

# **Development Of Employability Of Fresh Graduate Alumni Through Tracer Study By Evaluating The Likert Scale Method**

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## **ABSTRACT**

The number of electrical engineering graduates produced every year. The suitability of the required competencies with those of alumni is essential. In this research, a tracer study of electrical engineering graduates was conducted. Tracer study research is significant to find out the competency profile of graduates and alumni's workability about user needs. The target of tracer study is graduates of new graduates in 2019 and 2020. Research is significant to assess and improve the relationship between alumni characteristics and the field of work of graduates of study programs. The research used a descriptive approach design. The population is UNESA Electrical Engineering undergraduate graduates in 2019 and 2020 who have successfully filled out the online tracer study form. The number of samples as many as 139 respondents. The survey media uses university website links and google platform surveys distributed to each alumnus within six months. Data analysis used the descriptive analysis method Likert scale. Before the questionnaire was distributed to respondents, the validity of the questionnaire will be tested with Pearson correlation. The tracer study results in a Likert scale of 5 instrument questions by paying attention to the most significant percentage. The results of the tracer study instrument for knowledge obtained by alumni from lectures have a substantial contribution to the job market with a rate of 73%. Internships have a significant role in increasing world knowledge with a percentage of 63%, Practicum contributes a lot to the ability to work with a rate of 67%, English has a share of 41% of language skills obtained during college, and communication skills obtained from lectures with a percentage of 70% which received during studies, as well as the ability of alumni to solve problems in the job market which is the most significant percentage of 69%

**Keywords:** *Tracer Study, Likert Scale, Employability*

## **1. INTRODUCTION**

The world of education, including undergraduate education in electrical engineering, is always dynamic. Moreover, the changing times and the era of globalization require a university to produce graduates with competencies that meet their needs [1]. Therefore, consistent and continuous improvement in the quality of education to make qualified electrical engineering engineers by the educational competency standards of Indonesian electrical engineering graduates and able to compete globally is part of the vision and mission of the Faculty of Engineering and electrical engineering undergraduates UNESA / study programs listed in the Strategic Plan UNESA (Renstra UNESA) 2020-2024 [2].

One of the efforts to improve the quality of education is that educational institutions, in this case, the Faculty of Engineering, especially the electrical engineering undergraduate study program, are required to continue

to improve the curriculum and learning process. In addition, it is also supported by improving the quality and quantity of academic staff and supporting facilities.

Tracer Study is one of the research activities that collect information about the distribution of alumni and various inputs that can help develop the curriculum itself [1]. For engineering, undergraduate institutions, especially electrical engineering, alumni can provide information about the suitability of the competencies obtained during education with those needed at work. This information can be used as the basis for educational institutions in curriculum development and learning processes. UNESA's bachelor of electrical engineering was established in 2012, categorized as a new study program at UNESA.

This UNESA electrical engineering graduate alumnus is spread across various parts of Indonesia, from big cities to remote rural areas. These UNESA electrical

engineering graduates work in multiple types of employment, both directly related to the electrical engineering field and outside the electrical engineering field. In addition, Tracer Study activities can liaise between institutions and alumni regarding future graduate orientation. In the implementation of the Tracer Study at the UNESA electrical engineering graduate, this activity has been carried out before at the time of planning the performance of the Competency-Based Curriculum (KBK) and OBE (Outcome Based Education), which was just applied to the UNESA Electrical Engineering study program with the Problem Based Learning method. (PBL). To continue, in 2021, the Tracer Study will be carried out with the scope of graduates from the UNESA Electrical Engineering Bachelor [2].

## 1.1. LITERATURE

### 1.1.1. *Employability Skills*

In the job market, the term employability skill can be considered a personal characteristic related to working and interest in remaining active in the labor market. Employability skills [3] can be categorized into (1) fundamental skills needed to work for better ability development. These basic skills consist of communication skills, the ability to manage information, and operating numbers. (2) Personal management skills, namely personal skills, attitudes, and behaviors, spur a person's growth potential [4]. Personal management skills consist of showing positive attitudes and behavior, having a sense of responsibility, adapting, striving to learn continuously, working carefully, thinking, and solving problems. (3) Teamwork skills, namely skills and attributes needed to increase productivity. This skill consists of the ability to cooperate and be able to participate in tasks.

UNESA electrical engineering graduates are expected to work as technicians or entrepreneurship in technology and industry. This implies that graduates of the UNESA electrical engineering degree are expected to have the ability to operate technological tools according to their area of expertise. Thus, for UNESA electrical engineering graduates to remain attractive in the labor market, in addition to having fundamental skills, personal management skills, and teamwork skills, UNESA electrical engineering graduates must also have technological skills.

