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# Cooperation Between The Public and Private Sectors in Providing Internships for Students of Education Electrical Engineering

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**Abstract**— Industrial Practices (PI) or internships are not only important for students in order to achieve their level of competence, but also important for apprentice partner companies in order to obtain potential employment candidates. Asked questions: 1) How was the implementation of the S1 Electrical Engineering Education industry practice, the Faculty of Engineering UNESA? 2) How is partnership management planning with the business and industry world? To reveal the implementation of an internship at the UNESA Electrical Engineering Education Study Program was carried out through research with an expose facto approach. The research was carried out in the Department of Electrical Engineering and in the Industry where the internship students. The results of the study are 1) The implementation of internship or industrial practice of Electrical Engineering Education S1 students, the Faculty of Engineering UNESA is in accordance with the industrial practice manual issued by the UNESA Faculty of Engineering, but the implementation of PI monitoring and evaluation needs to be improved. 2) Planning the management of partnerships with the business and industry world for students of Electrical Engineering Education students has been well established and has spread to private industry, government and state-owned enterprises (BUMN).

**Keywords**—*internship, public and private sector cooperation, partnership, business world and industry.*

## I. INTRODUCTION

Law of the Republic of Indonesia [7] concerning Higher Education, Article 5 (a) explains that the aim of higher education is to develop the potential of students to become people who have faith and fear God Almighty, noble, healthy, knowledgeable, capable, creative, independent, skilled, competent, and cultured for the benefit of the nation. College graduates are expected to be able to apply, develop, create science and technology and/or art.

By referring to the aim of higher education as described above, the Basic Framework of Study Program Curriculum [4] consists of: (1) Basic Framework of S-1 Education Curriculum there are courses on Innovative Learning I with a load of 3 credits managed by Faculty / Study Program, 1 credit internship in field (Internship 1) and Innovative Learning II with a load of 3 credits managed by faculty/Study Program, 1 credit internship in the field (Internship 2); (2) Basic Curriculum Framework for Non-Education Undergraduate Study Programs are Field Work Practice (PKL) courses with a load of 3 credits managed by the Faculty/Study Program, internships in institutions/business/relevant industries; and (3) The basic framework of the D-3 Study Program curriculum contains courses on Field Work Practices (PKL) with a load of 4 credits managed by the Faculty/study program, internships in institutions/business/relevant industries.

In line with Chanapai's research [1] that the public and private sectors consider partnerships important. Job performance of people with undergraduate education is at low and medium levels. The right model of cooperation between public and private policies and management as PPP must be utilized to form new models of institutions. The results of Vertakova's research [9] say that one of the promising development directions is the application of broader public-private partnership practices in additional professional education organizations in state-owned schools that consider business interests. This work must be done extensively at the regional and sectoral level. This makes it possible to consider the specific features of certain PPP projects and to ensure their effectiveness and feasibility. While the results of the Negrut et al. [5] in Romania, where students and companies consider that apprenticeship is very important for human resource training. In general, internships provide benefits to both parties, namely: (1)

students have the opportunity to apply theoretical knowledge in order to obtain practical skills; (2) students have the opportunity in the recruitment process; (3) companies have the opportunity to assess, monitor and train potential employees; and (4) students can help companies in case of staff shortages (caused by holidays), or staff overload for a certain period.

Based on the results of the research described above, that apprenticeship in a company is an important program in the higher education environment. Internships are not only important for students in order to achieve their level of competence, but also important for apprentice partner companies in order to obtain potential employment candidates. Considering the importance of an internship program in higher education, it is necessary to ask questions: 1) How to describe the implementation of an apprenticeship for Electrical Engineering S1 students, Faculty of Engineering UNESA? 2) How to describe partnership management planning with the business and industry world?

## II. LITERATURE REVIEW

### A. *Public Private Partnership*

According to Noor [6] Public Private Partnership (PPP) is a form of agreement between the public sector (Government) and the private sector (Private) to hold public service facilities bound by agreements, divided into several forms depending on contracts and risk sharing. In Indonesia PPP is known as Government Cooperation with Business Entity (PPP), PPP is defined as cooperation between the Government and Business Entity in the Provision of Infrastructure aimed at the public interest by referring to the specifications previously set by the Minister/Head of Institution/Regional Head/BUMN/BUMD, which partly or wholly uses the resources of the Business Entity by paying attention to the sharing of risks among the parties. Government and private partnerships have actually been known since the New Order era, such as on toll roads and electricity, but began to be developed in 1998 after the monetary crisis.

