

# PERCEPTION AND USE OF SCOPE ELECTRONIC TRAINER KIT BY STUDENTS IN TEACHING & LEARNING PROCESS

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**Abstract:** Scope Electronics Trainer is a device that functions as a tool for the teaching and learning process and also for testing electronic circuits. With this trainer kit, research in the field of electronic engineering can be carried out easily and the cost of the study is cheaper as these tools have a reasonable price. This trainer is a combination of three instruments in one trainer including the DC power supply, the oscilloscope, and the function generator. This study aimed at investigating the perception and use of trainer kits in the teaching and learning process. The effectiveness of using this trainer kit in educational settings has been evaluated through a survey on students 25 students that had attended Electrical Technology and Measurement course and used this trainer in their practical work in December 2018 session at the Department of Electrical Engineering in Politeknik Mukah. Research data analysis is using the statistic method to find mean score to get the overall rating of the trainer kit and student's perception and the response has been positive, with the total average mean achievement was 4.80 of the correspondence has shown positive feedbacks, indicating the usefulness of the trainer kit. This trainer kit will give students a great deal of practical work in laboratories and also improve the teaching and learning sessions in the classroom.

**Keywords:** *Trainer kit, teaching and learning process, practical work.*

## 1. Introduction

In the field of knowledge and technology lately develops with rapid development with the advancement of science and technology that produces innovations that lead to a better direction. The advancement of technologies keeps on changing and transforming the teaching method and the setting of the learning process (Dunwill, E. 2016).

Therefore, we have reviewed the appropriate project or technology to facilitate students in conducting electronic engineering studies. Training modules have arisen hand in hand with innovations in laboratory teaching especially in electronics laboratories for they offer actual simulations of the topic being discussed, enabling the students to safely explore their curiosity with these devices (Arnel M et al. 2015).

Many graduate students have not been able to meet the qualifications as required by institutions Technical and Vocational Education and Training (TVET). These symptoms indicate that learning in the education of electronic engineering has not been able to provide a learning experience on the cognitive and psychomotor of students. In learning basic electronics needed a good understanding of the students of this course is the knowledge base

that is used to understand how electronic circuits work, therefore the availability of the module as a source of theoretical knowledge and the trainer as a training tool should be considered as a factor that affects the results of learning students (Sahat 2014). The electronics trainer is very expensive to obtain and normally available in limited numbers in electronic laboratories. Moreover, due to the limited numbers of units, students need to share the trainers and this reduces the contact times of each student to use the trainer (Intan et al. 2018).

An alternative to overcome this problem, the Scope Electronic Trainer Kit (as shown in Figure 1) is developed and revised. This research aims to determine the effectiveness of the trainer kit in the teaching and learning process. Electronic trainer board has become increasingly popular in a wide range of applications in teaching and learning method (K. & B. Ajao. 2014). Scope electronic trainer kit is a combination of three instruments in one trainer including the dc power supply, the oscilloscope, and the function generator. The power supply is a dc supply with a maximum of 12Vdc. The function generator is ac supply with three variations of wave: sine, square, and triangle with 1 MHz maximum frequency supply. The oscilloscope is a scope display of waveform for circuit analysis in a digital graphic view.

