aptitudes, (4) achieve gradual transition from academics to the work world, and (5) train for higher administrative and operating functions. Sixteen respondents from a qualifying pool of 36 students (44% response) completed a survey of 48-51 statements based on the five aims. Eleven respondents held a traditional assistantship, and five held an industry partnership assistantship. The findings were consistent with Freund's five aims. Four of five industry partnership assistantship respondents felt very confident that they will be able to manage and execute projects when employed full time and that their tasks always or frequently had professional value. The benefits of the industry partnership assistantship were: greater exposure to the work world, hands-on experience, relation to professional goals, improved managerial skills, and smoother transition from academics to full-time work. The traditional assistantship benefits were: improved time for thesis work, an environment conducive for student responsibilities, less commuting time, and more contact with advisors and professors. Based on the study's findings the ability for either program to be truly beneficial depends on the student's career goals.

1. Introduction

The training and education of graduate candidates is in need of transformation [2-4]. There are more graduates than there are academic and research jobs, and recent graduates find the transition to other types of jobs extremely difficult [3]. Although these students are technically competent, the skills they possess are too specialized. They spend so much time in the research and academic setting that most of them lack the skills or necessary experience to transition into industry. Most PhDs never obtain jobs at research universities, yet their training is focused

precisely toward such positions [2]. In fact, presently, two-thirds of graduates who have obtained PhDs in the labor force are not working in their area of training [3]. Job opportunities outside academia indicate that changes in graduate education need to be adopted [5].

Coate and Leonard [6] argued that the PhD does not provide appropriate professional development for those who go into industry. Companies report their discontent with the graduates that they employ, stating that graduate students possess strong technical research competence but lack the communication, teamwork and interdisciplinary skills necessary to excel [2-3]. Greene et al. [3] argued that graduate students should be trained for versatility. The process to increase versatility and in turn employability should involve nonacademic professionals. Jon Armstrong, former Vice President for Science at IBM, proposed that students seek internships that develop technical work experience [3]. In summary, the PhD program must do much more to equip its holders for industry jobs [4].

Cooperative education programs, internships, placement programs and other work experiences are needed to help recent graduates increase versatility and in turn employability. Research casts doubt that employability skills can effectively be developed in the classroom [7]. Cooperative education may provide a solution by allowing graduate students valuable hands-on work experience applicable to their field of study. Freund [1] detailed 5 specific aims of cooperative education that are still embraced today, which are discussed below.

1.1. Firsthand knowledge while executing projects assigned

The Career Research Advisory Centre (CRAC) in the United Kingdom and the Association of Graduate Schools in the United States have advocated that PhD students be introduced to company culture before they join the job market [5]. This introduction will enable students to gain some firsthand experience in either the academic or corporate arena, dependent on their desired career path. However, these recommendations have not been implemented, as evidenced by Magner's [2] documentation of continued dissatisfaction of graduate students and Golde's [2] findings that graduate students do not feel prepared for life outside of research universities. Mandansky [8] suggests that the PhD be reformed to include greater attention to teaching skills, since most academic jobs in the USA are in teaching, not research.

1.2. Familiar with the problems and viewpoints of the workforce

The arena in which graduate students will work is a constantly evolving, globalized, diverse work setting. They must prepare themselves and be familiar with the problems and viewpoints currently faced by the workforce. Even more, the message from many industry employers is that although PhD students are technically competent, they are too specialized, they are unable to work in multidisciplinary projects and they have little or no experience with teams in the business environment [3, 5].

1.3. Aptitudes for their chosen careers

Cooperative education confirms or redirects career decision making [9] by applying theoretical principles to practical and scientific applications. The traditional graduate TA/RA experience can be valuable preparation for aspiring academics [10], but not those entering industry.

1.4. Gradual transition from academics to the work world

Structured work experience, employer involvement in degree course design and delivery has a positive effect for graduates in their ability to find graduate level jobs within six months post graduation [7].

1.5. Train and prepare for higher administrative and operating functions

Business leaders complain that new PhD's cannot communicate [2]. Emphasis should be placed on the development of communication skills (written and oral) and vocational courses introducing subjects concerned with management, economics, etc. that are not a part of the PhD area of research [5].