Meanwhile, according to Waluyo [11] that educational institutions have a big role for the development of science and innovation, as well as providing solutions for society, business, and government. The academic world requires synergy with business entities and governments to participate in running development programs. The synergy model of three parties which includes education providers, businesses and government to improve economic dynamics and sustainability is often referred to as triple helix. These three elements have a strategic role to develop policies that are the result of interaction between elements of society, not policies that are born solely from the government. Triple helix can create private roles and community participation in the transformation of education.

One of the government's efforts to expand access and quality of education is to collaborate with the private sector,

which is often referred to as a Public Private Partnership (PPP) program. Partnerships between the government and the private sector are expected to improve the quality of education and know the skills needed by the business world [3]. This program opens opportunities for the private sector to participate in expanding access to education and at the same time becoming a bridge to reduce the gap between educational institutions and the business world.

### B. *Internship*

ChanLin [2] said that student internship opportunities provide valuable authentic learning experiences to engage students in solving work problems. The work assignment of the internship also challenges students to obtain the required knowledge about the specific context. Throughout the internship period, students work with workers in order to develop skills to complete certain tasks. Thus, the internship opportunity encourages an authentic learning experience by giving students the opportunity to integrate knowledge with practical experience in the field.

Trejo [8] said that The Polytechnic University of Santa Rosa Jauregui (UPSRJ) is a Mexican public institution where the Industrial Metrology Engineering undergraduate program (IMEUP) was recently started. The curriculum program develops the skills needed to enjoy a successful career in metrology. To achieve this goal, the program includes two part-time internships as a fundamental part of student academic training. Before students graduate, they must complete a full 600-hour off-campus internship that employs metrologists. This industry experience is carried out in real life professional metrology environments such as research centers, testing or calibration laboratories. One important aspect is that many students get jobs as a result of their internship. Note UPSRJ shows that 80% of university students get jobs as a result of their internships in this industry. This allows better integration of graduates into society.

In the Guidebook for Industrial Practices, Faculty of Engineering UNESA [10], Industrial Practices are taken within a period of 1 (one) to 6 (six) months. In general, the implementation of industrial practices is carried out at the end of semester holidays and students have taken prerequisite courses that have been determined in the curriculum of each study program. The scope of the material for Industrial Practice is in the fields of work or business fields chosen by students in accordance with the study program. The schedule and time allocation used for Industrial Practices depend on the opportunities available in the industry and the readiness of students participating in industrial practice programs.

### C. *Bachelor Degree in Electrical Engineering Education*

The Department of Electrical Engineering, Faculty of Engineering UNESA has 3 (three) study programs (study programs), that are the Electrical Engineering Study Program (PTE), the Electrical Engineering S1 (TE) study program and the Electrical Engineering D3 (TL) study program. After completing his education, a graduate of Electrical Engineering Education is expected to be able to:

(1) act as a vocational teacher in the Field of Electrical Power, Aerospace Engineering, Electronics and Telecommunications Engineering and (2) work in the electrical industry, electronics and telecommunications. Information from the site <https://forlap.ristekdikti.go.id/> that the number of lecturers in the S1 PTE study program UNESA the number of lecturers is 13, but the total number of lecturers in the Electrical Engineering department is 29, which is an addition from the Electrical Engineering Study Program 8 and from Electrical Engineering D3 Study Program 8. The number of students is 374 in the even semester of 2017, while there are additional 39 new students of 2018 S1 PTE.

**III. RESEARCH METHOD**

To reveal the implementation of PI or internship at PTE FT UNESA conducted through research with an expose facto approach. The study was conducted in the Department of Electrical Engineering. The research was conducted in odd and even semester 2017/2018 academic year. Students who were made the research subject were 130 students of S1 Electrical Engineering Education study program. The number of supervisors and examiners was 21 lecturers and 16 lecturers, and the number of industries where 32 students were PIs.

