



# **Employability of the Graduates of Bachelor of Science in Mechanical Engineering from Academic Year 2011-2015: Basis for a Proposed Student Development Program**

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**Abstract**— The employment of mechanical engineers is projected to grow 5 percent from 2014 to 2024, about as fast because of the average for all occupations. Mechanical engineers can add many industries and on many varieties of projects. As a result, their rate will differ by the industries that employ them. Job prospects could also be best for people who stay informed regarding the foremost recent advances in technology. This paper determined the employability of engineering graduates for five academic years from 2010-2011, 2011-2012, 2012-2013, 2013-2014, and 2014-2015. It specifically determined this employment, employment status, nature of employment, competencies learned in college, and work-related values of the respondents; and proposed a student development program. The results showed that 100% of the Graduates of Bachelor of Science in engineering from 2011-2015 were gainfully employed locally with regular status and were holding relevant positions. The Engineering courses had contributed to the graduate's professional advancement.

**Keywords**— curriculum, employability, graduates, mechanical engineering.

## **I. INTRODUCTION**

The stability and growth of a country's economy turn on its ability to provide goods and services for both domestic and international use. Labour represents a vital factor of production, hence, the advance of the standard of the working class and efforts to create it more productive and alert to growth is critical for the event of the economy.

From the data of the National Statistics Office now under the Philippine Statistics Authority and therefore the graduates' data from the Commission on teaching, it had been reported that the utilization rate within the Philippines increased to 94.40 percent within the third quarter of 2017 from 94.30 percent within the second quarter of 2017. the utilization Rate within the Philippines averaged 91.12 percent from 1991 until 2017, reaching an all-time high of 95.30 percent within the fourth quarter of 2016 and a record low of 85.60 percent within the second quarter of 1991. This trend goes to indicate that more employment opportunities are being created and therefore the quality of the proletariat is improving.

Graduates' employability is one among|one amongst|one in every of} the final word goals of upper educational institutions (HEIs) effort of providing quality in all their actions. HEIs try and make sure

that their graduates would be a part of the larger community of execs who contribute to the event of their respective fields of specializations and organizations and who fulfill their duties and responsibilities with utmost diligence to moral standards and respect towards co-workers. With the proliferation of the industries evidenced by the increased use of automation, machinery, and services, the technology profession plays a very important role within the development of the country. With this, employment opportunities for the graduates of engineering (ME) are sufficiently within the Philippines as more jobs are continuously created with the influx of foreign investors like those located in Philippine Economic Zones in Laguna and Cavite. Philexport.ph reports that the Philippines remains to be the amount one supplier of knowledge-based jobs and workers worldwide with immediately available labor of 32 million and over 100,000 engineering's, IT, and technical graduates per annum. The employment of mechanical engineers is projected to grow 5 percent from 2014 to 2024, about as fast because of the average for all occupations. Mechanical engineers can add many industries and on many varieties of projects. As a result, their rate will differ by the industries that employ them. Job prospects could also be best for those that stay informed regarding the foremost recent advances in technology.

Furthermore, they're projected to experience much faster than growth in engineering services as companies still contract work from these firms. Mechanical engineers also will remain involved in various manufacturing industries, particularly transportation equipment. they're going to be needed to style the subsequent generations of vehicles and vehicle systems, like hybrid-electric cars and clean diesel automobiles. They often work on the most recent industrial pursuits. The fields of different energies, remanufacturing, and nanotechnology may offer new opportunities for occupational growth. Nanotechnology, which involves manipulating matter at the tiniest levels, may affect their employment because they're going to be needed to style production projects on the premise of that technology. Nanotechnology are going to be useful in areas like healthcare and designing more powerful computer chips.

However, the increasing number of graduates and also the conscientious and meticulous employers pose challenges to ME graduates additionally to other problems they'll encounter in searching for employment. Curriculum revision and enhancement are done several times to deal with the changes and meet the necessities of the program standards to adapt to the abrupt changes of the socio-economic environment that's led to by the upper standards of competition, privatization, and globalization. With the growing number of graduates of engineering, there's now a desire to judge how the LSPU is ready to retort to the requirements and demands of the work industry.

Graduate surveys constitute one sort of empirical study which will provide valuable information for evaluating the results of the education and training of a selected institution of upper education. This information is also used for further development of the institution within the context of quality assurance.



