Developing Students' Competencies and Academic Performance through Academe- Industry Partnership

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Abstract *– This study determined the students' competencies and academic performance of engineering students through Academe- Industry Partnership of the Lyceum of the Philippines University in Batangas City. Descriptive type of research was utilized in the study. Engineering interns have very high competencies in terms of attitude with high performance in personality. There is a significant difference in the internship performance rating of engineering interns, wherein computer engineering interns obtained significantly higher ratings than Mechanical and Industrial Engineering interns. Mechanical Engineering students with high average rating in Industrial and Power Plant Engineering tend to obtain high competencies during internship.*

Keywords *– Competencies, Engineering, Mechanical, Industrial, Academic Performance*

I. INTRODUCTION

Higher Education Institutions (HEIs) are actively seeking effective approaches to improve the benefits gained from the internship programme (Andrew & Higson, 2008; Beck & Halim, 2008). Despite this trend, logistics firms are still facing difficulties on logistics graduates who are unable to apply knowledge gained into working environment setting (Keller & Ozment, 2009). Advantages of internships for students increased career opportunity, higher salaries, quicker job offers, faster promotion rates, job satisfaction, ease of transition from college to work, better communication skills, working, and applying the knowledge gained from the classroom (Gault, Leach, & Duey, 2010; Weible, 2010). Internships provide benefits for colleges and universities. The institution builds a tie-up with companies that may eventually employ their graduates by offering on- the- job training opportunities. The other advantage is that it maintains and makes revision or proposes modifications the curriculum current to satisfy the requirements of industry.

Industry has recognized the importance of the foregoing relationship with educational institutions so that a more adequate training responsive to their particular needs be addressed. Industry is interested in promoting linkages to academe not only to satisfy industry needs but also to help solve the unemployment problem. It is a general perception among industry managers that they always have room for excellent people. These are viewed as people who can help managers to lead their firms out of difficulties (Magnaye, 2010).

Competencies are identified knowledge, skills, abilities and personalities that impact the success of work performance of employees and business organizations. Competency models can help organizations align their initiatives to their overall business strategy so that companies can better recruit and select employees. A well sound Competency Model will also help with performance management, succession planning and career development. Like for instance, the terms competencies have been become a precise method for employers to observe and measure the performance of workers if it is superior, average or poor. These can be objectively enhanced, and improved through coaching and learning opportunities. Academic performance is the outcome of education — the extent to which a student, teacher or institution has achieved their educational goals. It is relevant because it is strongly connected to the positive outcomes for individual. It helps secure a bright future and brings higher chances of success in life. It also develops self esteem and creates good morals in a learner.

Wellman (2010) emphasized that employability skills should enable an individual to perform his job better. In their study, Keller and Ozment (2009) had identified seven skills which are perceived as important to logisticians which are teamwork, written communication, oral communication, prioritizing,

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seeing the "big" picture, problem solving and decision making. Insights from industry-partners are essential input to the development of program curriculum in order to determine the concerns of the employers regarding the required qualifications of the graduates (Laguador & Ramos, 2014). Others have emphasized the needs for students to acquire skills on analytical ability, computer applications, creative thinking, decision making, and task-related attributes (Bennett & Wright, 2010; Gault, Leach & Duey, 2010). Engineering as a degree program requires the students' inclination to mathematics to survive on carrying out various challenges of solving problems more analytically and critically (Laguador, 2013b).

The present study was an attempt to strengthen the internship program of the College of Engineering. As faculty member and at the same time the Department Chair of Industrial Engineering wherein one of the primary tasks is to supervise the attainment of knowledge, skills and values among the students especially during internship, the researcher conducted the study aimed at determining the required competencies that the students should possess when they get employed after graduation.

II. OBJECTIVES OF THE STUDY

This study determined the students' competencies and academic performance of engineering students through Academe- Industry Partnership of the Lyceum of the Philippines University in Batangas City.

