

Penjelasan tentang gambar (SO_EVAL_RESULT):

The evaluation results in terms of performance indicator of student outcomes (SO) as described in Table 3.1 is shown in Figure XXX. For each student outcomes, there are four types of measurement called rubric, survey, average and target. The rubric data is obtained from the performance indicator measurement of selected courses in EEPS as shown in Tables 4.2-4.4. Meanwhile, the survey data is taken from questionnaires spread to students regarding the student outcomes performance indicator. Another average data indicates the mean value between the rubric and average data. The last type of measurement is the target that considers the rubric grade point in direct assessment method in Table 4.1. In our EEPS, the target is similarly selected to 3.0 (=proficient) to all criteria of student outcomes.

Much attention goes to the student outcomes related the basic science skills, i.e SO-1 and SO-2. In these cases, all types of measurement below the target value. The SO-1 is pretty close to the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics. Meanwhile the SO-2 is about the capability of students to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. The average value of SO-2 is lower than SO-1. Therefore, it is necessary to improve the basic learning capability of students in order to match with the analyze capability in engineering design. In this respect. The strengthening of understanding the fundamental subjects in electrical engineering including the applications of these subjects and topics are totally needed.

There are data variety of performance indicator regarding the EEPS student outcomes. Nevertheless, the data deviation between types of measurement is considered less significant. The recent condition, only the average value of SO-3 is slightly beyond the target. This type of student outcome is related to the professional skills where the students are capable and confident to speak and discuss different topics and subjects with a range of audiences. The result indicates the high capability of EEPS students to develop and establish their carriers after the graduation. Later, it can be seen that the EEPS alumni successfully work in different fields. In addition, the other professional skills as a part of SO-4, the average value is still slightly less than the target. In this respect, the improvement is needed to increase the ability to recognize ethical and professional responsibilities in engineering situations including understanding the impacts in any contexts. The students can be sent to participate company training or pre-on job training in engineering company.

High potency can be continuously improved to reach the target of leadership of students by sent them to out-field training in communities or in enterprise business management. Similar to average of SO-4, the student outcome of SO-5 which related to entrepreneurship skills has the survey over the target. In this regard, our students have high confidence in leadership and team work to collaborate and easily adapted in new environment to design goals, plan tasks, and meet objectives. The results indicate that our students are capable to work not only in the field related to electrical engineering subjects but other and different types of business.

Although the average performance indicator is still slightly below the target, the student outcome of SO-6, which related to research skills has the survey data is over than the target. It indicates that the EEPS students may involve and participate well in the electrical engineering research and development due to the high ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to

draw conclusions. This result seems not directly supporting the other student outcome in SO-7 which indicated with lower survey and average data than the target. Much efforts are needed to enhance the confidence of students to utilize new knowledge for special problem-solving tasks and to increase the creativity in learning strategies. The efforts can be performed by sending the students intensively to research centers in order to perform special tasks in electrical engineering subjects.

The more detailed overview of performance indicator of student outcomes in two semesters per year between 2015 and 2018 is shown Figure VVV. The year and semester are indicated as year (semester). For example 2015 (1) means the measurement was conducted in 2015 after finishing the first semester. Therefore, the achievement of student outcomes can be viewed in terms of year and the completed semester. It is expected that there is improvement of performance indicator for every student outcomes yearly and every semester.

The student outcomes which related to the Basic Science Skills, the SO-1 and SO-2 show the steady improvement in every semesters. In the first semester, the SO-1 reached the target in 2016 and remained steady about the target in 2017, while the constant value between 2015 and 2016, then increase little below the target in 2017. In comparison, the SO-2 shown continued increase of both semesters performance indicator from 2015 to 2017. The trend has given the optimistic results to reach beyond the target value to improve the capability of students to understand the basic principle in electrical engineering studies and to implement the theory in engineering practice and design.

Meanwhile, the professional skills as parts of SO-3 and SO-4 yield different results. The SO-3 reaches the beyond the target value and shows constant increase of both semesters performance indicator between 2015 and 2017. In this case, our students have good and confident capability in speaking and discussing different subjects and topics. A little different results is shown in SO-4 which related to professional and ethical responsibility in engineering practice. Although the data trend rises steadily, the performance index achievement is still lower than the target value. Much efforts are totally needed to bring the students more closely to understand the engineering practice responsibility in any technical projects or in the field project implementation. In comparison, the entrepreneurship skills in SO-5 has shown the constant rise of performance indicator to almost reach or little below the target value. It indicates our students in the right track to have the capability of leadership and teamwork in specific environment.

The student outcomes regarding the research skills in SO-6 and SO-7 yield interesting results with different trend. The capability of students to develop research, to analyze and interpret data, to proceed engineering method and to draw conclusion in SO-6 might reach beyond the target value. It is expected that the trend can be continuously maintained in future to make our students have high creativity in conducting the research activities. However, there is significant decreases of performance indicator of SO-7 in both semesters after 2017. It seems that the level of SO-7 is quite high for undergraduate students. They might have less confident when dealing with advanced learning strategy with new learning and knowledge approaches. Nevertheless, much efforts are needed to return the low achievement values on the target track by provision the much opportunity for students to have on-sit training in research institutes.