Competencies can be divided into three main groups— first, competencies obtained in schools can be directly used in the business industry after graduating. Second, competencies are acquired in schools that facilitate the acquisition of new competencies. Third, the competencies obtained in the context of their work.

Thus, the longer the working period and the length of training that a person has attended, the more frequent the learning process will be repeated. In this learning process,

there will be a connection between the employability skills of the (old) facilitator and the new employability skills, or repetition of the use of employability skills, so that it will increase the mastery of one's employability skills, which in turn will make a person more trusted to do work with a more complex level.

According to human capital theory [5], differences in human capital inherent in a person will result in variations in income. According to this approach, a person's productive abilities can be increased through self-investment. They can do this through education or training because education or training provides knowledge and skills that can be useful for their work and can be used productively in the labor market. If someone has increased or increased productivity by doing education or training and then working, then he will receive a bigger salary

Employability skills competence is expected to influence income (from the perspective of the labor market). According to human capital theory, competence is one indicator of productivity reflected in the amount of income. An increase in productivity means he does something faster, which means more mastering skills [6]. Because productivity affects salary, the skills mastered affect salary too

When someone is already working in the industry, learning activities occur while they are working or when they are attending training. Thus, the longer the working period, the more frequent and repeated learning activities will occur. In this learning activity, there is a connection between the facilitator's employability skills component (old employability skills), which includes technical skills, fundamental skills, personal management skills, and teamwork skills with the new employability skills component. or there will be a repetition of the use of employability skills components

Training also includes learning activities that are more planned than learning that occurs while working. During the training implementation, there was also a connection between the facilitator's employability skills (old employability skills) which included technical skills, fundamental skills, and personal management skills. And teamwork skills with new employability skills components, or there will be repeated use of employability skills components.

In addition, while working or participating in training, a person will acquire new employability skills unrelated to previous employability skills (while in education at the UNESA electrical engineering undergraduate study program). Thus, for someone who has a more extended working period, there will be a process of increasing mastery of the employability skills component (technological skills, fundamental skills, personal management skills, and teamwork skills). Likewise, with the length of training, the more often a person receives training, the more employability skills will be obtained,

including technical skills, fundamental skills, personal management skills, and teamwork skills.

The description above shows that during work or training, there will be a change in the level of mastery of employability skills, both technical skills (technological skills), the ability to use numbers and communication skills (fundamental skills), the ability to self-regulate in dealing with work (personal management skills). As well as the ability to work together (teamwork skills). Thus, it can be concluded that the longer the working period and the length of training a person will be, the shorter the mastery of technological shifts, fundamental skills, personal management skills, teamwork skills will be.

The payment system for workers' wages in Indonesia is primarily determined by years of service. This can be seen from the pattern of severance pay which is solely determined by years of service. Thus, someone who works long hours will get a higher wage/salary payment. In addition, a person who has worked in the company for a long time means that the person is trusted to do the work they are mastered. Therefore, one form of company trust in someone provides more income than people who have worked fewer hours with the same job.

Productivity is one measure of the success of an individual or company. People who have high employability skills will work faster and more effectively than other people. The person means having higher productivity the better. Because the productivity is taller, the person will get better rewards. The expected form of appreciation for the work is giving a higher salary than people who master and use employability skills under them.

In addition, people who have higher employability skills will be faster in doing a job and get better results than those who have employability skills below them. Because the results of his work are more and better (more productive), then the person will get a better reward (income).

The explanation above shows that the longer a person's working period, the higher the level of mastery of employability skills, the higher the level of employability skills used, and the more often employability skills are used, the higher the income received by a person.

### **1.1.2. Tracer Study**

Tracer Study or alumni survey at several universities in Europe and North America developed since the late 1970s. However, in Indonesia, Tracer Study only started around the early 2000s. It implemented national accreditation requirements for study programs by the National Accreditation Board for Higher Education (BAN-PT) formed by the Directorate General of Higher Education, Ministry of Education and Culture. The critical focus of this Tracer Study is to measure the quality of

learning outcomes (learning outcomes) or graduate competencies by recording job satisfaction and the relationship between the fields of knowledge studied and the type of work obtained or occupied. In addition, in some areas of the world, the Tracer Study is also intended to measure alumni competencies related to critical thinking skills, problem-solving skills related to their knowledge, communication skills, both oral and written, leadership skills, social sensitivity, etc.

The Tracer Study is based on the idea that the quality of educational institutions and the effectiveness of learning can be seen from the achievements of alumni several years after they leave college [7]. In addition, satisfaction with work, income, job or career achievements, concern for social problems, political problems, and the ability to accept others can be added. Thus, there are three fundamental questions related to the measurement of alumni competence.