More specifically, this study was guided by the following objectives: (1) to determine the demographic profile of the Engineering industry partners of LPU in terms of the following variables: location, major product/service, type of sector and length of years in operation; (2) to present the academic performance of engineering students in terms of the final grades in their respective professional courses: Computer Engineering (Engineering Management, Computer System Architecture, Computer Programming, Computer Hardware fundamentals and CISCO networking); Mechanical Engineering (Fluid Machinery, Industrial Plant Engineering, Power Plant Engineering, Thermodynamics and Machine Elements); Industrial Engineering (Industrial Materials and Processes, Ergonomics, Industrial Quality Control, Personnel Management and Facilities Planning and Design); (3) to determine the competencies of engineering students as evaluated by their immediate superior in terms of: Knowledge, Skills, Attitude, and Personality; (4) to test the significant difference in the competencies of engineering interns when they were grouped according to: profile of companies; and program of study; (5) to test the significant relationship between the academic performance and the competencies of engineering interns; and (6) to propose enhancement of the Academe- Industry Partnership of LPU- Batangas.

III. METHODS

Research Design

This research utilized the quantitative descriptive method of research. Quantitative methods emphasize on objective measurements and numerical analysis of data collected through polls, questionnaires or surveys. Quantitative research focuses on gathering numerical data and generalizing it across groups of people. The purpose of quantitative descriptive studies is to find interrelationships between variables.

Participants

The study included the final evaluation of 74 BS Computer Engineering, BS Industrial Engineering, and BS Mechanical Engineering students who were enrolled in their OJT from 2011 to 2013 at Lyceum of the Philippines University-Batangas.

A total of 30 students for BS Industrial Engineering, 20 students for BS Mechanical Engineering and 24 students for BS Computer Engineering were included as participants of the study. All 74 final evaluations were retrieved from the records of College of Engineering which encompassed 100 percent of the actual respondents.

Instrument

The instrument employed in the study was the OJT Evaluation form used by the Internship Office to assess the student trainees. The student office trainee final evaluation is being rated by the immediate superiors of the interns after their 600 – hour training. Meanwhile, the professional courses of the participants to be utilized in the study to determine the academic performance of the engineering students were identified from the tracer study of engineering students from 2009 to 2012 conducted by Dotong and Laguador (2013). The perceived Top 5 relevant courses to the job placement of the graduates were chosen to be included in the present study. The following professional courses for Electronics Engineering are: Electronics, Digital Communication, Logic Circuit & Switching Theory, Control Systems and Engineering Circuits; for Industrial engineering are: Industrial Materials and Processes; Ergonomics, Industrial Quality Control, Personnel Management and Facilities Planning and Design; for Mechanical Engineering are: Fluid Machinery, Industrial Plant Engineering, Power Plant

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Engineering, Thermodynamics and Machine Elements; for Computer Engineering are: Engineering Management, Computer System Architecture, Computer Programming, Computer Hardware fundamentals and CISCO networking.

Procedure

The data were collected using documentary analysis of the submitted and compiled Final Evaluation rated by the immediate superiors of the engineering student trainees. The academic performance ratings of the students were obtained from the compiled grade sheets and report cards of students from the College of Engineering.

Data Analysis

The following statistical tools were applied in interpreting the data obtained from the instrument used in the survey: Frequency count and percentage, weighted mean, Rank, Pearson – Product Moment Correlation Coefficient, Analysis of Variance and t-test.

The following arbitrary guides were used to analyze and interpret the result of the data gathered from the instruments used in terms of Competencies: 4.50 – 5.00: Excellent(E)/ Very High (VH); 3.50 – 4.49: Very Good (VG)/ High (H); 2.50 – 3.49: Good (G)/Average (A); 1.50 – 2.49: Fair (F)/Low (L); 1.00 – 1.49: Poor (P)/Very Low (VL) and in terms of Academic Performance: 1.00 – 1.49: Excellent (E); 1.50 – 1.99: Very Good (VG); 2.00 – 2.49: Good (G); 2.50 – 2.99: Fair (F); 3.00 and below: Poor (P).