Tracer studies could then be used as a method of maintaining curriculum relevance and providing targeted benefits to graduates to boost the marketability of engineering programs. Adequate knowledge on employment outcomes of engineering graduates could assist in formulating policy towards combating some social problems like unemployment and underemployment.

Moreover, Millington states that tracer studies provide quantitative-structural data on employment and career, the character of labor and related competencies, and data on the professional orientation and experiences of their graduates. The employment of a graduate tracer study is advocated as an appropriate tool in determining institutional capability in preparing graduates to satisfy the stress of the workplace. The graduate tracer studies involve the determination of graduates within the job search mode, lead time, and employment condition, where the knowledge acquired in schools are wont to work, in promotions, and job satisfaction.

## **II. OBJECTIVES**

This study determined the employability of Mechanical Engineering graduates for five academic years from 2010-2011, 2011-2012, 2012-2013, 2013-2014, and 2014-2015. It specifically determined the present employment, employment status, nature of employment, competencies learned in college, and work-related values of the respondents; and proposed a student development program.

## **II. MATERIALS AND METHODS**

### ***Special Sampling Techniques and Methodology***

This employability study used the descriptive research design wherein in line with Shuttleworth, it's a methodology that involves observing and describing the behavior of a subject matter without influencing it in any way. The topic is being observed in an exceedingly completely natural and unchanged natural environment.

Descriptive research is commonly used as a pre-cursor to quantitative research designs, the overall overview giving some valuable pointers on what variables are worth testing quantitatively. Quantitative experiments are often expensive and time-consuming so it's often sagacity to urge a thought of what hypotheses are worth testing.

Total population of 103 applied science graduates from five Academic Years 2010-2011 (11 graduates), 2011-2012 (14 graduates), 2012-2013 (26 graduates), 2013-2014 (22 graduates), and 2014-2015 (30 graduates) was the participants of the study.

The survey questionnaire was the most instrument employed in this study. The instrument was crafted from the prescribed instrument for tracer study of the University wherein some variables were omitted only for the aim of determining some basic data and knowledge from the graduates which included: this employment, employment status, nature of employment, competencies learned in college and work-related values of the respondents. The questionnaire for the employers' feedback on the

task performance of the engineering science graduates has supported the leading brand of LSPU-Sta. Cruz wherein graduates should possess the 4C's (Collaboration, critical thinking, creativity, and communication) to exemplify the great image and uniqueness of being an LSPian (a term wont to identify the scholars of LSPU).

The respondents were informed of the aim of the study and were invited to participate within the survey with the peace of mind that the information provided within the survey was treated with the utmost confidentiality and was solely used for the aim of this research. The researchers administered the questionnaires through an online survey. The study tried to attain a 100% retrieval rating. Frequency count, percentage, and rank were wont to interpret the utilization status of the respondents with regard to the chosen variables.

Weighted Mean was accustomed to determining the degree of perception of the graduate-respondents within the school-related factors in terms of curriculum, competencies learned, and work values that contributed to their job placement.

The respondents got four options to spot the factors that contributed to the location of the engineering graduates in their present employment and to see the abilities developed by the Laguna State Polytechnic University and work-related values of the respondents. The given scale was used to interpret the result of the survey: 3.5 – 4.00: Very Relevant; 2.5 – 3.49: Relevant; 1.5 – 2.49: Little; 1.0 – 1.49: Very Little

### III. RESULTS AND DISCUSSION

**Table 1: Employability of Mechanical Engineering Graduates for Five Academic Years**

BSME Graduates	2011	2012	2013	2014	2015
Male	10	14	20	18	24
Female	1	0	6	4	6
Total Graduates	11	14	26	22	30
Percentage					
Employed	100%	100%	100%	100%	100%
Unemployed	0	0	0	0	0

Mechanical Engineering graduates from 2010-2015 were all employed in the field of Mechanical Engineering. This indicates that the graduates of mechanical engineering of LSPU 2010-2015 were highly employable.