1. How satisfied are the alumni with the education they received from their home university?
2. How satisfied are the alumni with their work?
3. How far is the contribution of alumni to the progress of the alma mater, society, and country?

The primary purpose of holding a Tracer Study is to collect information from alumni about the strengths and weaknesses of the study program related to learning objectives to prepare alumni for professional careers or further studies. In addition, another goal is to get input from alumni about things that need to be developed in learning to improve the teaching process in the future. This can be done by carefully observing the professional status of alumni. In addition, Tracer Study is also needed to (a) get feedback from alumni and graduate users regarding the learning process; (b) measure the satisfaction of alumni and graduate users about an educational program (study program). Finally, the congruence between the curriculum and the labor market demands will be seen in the alumni activities in work [8].

The objectives of carrying out the Tracer Study [5], among others, are as follows.

1. Identify graduate competencies (covering knowledge, skills, and attitudes).
2. It knows the relevance of the curriculum of the study program to the demands of the job market.
3. It knows the suitability between the competence of graduates and the type of work (profession) alumni.
4. They know the desires of the job market (job market signals) and their relevance to the competencies designed by the study program.

5. Meet accreditation or certification requirements (for example, BAN-PT, IABEE, ASIIN, and international accreditation) [9]
6. Fulfilling the requirements for a grant based on a study program or institution

### 1.1.1.1. Likert Scale [10]

The scoring for the survey data that has been collected is processed using the Likert scale method, which is a scale that contains several levels of answer choices regarding the respondent's opinion on a statement put forward. Changes in the Likert scale are used by eliminating some shortcomings of the multilevel Likert scale, such as the 5-level Likert scale, changing the Likert scale by eliminating the middle answer category, which aims to: (1) provide a neutral statement. (2) the middle answer gives the respondent's choice if the positive and negative choices are considered less appropriate. (3) the objectives of the very many (VM), many (M), few (F), and very few (VF) categories give respondents a choice in a positive or negative direction.

This study uses five alternative options to adjust the tracer study instrument with five criteria: very much, a lot, enough, a little, and very little. The Likert scale used a person's perception in an online survey. Respondents expressed opinions by choosing one of the alternative answers provided on the survey instrument based on the respondent's level of expression at the five levels of answer choices given. [11].

Survey data collection is used to obtain opinion data from respondents. According to the specified instrument, the survey questionnaire selects the type of optional questionnaire that asks respondents to choose an answer. A score is given for the alternative solutions in this questionnaire for each choice using a Likert scale. Thus, in this study, respondents answered questions in only five categories, including very many (VM), many (M), enough (E), few (F), very few (VF). The answers above have a weighted score. with details in table II [10]

**Table 1.** Score Categories

Answers	Score
Very Much	5
Much	4
Enough	3
Few	2
Very Few	1

### 1.1.1.2. Correlation Pearson [12]

Before the instrument survey is distributed, it is necessary to carry out a validity test that aims to clarify the meaning contained in the instrument survey. The survey is done in such a way that respondents have no

difficulty in answering the instrument survey. The survey instrument was distributed through online media to alumni.

The reliability data obtained from the instrument survey shows the consistency of the data measurement if it is used to measure the phenomenon of answering the same instrument survey at different times. The questionnaire instrument was tested using a Likert scale (1 to 5). The validity of the Likert scale method questionnaire using the Pearson correlation test described in equation 1 [12]

$$r_{XY} = \frac{n\sum XY - \sum X \sum Y}{\sqrt{n\sum X^2 - (\sum X)^2} \sqrt{n\sum Y^2 - (\sum Y)^2}} \quad (1)$$

Description:

$r_{XY}$  : correlation coefficient validity

n: number of respondents

X: comparison value

Y: the value of the instrument whose validity is sought

## 2. METHOD

Tracer Study is an evaluative study using descriptive and qualitative quantitative approaches. The 2021 Tracer Study will be carried out throughout March – September 2021. The research population in 2021 is all alumni of UNESA electrical engineering graduates who graduated in 2019 and 2020, while the sample was taken using a purposive random sampling method. The Tracer Study 2021 team collects data from alumni of the UNESA electrical engineering undergraduate. Several data collection activities have been planned, such as going directly to the field in various areas and using a correspondence system. However, going directly to the field and the correspondence system cannot be implemented due to time, cost, and human resources constraints. According to technological advances, other ways to utilize the internet [13][14], namely through the distribution of social media, which people are increasingly using in communicating and using email, an electronic mail currently widely used by people. The distribution carried out in the tracer study uses a broadcast system through WhatsApp groups and email broadcasts. The results obtained from the distribution through social media and email are very satisfying because many alumni fill out the tracer study website [15].