IV. RESULTS AND DISCUSSION

Majority of engineering interns conducted their training from companies located in urban areas or those companies within the cities or town with 49 out of 74 with 66.22 percent against 25 or 33.78 in rural or from those companies located outside the cities or situated within the municipalities. Eighteen (18) or 24.32 percent of the Computer engineering interns underwent training in urban areas against 6 or 8.11 from rural areas; for mechanical engineering, 12 of them or 16.22 conducted their training in urban areas against 8 or 10.81 in rural while industrial engineering interns conducted their training in urban areas with 19 or 25.58 percent against 11 or 14.86 percent in rural.

Most of the engineering interns conducted their training in electronics or semiconductor companies with the total of 19 or 25.68 percent followed by fuel, oil and petrochemical with 12 or 16.22 percent wherein mechanical engineering interns are the majority of the trainees while 8 or 10.81 percent from automobile parts and automotive industry wherein majority of the trainees were coming from industrial engineering program and another 8 or 10.81 percent from Heavy Metal Fabricator and Construction from mechanical engineering.

The least group of companies were from electric and industrial power plant with 3 or 4.05 percent as well as plastic manufacturing with the same frequency while 2 or 2.70 percent from entertainment like Hotel, Casino's Services and Amenities as well as outsourcing industry with the same frequency.

Majority of the engineering students conducted their internship in companies that belong to private sectors with 62 out of 74 or 83.78 percent against 12 or 16.22 percent from public sectors.

These are companies where the BS Industrial Engineering students conducted their Internship: Babcock Hitachi Phil. Inc., Coca Cola Bottlers Phils. Inc., Denso- Phil. Auto Components Inc., Ionics, Ems Inc., Keppel Batangas Shipyard Inc., Manila Pavilion, Oriental Mindoro Electric Coop Inc., Pagoda International Inc., Pilipinas Shell Petroleum Corp., PSI Technologies Inc., Toyota Motor Philippine Corporation and Universal Robina Corp.

Meanwhile, the companies for Computer Engineering students are as follows: PSI Technologies Inc., JG Summit Petrochemical Corporation, Charleston Computer Express Center, Huawei Technologies Philippines Inc., Arkitel Globe- Batangas, AG&P, Amkor Technology, Phils., First Gas Power Corp., LPU-Batangas, PANASONIC, National Power Corp., and Globelines.

These are the companies where the Mechanical Engineering students conducted their internship: B/E Aerospace, Pilipinas Shell Petroleum Corp., Stepan Phil. Inc., Keppel Batangas Shipyard, Babcock Hitachi Phil. Inc., AG&P and United Coconut Chemicals Inc. Similar result was obtained in the study of Laguador (2013a) that majority of the companies of Computer, Industrial and Mechanical Engineering students belong to Private sector against the government agencies.

Majority of the companies where the students conducted their internship were already in the business for almost 31 – 40 years (24 or 32.43 %) followed by companies with 21 – 30 years (22 or 29.73%) in operation and 11 – 20 years (16 or 21.62%). The least group belongs to the companies with 1 – 10 years, 41 – 50 years and more than 50 years with 4 or 5.41 percent each.

Table 1 reveals the academic performance of Computer Engineering interns in terms of their final grades in selected professional courses.

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Computer engineering interns have very good average final grade of 1.9792 in computer hardware fundamentals followed by their good performance in Computer System Architecture with 2.2708 and CISCO networking with 2.4688 average final grades. However, they obtained fair average final grades of 2.5833 and 2.6458 in Computer Programming and Engineering Management, respectively.

Table 1. Academic Performance of Computer Engineering Interns in terms of their Final Grades in Selected Professional Subjects

Computer Engineering	Average Final Grade	VI	Rank
1. Engineering Management	2.6458	F	5
2. Computer System Architecture	2.2708	G	2
3. Computer Programming	2.5833	F	4
4. Computer Hardware fundamentals	1.9792	VG	1
5. CISCO networking	2.4688	G	3
Mean	**2.3896**	**G**	

The mean score of 2.3896 implies that the Computer Engineering interns have good average final grade in selected professional courses. The continuous development of computerization has far reaching effects on society and it is best that every learner be made conscious of the effects of computer on the different aspects of life (Laguador & Pureza, 2013).

