Mapping The Graduate Quality Of Automotive Engineering Education (S1) Study Program FT UNY

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Abstract. The particular study aimed to; 1) know the job’s field of graduate; 2) know the graduate’s waiting period to get a job; 3) know the quality of graduates; 4) know the relevance of educational material; 5) collect the advice and inputs from graduates for the development of Study Programs; and 6) mapping the positions for graduates. This study was a descriptive study. The population in this study was all alumni of Automotive Engineering Education Study Program and selected using Snow Ball Sampling. Data collection was through questionnaires and documentation. The data analysis technique used descriptive analysis. The findings showed; 1) Most types of alumni’s job are vocational school teachers in the automotive field (52%); 2) The most waiting period for graduates is between 1-2 months (57.6%); 3) The quality of graduates is in a very good category; 4) The majority of alumni stated that the material on study program curriculum is in the relevant category (52%); 5) Suggestions and inputs from alumni for the development of study programs, i.e. improving the English skills and soft skills for students, means of practice and cooperation; and 6) Most respondents stated that the level of the workforce’s needs for graduates is in the very high category (45%) and there are 28 types of jobs for graduates.

1. Introduction
The quality of higher education in Indonesia must always be improved to have a quality graduate and able to compete. Especially, with the ASEAN Economic Community (MEA) which has begun since 2015, make the competition among countries increasingly open. Higher education institutions in Indonesia consist of several types, namely Academy, Institute, Polytechnics, Colleges, and Universities (Law No. 20 of 2003, Article 20 paragraph 1). Today, the total of universities in Indonesia is 4578 (https://forlap.ristekdikti.go.id/). Therefore, with a very large number and different characters from each other, it is necessary to standardize and control the quality to maintain the output of the education process.

Each college must meet the national standards of higher education set by the government in its implementation. The national standard of higher education consists of 8 standards, which consist of 1) graduate competency standards; 2) learning content standards; 3) standard of learning process; 4) learning assessment standards; 5) standards of lecturers and education staff; 6) standards for learning facilities and infrastructure; 7) learning management standards; and 8) learning funding standards (Regulation of Ministry of Research and Higher Education No. 44 of 2015). To ensure the implementation of the regulation, every higher institution is required to have a Higher Education Quality Assurance System (SPM-PT). This system build to guarantee the quality of higher education, based on Article 53 and Article 52 paragraph (4) of the law of Dikti (Higher Education). SPM Dikti might conduct by implementing three types of activities, namely; 1) Higher Education Data Base (PDPT); 2) Internal Quality Assurance (PMI); and 3) External Quality Assurance (PME).

Universities must conduct three programs from the SPM-PT to maintain their existence in the midst of increasing competition among universities. If there are irregularities in the implementation of
education by higher education, the Ministry of Research and Technology might take actions such as giving reprimand or revoking licenses, such as the action of Ministry of Research and Technology to 243 colleges in 2017, of which, 103 are coaching and 140 are closed (http://regional.kompas.com).

Internal quality assurance (PMI) is an internally driven of self-evaluation by higher education, to meet or exceed the continuous SNPT / continuous improvement (in the past, it called Higher Education Quality Assurance). Through this activity, the higher education institution internally evaluates the implementation of the educational process and programs to determine its success and effectiveness. Based on these results, universities can make continuous improvements or make better planning to improve quality.

Based on Article 52 paragraph (2) Law No. 12 of 2012 on Higher Education, internal quality assurance consists of several steps that form a cycle, namely 1) Determination of higher education standards; 2) Implementation of higher education standards; 3) Evaluation of higher education standards; 4) Control the high education standards; and 5) Increasing the standard of higher education. Automotive Engineering Education Study Program has received A accreditation in 2015 and will be re-accredited in 2020. To maintain and improve the achievement, the Automotive Engineering Education Study Program must able to meet or exceed the standards or targets in both internal and external quality assurance systems.

The measurement of the success of the education process is not only limited to higher education, but the students can enter the workforce or at least, education institution knows correctly the quality and relevance of graduates' abilities in accordance with the needs of the workforce. Buttler (1972) stated the successful in its implementation of vocational education is when the quality and relevance of graduates' abilities are in accordance with the needs of the field.