Data collection was carried out using documentation, observation and interview methods. Documentation methods were carried out to obtain documentation which included the JTE FT UNESA Industrial Practice Handbook, PI monitoring and evaluation, Industrial Practice Reports, results of industrial practice exams, single sign on (SSO) sites for UNESA and FORLAP DIKTI sites. The observation method is used to obtain an overview of the atmosphere and work description of the Industrial practice coordinator and PI lecturer. The interview method was conducted to obtain data to complete the data obtained through documentation and observation methods. The interview method was conducted to PI coordinators, PI supervisors, PI examiners, and students who programed PI courses. Data that has been collected is then analyzed using descriptive data analysis techniques.

**IV. RESULT AND DISCUSSION**

The number of students carrying out PIs in the 2017/2018 academic year which was started in September 2017 to February 2018 was 130 students of S1 Electrical Engineering (PTE) study programs.

*A. Suitability of PI Students with general requirements*

The general requirements of PI students are: 1) graduating from college  $\geq 6$  semesters,  $SKS \geq 120$ , and  $GPA \geq 2.0$ , 2) programming PI courses online, 3) providing transportation and accommodation costs, and 4) following debriefing. Table 1 shows the suitability of implementing PI Une PTE FT students with the general requirements of PI.

TABLE 1. SUITABILITY OF PI IMPLEMENTATION OF FT UNESA PTE STUDENTS WITH PI GENERAL REQUIREMENTS

General requirements	Suitability (%)
	S1 PTE Study Program Students
SKS $S1 \geq 120$ SKS	100
IPK $\geq 2,0$	100
Program at KRS Online	100
Following debriefing	91,7
Provide Transport	100
Average total	97,9

Based on some of the descriptions above and Table 1 shows students who carry out PI have met the general requirements of 97.9%. General requirements that are not fulfilled are attendance at the time of debriefing. There were 11 (8.3%) of 130 students who were late at the time of debriefing because they were conducting a survey of the PI's place.

*B. Suitability of Industrial Areas PI Place with Student Skills*

PI implementation of PTE Study Program students in government companies, State Owned Enterprises (BUMN) and 32 Private Industries spread across Surabaya, Sidoarjo, Pasuruan, Madiun, Gresik, Mojokerto, Tuban, Bojonegoro, and Jombang. Of the 32 companies and industries including 12 state-owned enterprises, 6 government and private companies 14. The percentage of industries managed by state-owned enterprises, government and the private sector is shown in Figure 1.

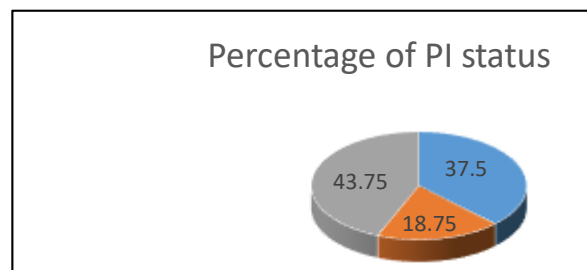


Figure 1. Percentage of industry managed by BUMN, government and private sector

Of the 32 industries, 28 (85.71%) industries in the field were in the area of expertise of students, 2 (7.14%) industries were not in accordance with the field of expertise, and 2 (7.14%) industries were not in accordance with the field of student expertise. Lack of conformity in 2 industries, namely PT INKA Madiun and PT Yesindo Sejahtera, because when PI 9 (6.92%) undergraduate PTE-Elkom students were placed in an electrical panel. Nonconformities occur in 2 industries, namely RRI and PT Sasa Inti. At RRI, 1 student came out because he felt that he was not in accordance with his field, namely TTL, so moving to PT AMZ took the field of Regulatory Engineering. While at PT Sasa Inti, 2 students with communication electronics were placed in regulatory techniques. So a total of 3 students (2.31%) are not in accordance with their fields. The lack of conformity and discrepancy in the industrial sector with the field of expertise of students is due to the implementation of

PI, the placement of students is not in accordance with the initial agreement, and not in accordance with the needs of the industry, as well as differences in perceptions of the industry. The suitability of the industrial sector and expertise areas of PI students is shown in Figure 2.