Table 2 reveals the academic performance of Mechanical Engineering Students in terms of their final grades in selected professional courses.

Table 2. Academic Performance of Mechanical Engineering Interns in terms of their Final Grades in Selected Professional Courses

Mechanical Engineering	Final Grade Average	VI	Rank
1. Fluid Machinery;	2.8625	F	2
2. Industrial Plant Engineering	3.3125	P	4.5
3. Power Plant Engineering;	3.3125	P	4.5
4. Thermodynamics; and	2.9875	F	3
5. Machine Elements	2.8500	F	1
Mean	**3.0650**	**P**	

Mechanical engineering interns have fair average final grades of 2.85, 2.8625 and 2.9875 in Machine Elements, fluid machinery and thermodynamics, respectively. However, they obtained poor average final grade of 3.3125 in Industrial Plant Engineering and Power Plant Engineering.

The mean score of 3.0650 implies that the Mechanical Engineering interns have Poor average final grade in selected professional courses.

The result reveals that Mechanical Engineering is considered as one of the hardest engineering programs in LPU if the average grade of the BSME graduates will serve as the basis for its complexity (Laguador, 2013a). Majority of the final grades of BSME students were 3.00 which falls within the range of 75% - 77% in the grading system of LPU. Most of them also received NFE remarks from their professors and when they completed and submitted the final requirement of the subject, most probably; their final grades were already the lowest passing mark which is 3.00. Mechanical Engineering has a board examination from Philippine Regulation Commission (PRC). It is definitely appropriate for the students to learn all things properly that would be included in the board examination. Academic problems of college students come in various forms such as difficulty in math subject, lack of motivation and study habits, strict teachers and failed major examinations. Identifying these problems along with their negative attitude towards the engineering program would provide better understanding of students' situation and behaviour inside the classroom (Laguador, 2013e).

Table 3 reveals the academic performance of Industrial Engineering interns in terms of their final grades in selected professional courses.

Table 3. Academic Performance of Industrial Engineering Students in terms of their Final Grades in Selected Professional Courses

Industrial Engineering	Final Grade Average	VI	Rank
1. Industrial Materials and Processes;	2.5333	F	4
2. Ergonomics;	2.5750	F	5
3. Industrial Quality Control;	2.2000	G	1
4. Personnel Management	2.4583	G	3
5. Facilities Planning and Design	2.4417	G	2
Mean	**2.4417**	**G**	

Industrial engineering interns have good average final grades of 2.20, 2.4417 and 2.4583 in Industrial

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Quality Control, Facilities Planning and Design and Personnel Management, respectively. However, they obtained fair average final grades of 2.5333 and 2.5750 in Industrial Materials and Processes and Ergonomics, respectively. The mean score of 2.4417 implies that the Industrial Engineering interns have Good average final grade in selected professional courses.

Industrial Engineering is non-board program, and majority of the subjects are related to management. BSIE students were given case analysis and generally the problems solved by the students are situational. There were also various company operations being discussed and analyzed by the students and understanding the facilities planning and design of a certain work environment. If the nature of major subjects of BSME will be compared to BSIE, BSME subjects are more on industrial design while BSIE is more on understanding the company processes (Laguador, 2013a).

Table 4 presents the competencies of engineering interns as evaluated by their immediate superior in terms of knowledge.