In the evaluation phase, it not only carried out until the output stage such an Achievement Index (IP), student achievement and other internal components but also the impact of the education. The impact of education might see from the acceptance of graduates into the world of work, the suitability of graduates' competencies with the needs of graduate users, the linearity of types of work and the success of graduates in the workforce so that they can live in prosperity.

The impact of education might see through the tracing of alumni. So, the quality of graduates might find out or mapped for the development of study programs. There are several studies on tracing alumni, Shongwe, M & Ocholla, D. N. (2011), carried out tracer studies in 2000-2009 graduates of the Department of Library and Information Science from the University of Zululand. The statement were explored the implementation of this tracer study, such 1) the absorption of graduates; 2) curriculum suitability with the world of work; and 3) graduates' perceptions of the curriculum. Conrado I. Dotong, et. al. (2016) conducted a tracer study of engineering graduates from higher education institutions in the Philippines in the 2009-2012 Academic Year. The study explored several things including the absorption of graduates, types of work and behavior of alumni in the world of work, and the most useful competencies for graduates to enter the workforce.

Based on the explanation, it is very necessary to implement the SPMI series, namely the evaluation phase, especially data on graduates through tracer studies. So, the impact of education in Automotive Engineering Education Study Program and its relevance might use as a basis in revising curriculum and developing Automotive Engineering Education Study Program.

2. Method
2.1 Research Type
The research was qualitative descriptive with both data of qualitative and quantitative.
2.2 Place and Time of the Research
The research conducted at the faculty of automotive engineering education FT UNY on February 2018 to June 2018.

2.3 Population and Sample of the Research
The population in this study was all alumni of Automotive Engineering Education Study Program and selected using Snow Ball Sampling.

2.4 Data Collection Technique
Data collection was through questionnaires and documentation. The dissemination mechanism and questionnaire collection used email, telephone, social media and using Google Forms to reach the graduate who spread across the area of Indonesia.

2.5 Data Analysis Technique
The data analysis technique used descriptive analysis. By using descriptive analysis, it is expected to ease in data interpretation of the research result.

3. Result and Discussion
3.1 Type of Graduate Work
Automotive Engineering Education Study Program as one of the institutions has the graduates who have the ability/competence in the field of education, namely as instructors or educators in the industry. The profile of graduates of Automotive Engineering Education study programs are described as follows: 1) Vocational Teachers in Vocational High Schools of automotive engineering; 2) Training instructors at automotive vocational education institutions; 3) Training instructors in education and training centers in automotive industry; 4) designer training programs in the fields of education and automotive engineering.

However, the field of work occupied by alumni is not only limited to the education and automotive fields. Other fields of work might also become an option of the field of work and, surely, are still related to fields or material obtained from campus. The description of the distribution of occupational fields of graduates of Automotive Engineering Education might illustrate in table 1:

Table 1. The type of graduate work of Automotive Engineering Education Study Program

| No | Type of Work                          | Percentage (%) |
|----|--------------------------------------|----------------|
| 1  | Automotive Vocational High School Teacher | 52.0           |
| 2  | Employee/Staff/Official on Automotive Company | 23.5           |
| 3  | Automotive Lecturer                   | 7.8            |
| 4  | Entrepreneur on Automotive sector      | 6.9            |
| 5  | Instructor/Trainer of Automotive Industry | 4.9            |
| 6  | Head of School                        | 1.0            |
| 7  | Educators (Widyaiswara)               | 1.0            |
| 8  | Teacher or Educational Personnel       | 1.0            |
| 9  | TNI (Indonesian Army)                 | 1.0            |
| 10 | Entrepreneur Non-Automotive sector     | 1.0            |
|    | Total                                 | 100            |
Most of the income is at 7.5-10 million. Based on table 2, many graduates work in the automotive industry. The data of highest salary information is above 15 million. And, the lowest salary is under 1 million, but the percentage is very small.

3.2 Graduate’s Waiting Period to Get a Job
Indicators represent the quality of graduates and the need for graduates are the waiting period for getting a job. The waiting period for graduates to get the first job is 0-2 months (57.6%), 3-6 months (24.2%), 7-9 months (1%), 10-12 months (8.1%), 13-18 months (2%), 19-24 months (3%), and more than 24 months (4%). The majority of alumni have a short waiting period (0-2 months). Moreover, there are even students who before graduation have been accepted into the company or teach as vocational teachers.