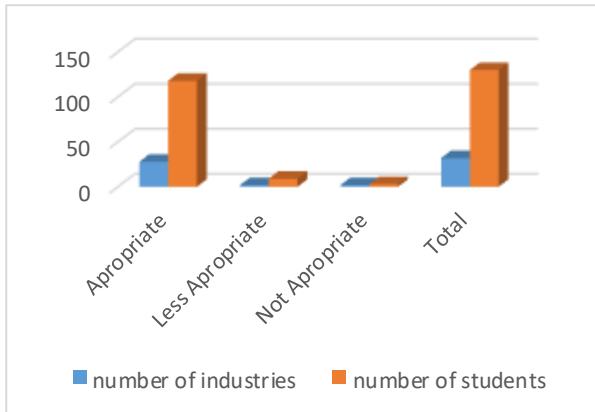


Figure 2. Suitability of Industrial Sector and Expertise Field of PI Students

### C. Mechanism of Implementation of PI in JTE UNESA

Students who have PI programs are given a briefing by the PI coordinator of each Study Program at the end of each odd semester. Debriefing uses the method of presentation, question and answer, discussion, and assignment. The debriefing material contains a summary of the PI Guide and development/innovation material from the PI coordinator team, including: 1) the scope and pattern of PI implementation, 2) description of PI material, 3) PI implementation procedures, 4) preparation of reports and evaluations of PI, 4) SOP PI JTE (development/innovation PI coordinator team), 5) PI management system, and special preparation.

Special preparations include: 1) report to the PI coordinator with a study result card (KHS), study plan card (KRS), and PI proposal, 2) submit a cover letter from the Dean of FT to the industry in the case of PI application, 3) ask and or waiting for the willingness of the industry, 4) submitting a reply from the industry to the faculty and PI coordinator, 5) submitting the supervisor, 6) downloading and filling in the format of the appointment of the mentor at <http://223.25.108.50/> and requesting approval from the supervisor, this is a development/innovation of the PI coordinator team, 7) filling in the file format monitor the progress of the PI in the PI coordinator, 8) consultation with the PI adviser on the PI report title topic plan.

The question and answer method was conducted after the presentation by the PI coordinator followed by the assignment method, students in groups held discussions and workshops on drafting the PI proposal. The results of the draft proposal are corrected and completed and refined for further use as PI proposals.

Based on some of the descriptions above, it shows that the debriefing material for students before implementing a PI is in accordance with the provisions in the PI Guidebook. Mentoring methods, presentations, question and answer, workshops, and assignments. Development and innovation related to debriefing are carried out by the coordinator at the time of debriefing by taking into account and considering efficiency, technological development and information relating to the management system and implementation of the PI.

### D. Monitoring and Evaluation of Industrial Practices

The PI implementation of each study program is regulated by the PI coordinator. The main task of the PI coordinator is to regulate the administration of licensing and submission of PI administration, the mechanism for implementing PIs, guidance, monitoring and evaluation of PI implementation.

PI monitoring is carried out once a year and is part of the department's work program. The purpose of Monitoring is to see the development and input/criticism/suggestions from users on the internship being carried out. Because the users are part of the study program stakeholders in the process of receiving internships or employees. Some criticisms and suggestions are input for the study program to improve in terms of curriculum, behavior and competence. In addition, it was also discussed in relation to the plan of cooperation for placement of internship students for the next few years. The monitoring mechanism is carried out by assigning several supervisors to monitor the company or industry where the student is conducting industrial practice, but not all industries are visited because of the limited cost factor.

After doing PI, students are expected to be able to improve their skills and abilities in applying the theories obtained in lectures to implementation practices in industry or companies, so that students better understand the field of work that has been practiced. To measure and provide an assessment of the success of students in carrying out PI activities, an evaluation was conducted by industry/company supervisors, supervisors and examiners. Industry/company advisors provide an assessment of the aspects of knowledge, skills, personality of the students which are detailed into: quality of work performance, discipline/obedience, responsibility, honesty, cooperation, and creativity. The supervisor is responsible for examining and examining student PI reports, while the examiner is tasked with examining the student PI report [10].

Based on some of the descriptions above shows that monitoring and evaluation of PI implementation is still not good. In the future, a breakthrough must be made by the Head of Department, Head of Study Program and PI coordinator by improving and utilizing the budget for monitoring and evaluating the implementation of PI in an efficient, effective and programmed manner.

## V. CONCLUSION

The conclusions of the results and the discussion are: 1) Implementation of an internship or industrial practice of Electrical Engineering Education undergraduate students, the Faculty of Engineering UNESA is in accordance with the industrial practice manual issued by the UNESA Faculty of Engineering, but the implementation of PI monitoring and evaluation needs to be improved. 2) Planning the management of partnerships with the business and industry world for students of Electrical Engineering Education students has been well established and has spread to private industry, government and BUMN.

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