Table 4. Competencies of Engineering Interns as Evaluated by Their Immediate Superior in Terms of Knowledge

Knowledge	CpE		ME		IE		Total		
	WM	**VI**	**WM**	**VI**	**WM**	**VI**	**WM**	**VI**	**Rank**
1. The intern comprehends/follows instructions easily	4.96	E	4.25	VG	4.20	VG	4.46	VG	1
2. The intern understands the operating procedures and techniques	4.83	E	4.10	VG	4.10	VG	4.34	VG	3
3. The intern is competitive enough in his/her job assignment	4.83	E	4.15	VG	4.03	VG	4.32	VG	4.5
4. The intern is able to organize work and analyze it	4.75	E	4.30	VG	4.13	VG	4.38	VG	2
5. The intern has the command of relevant general information and technology	4.58	E	4.05	VG	4.30	VG	4.32	VG	4.5
Composite Mean	**4.79**	**E**	**4.17**	**VG**	**4.15**	**VG**	**4.36**	**VG**	

Computer engineering interns obtained an excellent performance rating from their superior in terms of knowledge with 4.79 composite mean score while mechanical engineering and industrial engineering interns obtained a very good performance weighted mean rating of 4.17 and 4.15, respectively.

In general, they were rated very good in the way the interns comprehend and follow instructions easily as denoted by the total weighted mean score of 4.46 on rank number one followed by another very good performance rating in the manner that the interns were able to organize and analyze work with 4.38 total weighted mean score on rank number 2 while the interns understanding of the operating procedures and techniques obtained another very good performance rating with 4.34 total weighted mean score on rank number 3.

The interns are competitive enough in his/her job assignment and the interns have the command of relevant general information and technology obtained the least total weighted mean score of 4.32.

For a rational performance of technological process, it is necessary to possess not only the skill of detecting a defect, but also some knowledge of how to determine its type, establish the causes of its occurrence, and finally take measures which will prevent its recurrence. Thus defined problem requires exploration of different resources to find only this knowledge which will be helpful in solving of a particular problem. In terms of the knowledge engineering, which is one of the fields of modern information science, knowledge is a formalised notation of causal-resultant relations and of relations that are present in the data sets and information resources regarding certain problem areas (Kluska-Nawarecka et. al, 2007).

Table 5 presents the competencies of engineering interns as evaluated by their immediate superior in terms of skills.

Computer engineering interns obtained an excellent performance rating from their superior with 4.69 composite mean score in terms of skills while mechanical engineering and industrial engineering interns obtained a very good performance weighted mean rating of 4.08 and 4.17, respectively. The effectiveness and efficiency of an organization comes down to the effectiveness and efficiency of individual

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workers in the organization. The management of time is an issue which is fundamental to job performance, and how a worker manages his/her time will depend literarily on his/her favourable or unfavourable attitude towards time which will invariably influence his/her perceived job performance in an organization (Omolayo & Oluwafemi, 2012).

Table 5. Competencies of Engineering Interns as Evaluated by Their Immediate Superior in Terms of Skills

Skills	CpE		ME		IE		Total		
	WM	VI	WM	VI	WM	VI	WM	VI	Rank
1. The intern seeks to improve his/her skills by taking initiative to learn new paradigms and methodologies	4.58	E	3.95	VG	4.07	VG	4.20	VG	5
2. The intern is comfortable in presenting recommendations, suggestions and criticisms to his/her supervisor/peers and open to accommodate them with an objective and positive point of view	4.58	E	4.10	VG	4.00	VG	4.22	VG	4
3. The intern is accurate and efficient in work	4.75	E	4.15	VG	4.30	VG	4.41	VG	1.5
4. The intern makes productive use of the resources like terminals and or workstations assigned to him/her.	4.79	E	4.10	VG	4.17	VG	4.35	VG	3
5. The intern delivers the required amount/volume of work output within the allotted time.	4.75	E	4.10	VG	4.33	VG	4.41	VG	1.5
Composite Mean	**4.69**	**E**	**4.08**	**VG**	**4.17**	**VG**	**4.32**	**VG**	

The engineering interns worked with accuracy and efficiency and they delivered the required amount or volume of work output within the allotted time as denoted by their very good performance rating of 4.41 on rank number 1.5. They also obtained very good performance rating in making productive use of the resources like terminals and or workstations assigned to them and they are comfortable in presenting recommendation, suggestions and criticisms to their supervisor or peer and open to accommodate them with an objective and positive point of view as indicated by the total weighted mean scores of 4.35 and 4.22, respectively.