1.6 Aim of Study

Most research argues that graduate education and training is outdated and should be reformed [2-3, 5]. Training for versatility seems to be a common theme; connecting students and the sectors in which they are likely to become employed [3]. Other research has explored the preparation, training, supervision and mentoring, personal and professional development issues of graduate teaching assistants in North America [10], and these themes currently provide the base of several graduate programs across the country. Previous studies focused on PhD programs; the current study will go beyond that and include the master's program as well. This study aimed to identify and assess potential benefits between two graduate assistantship programs: a traditional research/teaching based assistantship and an industry partnership assistantship. The benefits are measured in terms of meeting the five aims of cooperative education, which is hypothesized to be the keys in preparing graduates for non-academic careers.

2. Methods

2.1 Participants

Following approval of the study by the Institutional Review Board (IRB), all graduate students that held an assistantship in the Construction Management and Industrial Engineering (CMIE) Department were invited to participate in the study. The department supports two types of assistantships. The first type is an on-campus assistantship (traditional TA or RA). The second type is a relatively new off campus program that the department established with Ochsner Health System in January 2008. Through an interview process five students are selected every semester to work on specific projects for Ochsner. The students work two days per week and Ochsner provides housing for those two days if required to travel.

A total of 36 students were invited to participate: 8 from PhD in Engineering Science (PES), 10 from M.S. in Engineering Science (MES), and 18 from M.S. in Industrial Engineering (MIE). The response rate was 44% (16 of 36, Table 1). Eleven of 16 students (68.8%) held an on-

campus assistantship (traditional), and 5 of 16 (31.3%) held an off-campus assistantship at Ochsner (OHS).

Table 1 Graduate Student Demographics

Assistantship Location	Participants	Mean Age (SD)	Gender		US Resident	
			Male	Female	Yes	No
Traditional	11	25.2 (2.8)	7	4	4	7
Ochsner (OHS)	5	24.8 (2.5)	5	0	1	4
Total	16	25.1 (2.6)	12	4	5	11

2.2 Survey

The survey included 48 questions in five sections – demographics, work supervision, co-workers, professional development and general questions. Surveys were distributed and completed online in 4 weeks. To ensure confidentiality, all participants provided consent by clicking a radio button indicating consent to participate. The demographics section (4 items) provided information on assistantship location, age, gender, and citizenship status. The work supervision section (5 questions) covered students’ familiarity with the workforce and mentoring aspects. Five items regarding working in teams and firsthand experience with projects were covered in the co-workers section. The last two sections, professional development (15 items) and general questions (19 items) covered a wide range of questions on students’ aptitude, higher level training, the transition between their academic preparation, and their assistantship position as well as additional questions regarding fringe benefits. From this survey, 10 specific questions coinciding directly with the five aims introduced by Freund (1946) were used in the analysis for this paper. Responses to these 10 questions followed a Likert-type scale format. Each response category was assigned a number based on an interval scale (e.g. never=1, seldom=2, sometimes=3, frequently=4, and always=5). The categories varied for each question.

2.3 Statistical Analysis

All of the responses were converted into scores as described in the Survey section. Modes were expressed in the same scales. The percentage of responses and p-value of differences between the traditional and OHS assistantships are shown in Table 2 for each of the questions that were evaluated using the Mann-Whitney Test. Statistically significant differences were accepted at $p < 0.05$.

3. Results

The results presented are organized according to the five aims of cooperative education discussed previously, with numbers in parentheses corresponding to the question in Table 2.

3.1. Get firsthand knowledge while executing projects assigned

There was no significant difference observed between the two groups in obtaining firsthand knowledge while executing their assigned projects. The students differed slightly on the perspective of adequate workload (1). The workload for traditional assistantships was always

adequate (mode=5) whereas OHS workload was seen as frequently adequate (mode=4). Both groups, traditional (mode=5) and OHS (mode=5), felt the work they were performing always was of professional value (2). The OHS group felt completely confident (mode=5) in their ability to manage and execute projects post graduation (3) in comparison to the traditional group who felt very confident (mode=4).