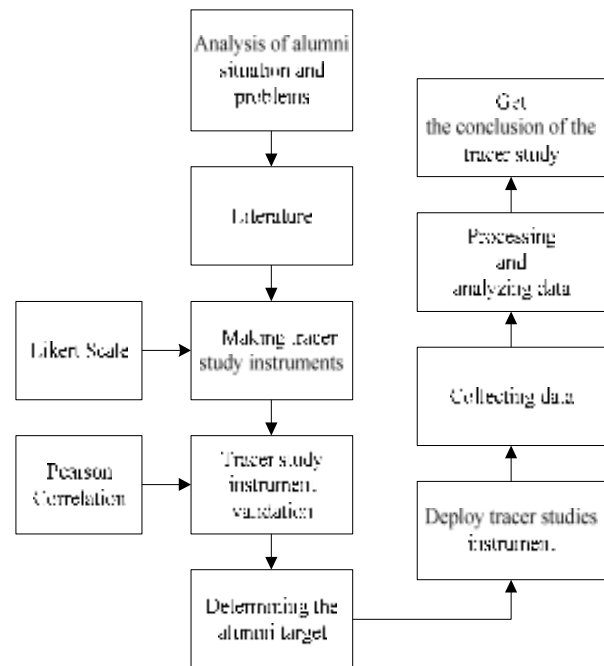
The difficulty experienced by the Tracer Study team in 2021 was that of the 139 respondents who were targeted to fill out the questionnaire through the website tracer study.unesa.ac.id, only 130 were successful. In addition, some have not filled in because the alumni contact cannot be contacted via email or mobile phones and alumni WhatsApp accounts. Therefore, this Tracer Study research is in the form of an evaluative study using a

structured questionnaire as a research instrument and added with open-ended questions to obtain as much information as possible.

In this study, steps were taken to obtain the survey results needed for tracer study analysis. Our action research is described in Figure 1. Some of the research steps depicted in Figure 1 are making tracer study instruments. Before making the tracer study instrument, we analyzed alumni's situation and problems in the job market. This initial analysis was obtained from various information from alumni through alumni meeting communication in the online meeting application. This alumni meeting is regularly held at least once a year by inviting alumni from UNESA. From several analyses and problems obtained, we focus on six main issues: the relationship of knowledge acquired on campus with the world of work, internship programs, practicum, English, problem-solving skills, and communication skills in the world of work. After we determine the problems faced by alumni, we use several supporting references so that the study instruments that are made are better.

Regarding the establishment of the tracer study instrument and the conduct of the tracer study, we designed some basic questions used as research data. These questions are instrumented into the research grid used in the survey. The questions we use are analogous to the descriptions of several tools that have been described in the study and can provide an overview of the state of the survey factors. The statement item is positive support. This positive supporting statement is used to motivate respondents to fill out the survey/questionnaire that has been distributed. We made the study instrument using the Likert scale method. The questionnaire that we made used online questionnaire media. The questionnaire was filled in by spreading the tracer study website to registered alumni. Then the alumni fill in the tracer study to completion with instruments that can support alumni in their work.

The next stage is to test the validation of the questionnaire data that alumni have filled out by using Pearson correlation so that the instruments distributed meet the survey rules. After making the tracer study instrument, we determined alumni as the target for the spread of the tracer study. The alumni target is new graduates in 2019 and 2020. The tracer study instrument created in the web-based online questionnaire is distributed through social media and online chat applications. It is hoped that the distribution of the tracer study alumni will fill in with the complete tracer study instruments provided. The data obtained from the online media will be collected using a data processing application. After the tracer study data is collected, the data processing and analysis stage will be carried out.



**Figure 1.** Research Method

The percentage obtained for each positive supporting question given from the alumni is recorded. From the data analysis, we can review the distribution of the number of positive support points related to the supportability possessed by alumni in the job market from the criteria we determined for this tracer study. From the results of the analysis we carried out, conclusions and recommendations can be drawn for universities and students who are currently undergoing education constantly to improve their resources, and universities can use analysis of tracer study data as a reference for evaluating the implementation of teaching in higher education, primarily undergraduate study programs. UNESA.

Electrical Engineering and improving the performance of tracking studies next year and supporting the accreditation of study programs.

For the last stage, we distribute what has been analyzed previously so that it can be used as a reference for evaluating the implementation of education in universities, especially the UNESA Electrical Engineering undergraduate study program, as well as improving the performance of tracking studies next year and as a support for study program accreditation.