The interns sought to improve their skills by taking initiative to learn new paradigms and methodologies which obtained the least total weighted mean score of 4.20 with very good performance rating on rank number 5. Engineering students are required to have, by the time of graduation, a set of professional skills related to teamwork, oral and written communications, impact of engineering solutions, life-long learning, and knowledge of contemporary issues *(*Al-Bahi et al., 2013*).*

Table 6. Competencies of Engineering Interns as Evaluated by Their Immediate Superior in Terms of Attitude

Attitude	CpE		ME		IE		Total		
	WM	VI	WM	VI	WM	VI	WM	VI	Rank
1. The intern reports to the office with regular punctuality and finishes the duty as scheduled.	4.75	E	4.30	VG	4.37	VG	4.47	VG	3
2. The intern is reliable and imbues a sense of responsibility with his/her superior or peers.	4.79	E	4.20	VG	4.37	VG	4.46	VG	4
3. The intern enjoys comfortable working relationship with his/her superiors or peers.	4.92	E	4.30	VG	4.63	E	4.64	E	1
4. The intern applies the virtues of integrity and honesty in all aspects of his/her work	4.88	E	4.35	VG	4.57	E	4.61	E	2
5. The intern has the positive attitude towards criticisms and towards superiors.	4.79	E	4.10	VG	4.37	VG	4.43	VG	5
Composite Mean	**4.83**	E	**4.25**	VG	**4.46**	VG	**4.52**	E	

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Table 6 presents the competencies of engineering interns as evaluated by their immediate superior in terms of attitude. Computer engineering interns obtained an excellent performance rating from their superior in terms of attitude with 4.83 composite mean score while mechanical engineering and industrial engineering interns obtained a very good performance weighted mean ratings of 4.25 and 4.46, respectively.

Engineering inters obtained an excellent performance rating in the way that they enjoy comfortable working relationship with their superiors or peers and they apply the virtues of integrity and honesty in all aspects of their work as denoted by the total weighted mean scores of 4.64 and 4.61 on rank number 1 and 2, respectively.

They obtained very good performance rating through reporting to the office with regular punctuality and finishing the duty as scheduled and for being reliable and imbue a sense of responsibility with their superior or peers as manifested by the total weighted mean scores of 4.47 and 4.46 on rank numbers 3 and 4, respectively.

However, they obtained the least total weighted mean score of 4.43 on having positive attitude towards criticisms and towards superiors with very good verbal interpretation.

LPU Engineering students as observed by immediate superiors are courteous, honest, possess good moral character, with self-efficacy, good in oral communication, patient and positive thinkers. They accept assigned job or task without hesitation, they possess positive attitude towards work, they have sense of humor, cheerful, helpful, team player, and diligent with admirable work ethics (Laguador, 2013a).

Attitudes are developed as a result of some kind of learning experiences, or attitude can also be formed simply by adapting the example and opinion of co-employees, friends and managers. This is mimicry or imitation, which also has a vital to play in developing negative attitude at workplace (Suleiman, 2013). Learning to collaborate with the team and showing proper care and respect to each member would tighten the connection between cooperation and unity of thoughts (Laguador, 2013d). Communication, human and technical skills and the values of Love of God, honesty, love for truth and perseverance and hard work are very relevant to their job (Meñez, 2014).

Table 7 presents the competencies of engineering interns as evaluated by their immediate superior in terms of personality.