3.3 A Quality of Graduate of Automotive Engineering Study Program
Based on the description of the data in table 6, the supervisor's assessment of the performance of graduates of the Automotive Engineering Education Program tends to be very good, which is indicated by the excellent category (61.2%), and moderate (34.7%). Ability is considered to be lacking is the mastery of English language ability with an unfavorable composition of 2%, less good of 17% and moderate at 62%. Thus, it needs efforts to improve foreign language skills.

| Table 2. A quality of graduate of Automotive Engineering Study Program (S1) |
|---------------------------------------------------------------|
| Integrity (ethics & morals) | Skills in the field of expertise (professional) | English Ability | Using information and Technology | Communication | Teamwork | Self-development | Common performance | Ability to teach practice | Ability to teach the theory | Mean |
| Very Good               | 84                           | 73            | 20          | 54          | 63        | 72        | 58        | 64        | 61        | 63        | 61.2        |
| Moderate                | 15                           | 25            | 62          | 44          | 34        | 25        | 40        | 34        | 34        | 34        | 34.7        |
| Unfavorable             | 0                            | 1             | 17          | 4           | 0         | 2         | 2         | 1         | 1         | 1         | 1.2         |
| Very Unfavorable        | 1                            | 1             | 2           | 2           | 1         | 1         | 1         | 1         | 1         | 1         | 1           |

3.4 Relevance of Curriculum at Automotive Engineering Study Program
Evaluation of the relevance of educational programs to the needs in the field, it needs to continue maintaining and developing the quality. Table 3 is the level of relevance of educational materials to the graduate field of work of Automotive Engineering Education Study Program.
Table 3. Relevance of material with graduate field of work at Automotive Engineering Study Program (S1)

| Basic Material | Educational Material | Material of the certain field | Laboratory Practice | Practice on workshop | PPL | Practice of Industry (PKL) | Final Task | Thesis | Mean |
|----------------|----------------------|------------------------------|---------------------|----------------------|-----|--------------------------|-----------|--------|------|
| Very Relevant  | 50                   | 47                           | 41                  | 36                   | 43  | 47                       | 45        | 31     | 34   | 41.6 |
| Relevant       | 47                   | 50                           | 56                  | 55                   | 50  | 48                       | 50        | 60     | 52   | 52.0 |
| Less of Relevant | 3                    | 3                            | 9                   | 7                    | 6   | 5                        | 7         | 10     | 4    | 5.9  |
| Not Relevant   | 0                    | 0                            | 0                   | 0                    | 0   | 0                        | 0         | 2      | 0    | 0.7  |

From the curriculum material in the Automotive Engineering Education Department, the majority of graduates stated that it was relevant (52%) and very relevant (41.6%) with the fields of work occupied by graduates. Some respondents stated irrelevant because there were a few percent alumni who work are not linear with their educational background. Thus, in general, concluded that curriculum materials in the Automotive Engineering Education Department have high relevance to the field of work of graduates.

The development of educational curricula needs to refer to the needs of the workforce. Based on the graduates of respondent and work in various relevant workplaces of the automotive sector; and then, the important competencies must provide to students. The competencies are described in table 4.

Table 4. The graduates competency of Automotive Engineering Study Program with the need of world of work

| General Knowledge | English | Computer | Research methodology | Teamwork | Oral Communication Ability | Written Communication Ability | Process of people empowerment | Theoretically knowledge | Specific Practice knowledge | Organization management | Leadership | Teaching ability |
|-------------------|---------|----------|----------------------|----------|-----------------------------|-----------------------------|-------------------------------|------------------------|---------------------------|------------------------|------------|------------------|
| Urgently Needed   | 63      | 70       | 83                   | 50       | 83                         | 88                         | 62                           | 52                     | 50                       | 55                     | 72         | 82               | 80       |
| Needed            | 34      | 29       | 17                   | 43       | 17                         | 12                         | 35                           | 43                     | 40                       | 35                     | 25         | 18               | 16       |
| Less of Needed    | 3       | 1        | 0                    | 7        | 0                          | 0                          | 3                            | 4                      | 9                        | 10                     | 3          | 0                | 2        |
| No Need           | 0       | 0        | 0                    | 0        | 0                          | 0                          | 1                            | 1                      | 0                        | 1                      | 0          | 2                |          |