3.2. Become familiar with the problems and viewpoints of the workforce

Both groups felt comfortable with becoming familiar with problems and viewpoints of the workforce (no significant differences between groups). At least 60% of both groups felt they were given adequate supervision regarding projects. With regards to work supervision (4), the traditional group (mode=5) felt that adequate explanation was always given to them concerning what was expected of them and the nature of the tasks assigned to them. The OHS group revealed that direction was frequently (mode=4) given to them. Consistent with what is typical of research, the traditional group (mode=3) reported that team work was only used sometimes (5). The OHS (mode=3) group also reported that teamwork was used sometimes. Both groups agreed that mentoring was helpful (6). 82% and 60% of traditional and OHS groups respectively were assigned mentors, and 73% and 80% respectively found mentoring to be helpful.

3.3. Test aptitudes for their chosen careers

Most students reported the work assigned to them was directly related to their degree and that it was good experience in relation to their career goals. The comparison between the two groups showed no significant difference. Both student groups felt that the work assigned to them was frequently directly related to their graduate degree (traditional mode=4, OHS mode=4, question 7). The traditional group (mode=4) applied theory learned in the classroom more than the OHS group (mode=3) who only used theory sometimes (8). The overall evaluation of work experience by both groups in relation to their career goals was good (9), traditional (mode=4) and OHS (mode=4).

3.4. Achieve gradual transition from academics to the work world

In the traditional group, 29% of the students reported that their employer provided them with a professional training session, while none of the students in the OHS group reported training being provided by the employer. No significant difference ($p=0.260$) was found between the two groups.

3.5. Train and prepare for higher administrative and operating functions.

Both groups reported no change in their communication skills before and after working (10). The traditional group (mode=5) reported excellent communication skills prior to starting and after working. The OHS group (mode=4) reported good communication skills prior to and after working.

4. Discussion

The study compared responses to questions regarding two assistantship programs, based on the 5 aims introduced by Freund [1]. The first aim is for students to get firsthand knowledge on the execution of projects, which all students reported being met. The OHS group was assigned real projects; their analysis, data, studies, and reports are of professional value. 80% of the students felt very confident that they will be able to manage and execute projects when employed full time. On the other hand, only 63.6% of traditional assistantship students felt very confident about it. Almost half (45.5%) of the traditional group felt that sometimes-seldom tasks assigned had some professional value, while 80% of the OHS group felt that their tasks always if not frequently had professional value.

Training and preparing students for higher administrative and operating functions is the fifth aim. As students reflected in the survey, the OHS group showed greater opportunity to practice and refine interpersonal skills. Students in both programs recorded improvement in communication skills after their assistantship experience. 80% of the students in the OHS group believed that they had improved their managerial skills, while only 54% of the traditional assistantship students believed so.

Overall, both assistantship programs have their benefits as well as their shortcomings. The OHS program's greatest benefits were greater exposure to the work world, hands on experience, relation to professional goals, improvement of managerial skills, and smoother transition from academics to full time work. The traditional program's benefits were: improved time to work on thesis, a more conducive environment for student responsibilities, less commuting time, and increased time on campus which allows more contact with advisors and teachers. Besides the learning benefits, there is also monetary compensation and fringe benefits that students obtain, following the LSU policy on assistantship programs as forms of financial aid. Both groups are compensated on the same net scale; OHS students receive reimbursement to offset the cost of travel. Though, some students believe the compensation is not sufficient based on the workload that they are assigned. This assessment is supported by Adams & Mathieu (1999) who wrote that PhD students are serving as a support function rather than getting an optimal and well structured preparation to employment outside the University.

The second aim is to get familiar with the problems of professionals by obtaining real world experience. Students working at Ochsner faced the same workload, time constraints, and pressures as employees during their two work days. Teamwork and individual work was required at Ochsner, as is common in real work life scenarios. 60% of OHS students responded teamwork was utilized at least sometimes, in comparison to the thirty-percent of traditional assistantship students who responded in the same manner. 80% of students at Ochsner had the opportunity to be group leaders frequently or always whereas on-campus assistantship students were seldom or sometimes group leaders (54%). OHS students appear to have greater availability to do group work to complete assigned tasks. The traditional assistantship students were rarely given opportunities to lead groups, because most of their work is independent. A large percentage of students in both groups traditional (82%) and OHS (60%) were assigned mentors and found their mentors to be helpful.