Table 7. Competencies of Engineering Interns as Evaluated by Their Immediate Superior in Terms of Personality

Personality	CpE		ME		IE		Total		
	WM	VI	WM	VI	WM	VI	WM	VI	Rank
1. The intern reports for work in attire and follows proper personal hygiene	4.75	E	4.37	VG	4.67	E	4.62	E	1
2. The intern exercise self-confidence and comfortable in airing his/her problems and difficulties with his superior	4.63	E	3.95	VG	4.40	VG	4.35	VG	5
3. The intern is flexible in work and in dealing with people	4.67	E	4.15	VG	4.33	VG	4.39	VG	4
4. The intern accepts miscellaneous jobs and tasks with the proper attitude without complaining	4.96	E	4.40	VG	4.30	VG	4.54	E	3
5. The intern shows interest and pride with the tasks assigned to him/her.	4.75	E	4.63	E	4.47	VG	4.60	E	2
Composite Mean	**4.75**	**E**	**4.28**	**VG**	**4.43**	**VG**	**4.49**	**VG**	

Interns from BS Computer Engineering program obtained an excellent performance rating of 4.83 from their superior in terms of personality while mechanical engineering and industrial engineering interns obtained a very good performance weighted mean ratings of 4.28 and 4.43, respectively.

Engineering interns obtained an excellent performance rating through reporting for work in attire and following proper personal hygiene as denoted by the total weighted mean score of 4.62 followed by showing their interest and pride with the tasks assigned to them and accepting miscellaneous jobs and tasks with the proper attitude without complaining as manifested by the total weighted mean scores of 4.60 and 4.54 on rank numbers 2 and 3, respectively.

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They obtained a very good performance rating with the least total weighted scores of 4.39 and 4.35 for being flexible in work and in dealing with people and through exercising self-confidence and being comfortable in airing their problems and difficulties with their superior.

Difference on the Competencies of Engineering Interns in terms of their Respective Companies

There is no significant difference in the competencies of engineering interns when they were grouped according to company profile in terms of location, major product/service, type of sector and years in operation as denoted by the computed p-values which are all greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted. This signifies that the industry partners of LPU-Batangas have comparable observation on the competencies of engineering interns.

The study of Omolayo and Oluwafemi (2012) also revealed that there is no difference in the attitude of workers towards time among private and public sector workers. It is therefore important for private and public organization to know how to allocate time to the workers in performing their assigned responsibilities, and how they perform on their job.

Difference on the Competencies of the Engineering Interns According to their Respective Programs

There is a significant difference in the competencies when the participants were grouped according to their respective programs as denoted by the p-values which are all greater than the 0.01 level of significance, therefore, the null hypothesis is rejected. In terms of knowledge, skills, attitude and personality, the competencies of the computer engineering students were significantly higher than performance of Mechanical and Industrial Engineering students during internship.

This confirmed the result of the study of Laguador (2013a) that the four groups of engineering students namely computer, mechanical, industrial and electronics engineering have significant differences in their OJT performances due to the different levels of their capacity to think, behave and apply what they have learned, achieved and experienced which affect their work performance.

Relationship Between Academic Performance and Competencies of Computer Engineering Students

Results showed that the selected professional courses of the Computer Engineering interns were not significantly related to their internship competencies as denoted by the p-values which are all greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted. This signifies that the final grades of the computer engineering students in the identified professional courses are not factors that determine the students' competencies during their internship and this is true to the subjects under study. This implies that those computer engineering students who performed well in class still have the possibility to obtain either high or low performance during internship.

In the study conducted by Omolayo and Oluwafemi (2012) which is related to the present study, they found out that there is no significantly joint and independent influence of workers' attitude towards time and work on perceived job performance in the public sector which indicates that public sector workers' attitude towards time and work does not have any influence on their perceived job performance, contrary to the private sector workers' attitude towards time and work that has a joint influence on perceived job performance with the worker's attitude towards time having the only independent influence in perceived job performance. Integrating Information and Communication Technology in the curricula would advance the learning of the students both in managing technology and study habits (Laguador, 2013c).

Relationship Between Academic Performance and Competencies of Mechanical Engineering Students

There is no significant relationship between the average final grades of Mechanical engineering interns in terms of Fluid Machinery, Thermodynamics and Machine Elements and their competencies during internship as denoted by the computed p-values which are greater than the 0.05 level of significance. Therefore, the null hypothesis for these variables is accepted.