In the questionnaire used for data collection, we used six questions containing the alumni's ability to job market

Q-1. Knowledge gained during lectures with work relationships

Q-2. The contribution of the internship program to work experience

Q-3. The contribution of the practicum of the lecture period to the work

Q-4. Ability in English to the world of international work  
Q-5. Ability to solve problems in the job market

Q-6. Ability to communicate in conveying ideas, reports, networking, and negotiating job market

In questions 1 (Q-1) to question 6 (Q-6), we want to know the distribution of alumni abilities in the job market through the Likert scale method with a question instrument that has been validated using Person correlation with a specified significance level ( $\alpha$ ) of 0.05 and the number of respondents as many as 139 alumni.

### 3. RESULT AND DISCUSSION

In analyzing the data to collect questionnaire data about the ability of alumni, especially fresh graduates in the job market, in this study, we obtained data in tabular form with descriptions.

**Table 2.** Question Questionnaire Q1

Criteria	Percentage
Very Much	40%
Much	33%
Enough	10%
Few	13%
Very Few	4%

In table 2, the Q-1 questionnaire with the highest percentage value of “much” total with a percentage of 73% states that science in lectures has a considerable contribution to the world of alumni work. Researchers need to propose to education providers to improve education delivery even better.

**Table 3.** Question Questionnaire Q-2

Criteria	Percentage
Very Much	31%
Much	32%
Enough	17%
Few	15%
Very Few	5%

In table 3, the question questionnaire Q-2 has the highest percentage value of “much” total with a percentage of 63% stating that the internship program held by the study program has a lot of contribution to the work experience of alumni.

**Table 4.** Question Questionnaire Q-3

Criteria	Percentage
Very Much	36%
Much	31%
Enough	18%
Few	10%
Very Few	5%

In table 4, the Q-3 questionnaire with the highest percentage value with a percentage of 67% states that practicum has a significant role in increasing the part of practicum in expanding the ability of alumni to face the job market.

**Table 5.** Question Questionnaire Q-4

Criteria	Percentage
Very Much	20%
Much	21%
Enough	30%
Few	20%
Very Few	9%

In table 5, the Q-4 questionnaire has the highest percentage value of “much” total with a percentage of 41% stating the English language skills possessed by alumni in facing the global market, which requires alumni to communicate using an international language (English).

**Table 6.** Question Questionnaire Q-5

Criteria	Percentage
Very Much	30%
Much	39%
Enough	15%
Few	10%
Very Few	6%

In table 6, the questionnaire questions Q-5 with the highest percentage value of “much” total with a percentage of 69% stating the ability to solve existing problems related to the job market and some issues that affect the quality of work of alumni.

**Table 7.** Question Questionnaire Q-6

Criteria	Percentage
Very Much	45%
Much	25%
Enough	15%
Few	10%
Very Few	5%

In table 7, the Q-6 questionnaire with the highest percentage value of “much” total with 70% states that communication skills are very influential in the job market because communication skills can expand work networks, negotiate the job market, and others.

**Table 8.** Validity Test Questionnaire

Question	r-Count	r-Table	Decision
Q-1	0.614916	0.195	Valid
Q-2	0.616862	0.195	Valid
Q-3	0.616764	0.195	Valid
Q-4	0.624593	0.195	Valid
Q-5	0.62694	0.195	Valid
Q-6	0.627607	0.195	Valid

In table VIII, we analyze the questionnaires that have been carried out/distributed to validate the questions used by the questionnaire and are used to avoid statements that are not clear in meaning, eliminate words that are difficult to answer, and consider adding subtracting items. Testing of the instrument was carried out on alumni outside of the recorded data.

#### 4. CONCLUSION AND SUGGESTION

From the analysis and discussion that has been carried out previously, we can conclude that in general terms on the questionnaire data that we have conducted, most of the alumni have considerable abilities in facing the challenges of the job market with the provision of knowledge during lectures, work experience gained from the internship program, work skills obtained from practicum from classes, English language skills in dealing with global markets, ability to solve work-related problems, and communication skills to expand network and work of quality. Therefore, with this tracer study, universities can use it to improve educational services, both formal and non-formal, mainly covering knowledge related to the world of work, internship programs, practicum, English language skills, ability to solve problems in the world of work, and communication skills in conveying information, an idea, report, network, and negotiation. On the other hand, tracer studies can be used by students who are currently studying at the university to maximize their learning experience, skills, and work both on and off-campus to become powerful human beings facing the world of work.

Future research is expected to use other instruments besides the instruments in this study, which are more weighty through online tracer studies.

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