Based on the results, almost all competencies in table 4 are needed because almost all respondents stated that these competencies were urgently needed or needed. The highest competency needed in the work world was oral communication skills where 88% of respondents chose oral communication.
3.5 Suggestions and Inputs from Graduates on Educational Development in the Automotive Engineering Education Department

The developments of study program can be conducted by considering the suggestions and input from graduates because graduates are the people who are closest to interacting and knowing the world of work and faced the real fact. By suggestions and inputs from graduates, progress and developments in the world of work can be identified earlier. So, they can adapt the education to the world of work. The suggestions and inputs are described, 1) Strengthening soft skills and entrepreneurship to students; 2) Add time for PPL and PI to strengthen the student’s ability; 3) Improvement and addition of practice facilities in accordance with technological developments; 4) Development the student competencies aiming they are not only focused in the field of automotive repair and maintenance but are also equipped with business management (marketing) in the automotive field; 5) Strengthening the competence of graduates in the field of graphic design; 6) Strengthening students' foreign language skills; 7) Strengthening and maintaining links with graduates to strengthen the quality of education in the Automotive Engineering Education Study Program.

3.6 Mapping the Positions for Graduates of Automotive Engineering Education Department

Based on the results on the needs of the world of work for graduates of automotive engineering education study programs, respondents stated that the needs were very high (35.5%), high (45.1%), low (16.7%), and very low (2.9%). The data showed that the level of the world of work for graduates in automotive engineering education study programs is very high. Therefore, the quality of graduates needs to be maintained in order the graduates are able to compete and meet the needs of the workforce.

The types of work occupied by graduates have great variation after the main purpose to meet the needs of vocational school teachers in the automotive field. Based on the results, the types of work occupied by graduates of the automotive engineering education department are presented in table 5.

| No | Type of Work            | Percentage |
|----|------------------------|------------|
| 1  | Teacher                | 61.8       |
| 2  | Instructor             | 50.0       |
| 3  | Workshop Head          | 28.4       |
| 4  | Service Advisor        | 25.5       |
| 5  | Manager Area           | 21.6       |
| 6  | General Manager        | 17.6       |
| 7  | Foreman                | 12.7       |
| 8  | Marketing              | 3.9        |
| 9  | Principals             | 2.9        |
| 10 | Supervisor             | 2.0        |
| 11 | Deputy of principal    | 2.0        |
| 12 | Analyst Technical      | 1.0        |
| 13 | Departemen head        | 1.0        |
| 14 | Design Quality Project | 1.0        |
| 15 | Field operation         | 1.0        |
| 16 | General Manager        | 1.0        |
| 17 | HRD                    | 1.0        |
| 18 | Head of Program        | 1.0        |
| 19 | Employees              | 1.0        |
| 20 | Head of Dputy          | 1.0        |
| 21 | Sales Manager          | 1.0        |
| 22 | School                 | 1.0        |
| 23 | Product Manager        | 1.0        |
| 24 | Sales Engineer         | 1.0        |
| 25 | Surveyor               | 1.0        |
| 26 | Technical Support      | 1.0        |
| 27 | Technician             | 1.0        |
| 28 | Trainer                | 1.0        |
4. Conclusion and Suggestion

4.1 Conclusion
Based on the findings and discussion, it draws conclusions; 1) the work types of the graduate of the Automotive Engineering Education Study Program has a great variation, but most are still relevant to the educational background. In the education sector, most types of work are vocational school teachers in the automotive field (52%); 2) The highest waiting period for graduates is between 0-2 months with a percentage of 57.6%; 3) Quality of graduates based on assessment of superior tends to be very good; 4) The majority of graduates stated that the curriculum material of study program is in the relevant category (52%); 5) Suggestions and input from graduate are provided for the development of study programs, such improvement of English skills and student’s soft skills, means of practice and cooperation; and 6) Most of the respondents stated that the need level of workforce for graduates is in the very high category (45%) and there are 28 types of jobs occupied by graduates.

4.2 Suggestion
Based on the conclusion, the research suggests: 1) Increasing the cooperation and empowerment (invite) the graduate for the development of study programs; 2) This research needs to have further research to obtain further information from graduate, as well as a quality control of education in the Automotive Engineering Education Department; 3) Although the quality and relevance of education are relatively good, but study programs need to perform continuous improvement, both facilities, and infrastructure and the development of the quality of lecturer.

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