Meanwhile, their final grades in Industrial Plant Engineering and Power Plant Engineering marked significant relationship with the competencies during internship as denoted by the p-values which are less than the 0.01 level of significance. Therefore, the null hypothesis for these variables is rejected. This signifies that those Mechanical Engineering students with high average rating in Industrial Plant Engineering and Power Plant Engineering have also the tendency of obtaining high competencies during internship while those Mechanical Engineering students with low average rating have the possibility of obtaining low competencies.

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It confirmed the study of Laguador (2013a) that Mechanical Engineering students who performed well in their assigned task during their OJTs also obtained notable ratings in general and professional education subjects.

Relationship Between Academic Performance and Competencies of Industrial Engineering Students

There is no significant relationship between the average final grades of Industrial engineering interns in terms of Industrial Materials and Processes, Ergonomics and Personnel Management and their competencies during internship as denoted by the computed p-values which are greater than the 0.05 level of significance. Therefore, the null hypothesis for these variables is accepted. This signifies that these professional courses were not factors that determine the internship performance of the Industrial Engineering interns.

Meanwhile, there is a significant relationship between the final grades of Industrial Engineering interns in Industrial Quality Control and their competencies in terms of attitude. Likewise, there is also significant relationship between Facilities Planning and Design and the competencies of the Industrial engineering interns in terms of personality. These imply that those students with high average final grade on these mentioned professional courses have the tendency of obtaining high performance rating during internship in terms of attitude and personality.

Attitude as a concept is all about individual way of thinking, acting and behaving. It has a very serious effect on work/employee performance. Positive attitude at work place is supposed to be the bedrock and foundation toward higher performance in established settings. It is an investment as well as resources that can be used to achieve a higher profit, good reputation and overall organizational goals (Suleiman, 2013).

V. CONCLUSIONS

Majority of engineering interns conducted their training in electronics or semiconductor, fuel, oil and petrochemical private companies located in urban areas with almost 31 – 40 years in business operation. Computer Engineering and Industrial Engineering interns have higher average final grade in the identified professional courses compared to Mechanical Engineering interns but the complexity and nature of board program like BSME could be a factor that influence the academic performance rating compared to non-board program like BSCpE and BSIE. Engineering interns have very high competencies in terms of attitude with high performance in personality. There is a significant difference in the internship performance rating of engineering interns, wherein computer engineering interns obtained significantly higher ratings than Mechanical and Industrial Engineering interns. Mechanical Engineering students with high average rating in Industrial and Power Plant Engineering tend to obtain high competencies during internship. The proposed enhancement plan for LPU-Batangas specifically for the College of Engineering has been formulated to strengthen the partnership with the industries.

VI. RECOMMENDATION

The Internship Office may consider the students' evaluation of the companies in selecting and sustaining memorandum of agreement among industry partners that could really provide extensive and related training and experience to the engineering interns. The Dean, together with the department chairs of respective engineering programs, may strengthen the curricular offerings and academic performance of the students through the implementation of Outcomes-Based education leading to the acquisition of appropriate knowledge, utilization of suitable information and application of proper skills and attitude in various fields and work environment. The Engineering students may be given proper work orientation through seminars and lectures to be provided by the College of Engineering in cooperation with the Internship office to prepare the students in a service –oriented business with an atmosphere of real corporate world. Trainings and other educational programs may be proposed and implemented by the College of Engineering and the rest of the recognized student organizations of the college to help the students acquire the appropriate skills they need before they leave the portals of the university. Having the right confidence towards writing would give a greater opportunity for the students to excel in many areas of their respective fields of undertakings (Laguador, 2013f).

College of Engineering may suggest possible companies through the assistance of Alumni who worked in manufacturing industries to become the LPU's partner in developing more the skills of the engineering students through internship program. The proposed enhancement may be implemented to strengthen the Academe-Industry Partnership of LPU-Batangas. For future researchers, several factors may be still be investigated to justify further the result of the present study using intervening variables like nature of work and educational background of the immediate

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superiors who assessed the performance of the engineering interns.

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