**Table 2: Present Employment, Employment Status, Nature of Employment of Mechanical Engineering Graduates for Five Academic Years**

Place of Work	F	%
Local	96	93.20
Abroad	7	6.80
Present Employment Status		
a. Gainfully employed (regular or full time; job held is related to field of specialization)	101	98.06



b. Self-employed (working for oneself maybe from one's own profession or business; not working for another firm and drawing a salary)	2	1.94
c. Underemployed (part-time job; job is not related to field of specialization)	0	0
<b>Nature of Employment</b>		
Academe	1	0.97
Local Industry	85	82.52
Abroad	7	6.80
Proprietor	2	1.94
Power Plant	8	7.77

Table 2 shows the employment status and Nature of employment of Mechanical Engineering graduates. Out of 103 graduates, there are 101 who are employed and holding a regular job in their chosen field of expertise, 2 of them were in their own business, 82.52% of the graduate works in the local industry, 0.97% is in the academe, 6.8% is working abroad and 7.77% works in the power plant firm.

**Table 3: Competencies Learned in LSPU**

School Related	Weighted Mean	Verbal Interpretation	RANK
Curriculum and Instruction	4.5	VR	1
Professional Subject	4.2	VR	2
Research Subject	3.25	R	3
Community Extension	3.20	R	4
<b>Composite Mean</b>	<b>3.79</b>	<b>VR</b>	

Table 3 indicates the competencies of the graduates earned in the LSPU that are relevant to their chosen expertise. This shows that the curriculum and instruction are the most relevant factors followed by the professional subject, research, and community extension.

**Table 4. Relevance of the Curriculum to the Job Placement of Mechanical Engineering Graduates Curriculum**

Curriculum	WM	VI	Rank
Mathematics	3.15	R	7
Languages	3.55	VR	1
Natural Sciences	2.79	R	14
Machine Design	3.33	R	4
Refrigeration System	3.00	R	10
Air-conditioning and Ventilation	3.23	R	6
Fluid Machinery	3.41	R	3
Vibration Engineering	3.00	R	10
Industrial Plant Engineering	2.85	R	13
Power Plant Engineering	3.00	R	10
Machine Elements	3.50	VR	2
Electronics and Electricity	3.25	R	5
Thermodynamics	2.99	R	12

Engineering Management	3.08	R	8
Composite Mean	3.15	R	

After determining that curriculum and instruction are the most relevant school-related factors, the researchers determined what field in the curriculum of BSME is the most relevant in their work. Table 4 shows that language ranked as the highest and natural sciences landed last.

**Table 5: Work-Related Values of Mechanical Engineering Graduates**

Work-Related Values	Weighted Mean	Verbal Interpretation	Rank
1. Love for God	3.4	Relevant	1
2. Honesty and love for truth	3.28	Relevant	3
3. Punctuality	3.02	Relevant	16
4. Obedience to superior	3.06	Relevant	14
5. Perseverance and hard work	3.3	Relevant	2
6. Creativity and innovativeness	3.09	Relevant	11
7. Courage	3.03	Relevant	15
8. Professional Integrity	3.26	Relevant	4
9. Love for co-workers and others	3.08	Relevant	12
10. Unity	3.10	Relevant	10
11. Fairness and Justice	3.25	Relevant	5
12. Leadership	3.19	Relevant	7
13. Tolerance	3.17	Relevant	8
14. Efficiency	3.07	Relevant	13
15. Supportiveness	3.15	Relevant	9
16. Nationalism	3.20	Relevant	6
<b>Composite Mean</b>	3.16	Relevant	

Table 5 presents the work-related values of the mechanical engineering of LSPU that contributed in meeting the demands of the industry. The result shows that Love for God, perseverance and hard work, honesty and love for truth, professional integrity and fairness and justice ranked as 1 to 5 according to the graduates.

#### IV. CONCLUSION

Based on the data gathered Curriculum and Instruction, as well as Professional Subjects, are very relevant, whereas the Research subject and Community Extension were relevant to their respective work. The work-related values such as Love for God, Honesty, and love for truth, Punctuality, Obedience to superior, Perseverance and hard work, Creativity and innovativeness, Courage, Professional Integrity, Love for co-workers and others, Unity, Fairness, and Justice are integrated into the curriculum were all rated Relevant/relevant as well.

The results showed that 100% of the Graduates of Bachelor of Science in Mechanical Engineering from 2011-2015 were gainfully employed locally with regular status and were holding relevant positions. The Engineering courses had contributed to the graduate's professional advancement.

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