Table 2. Percentage of traditional and Ochsner (OHS) assistantship survey responses grouped by Likert-scale group

Question		<i>Always</i>	<i>Frequently</i>	<i>Sometimes</i>	<i>Seldom</i>	<i>Never</i>	P value
(1) From your perspective, was the work load adequate to keep all the working students busy	traditional	55	18	27	0	0	0.467
	OHS	20	60	20	0	0	
(2) How often did you feel the work you were performing was of professional value	traditional	45	9	27	18	0	0.632
	OHS	40	40	20	0	0	
(4) Was adequate explanation given to you concerning what was expected of you and the nature of tasks assigned	traditional	64	18	18	0	0	0.111
	OHS	20	40	20	20	0	
(5) How often was teamwork used	traditional	18	9	36	7	27	0.284
	OHS	20	20	60	0	0	
(7) Was the work you were assigned directly related to your graduate degree	traditional	27	27	18	18	9	0.517
	OHS	20	60	20	0	0	
(8) How often do you apply theory learned in class in your everyday work	traditional	9	36	27	27	0	0.810
	OHS	0	40	60	0	0	
(3) When you graduate and start full time employment, how confident are you in your ability to manage and execute projects	traditional		<i>Completely</i>	<i>Very</i>	<i>Somewhat</i>	<i>Not Very</i>	0.258
	OHS	27	36	27	9	0	
(9) What is your overall evaluation of this experience in relationship to your career goals	traditional		<i>Excellent</i>	<i>Good</i>	<i>Average</i>	<i>Below Average</i>	0.764
	OHS	27	36	27	9	0	
(10) How would you rate your communication skills before your working experience	traditional	45	36	18	0	0	0.195
	OHS	0	80	20	0	0	
(10) How would you rate your communication skills after/ during your working experience	traditional	55	45	0	0	0	0.602
	OHS	40	60	0	0	0	

The third aim is to test aptitudes for chosen careers. The OHS assistantship serves as an evaluating tool for students to see if their area of study matches career goals. 80% of the OHS students believed that most of the work performed was related to their graduate degree and that the experience had a good or excellent relation to their career goals, while only 54% of traditional assistantship students believed so.

The fourth aim is the gradual transition from the academics to the world work. Although a large number of students reported they were not provided with professional training sessions, their individual assistantship programs provided some transition. OHS students gained work experience for two days a week, which provided a gradual transition, going from students to part-time employees to later become a full time employee with many responsibilities. The traditional assistantship students also experience this transition because they have responsibilities and assignments with deadlines. Both programs evaluate the performance of the students and their work as the basis for continuation just as the performance evaluation of full time employees is used to determine value and evaluate the extension of employment.

Although the differences between both groups were found to be statistically insignificant from the data analysis, it was concluded that there is a need for further study regarding the role graduate assistantships can play in transforming the training and education of graduate students. Benefits and shortcomings of two assistantship programs were assessed and the findings were consistent with the five aims of an effective cooperative education program. However, there were a few shortcomings with this particular study which are discussed below with some future recommendations.

- (1) Small sample size: Future surveys should include more students in other programs. A larger sample size may lead to more definitive, statistically significant conclusions. Distribution to other programs may also be used to compare trends and define some best practices.
- (2) Master's versus PhD students: This detail may affect the way students' answered survey questions. Master's students typically enter into industry whereas PhD candidates generally plan to enter academia or research positions.
- (3) Career goals question: Future surveys should include a question regarding overall career goal of the student; academia vs. industry. The goals of students will influence the usefulness of different assistantship programs.
- (4) Standardized scales: Rephrase or reformulate survey questions with identical Likert-type scales. This change will allow for a proper inter-correlation analysis to be performed. The analysis will validate the question groupings and ultimately the survey.

5. Conclusion

This study's objective was to identify and assess potential benefits between two graduate assistantship programs: a traditional research/teaching based assistantship and an industry partnership assistantship. Both programs provided students with the same level of compensation. However, each program offered its own individual benefits to students. The industry partnership assistantship allowed students to have a greater exposure to the world of work outside academia

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and provided them hands on experience. The traditional research/teaching based assistantship aligned better with those skills that is beneficial to the graduate student conducting research with increased time on campus and contact with advisors. The ability for either program to be truly beneficial will be dependent on the student's career goals.

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