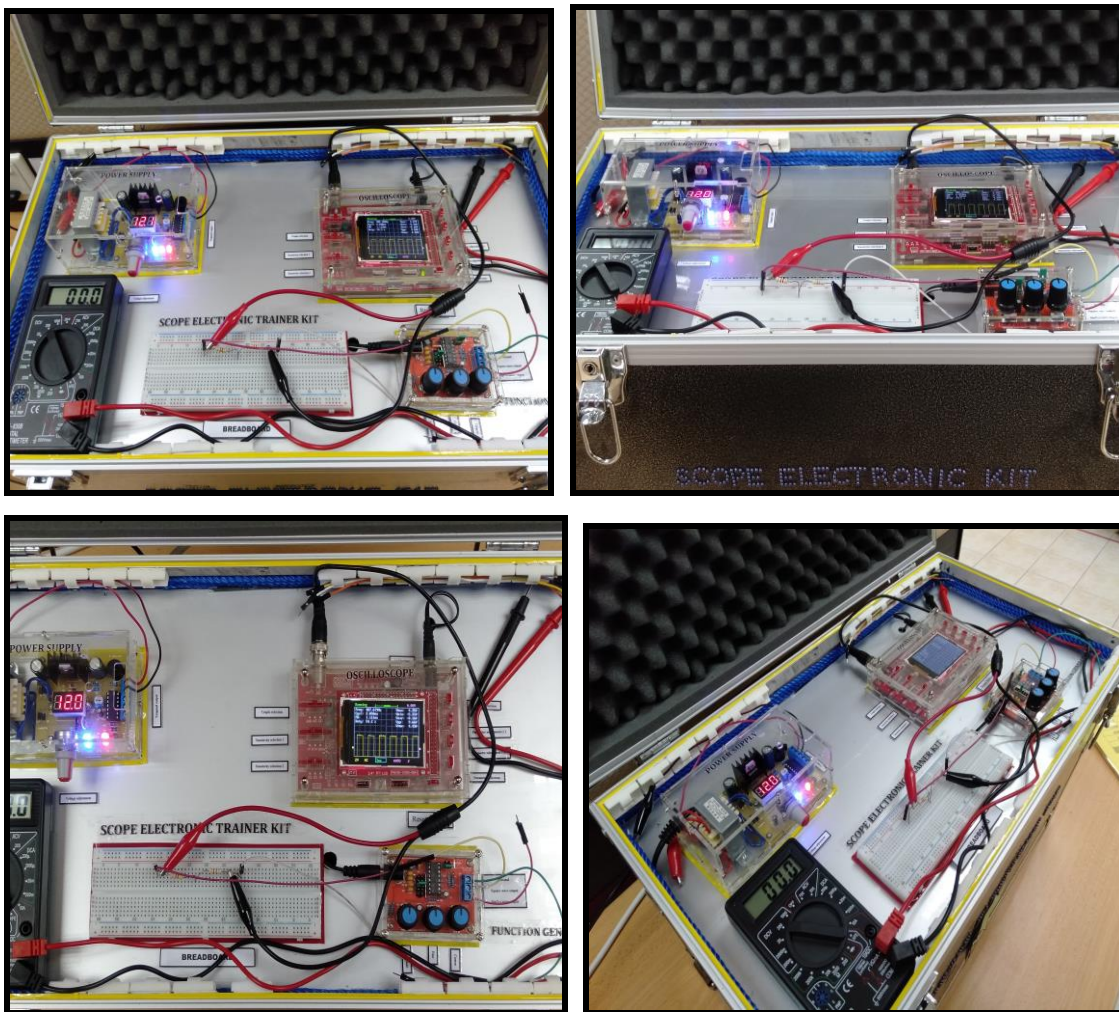


Figure 1. Scope Electronic Trainer Kit

The set is compact and portable so students can begin the practices in the study center and continue with them at home to increase the knowledge acquired. With the help of this trainer, it is possible to cover basic electronics courses in Industrial Training Institutes, Degree Colleges & Vocational Schools. This trainer is suitable to be used in the lab as a teaching aid and demonstrates the principle of electronics law.

## 2. Methodology

### Questionnaire

Section A of the questionnaire is a survey of the background and biographical information of respondents. The main evaluation of this trainer is in Section B. Question 1 to Question 5 is to determine the effectiveness of this trainer to be used in practical work. Question 6 and Question 7 are to determine how far students can apply knowledge learned in real-life applications. Question 8 and question 9 are to determine the effect of using this trainer in practical sessions in terms of communication and participation. Question 10 and Question 11 are to evaluate the level of difficulty to use this trainer. Lastly, Question 12 to Question 14 is to the relationship between the uses of this trainer to the development of the Final Year Project.

### Sample

The questionnaire is done on 25 students that had attended Electrical Technology and Measurement course and used this trainer in their practical work in December 2018 session.

### Data Analysis

The research data analysis is using the statistic method to find mean score for range low, average, and high frequency to get the overall rating of trainer and also student's perception of using this trainer in their practical work in Table 1.

Table 1. Interpretation of mean score

Range of mean score	Frequency, <i>f</i>
1.00 – 2.33	Low
2.34 – 3.67	Average
3.68 – 5.00	High

(Source: Landell, 1997)

### 3. Results

Table 2 below shows the respondents' consent through a response strongly disagree, disagree, neutral, agree and strongly agree with the perception and use of the Scope Electronic Trainer in percentage, frequency, and a mean score based on items 1 to 14 in the questionnaire.

Table 2. Respondent's Consent

Aspects	Respondent's Consent					Mean Score
	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	
	<i>f</i> = %	<i>f</i> = %	<i>f</i> = %	<i>f</i> = %	<i>f</i> = %	
1. The Scope Electronic Trainer kit is useful for the laboratory session of Electrical Technology & Measurement course	0 = 0	0 = 0	0 = 0	0 = 0	25 = 100	5.00
2. I able to apply the knowledge learned when using Scope Electronic Trainer.	0 = 0	0 = 0	0 = 0	2 = 8	23 = 92	4.92
3. The Scope Electronic Trainer Kit is suitable for Electrical Technology & Measurement course.	0 = 0	0 = 0	0 = 0	4 = 16	21 = 84	4.84
4. It is interesting when Scope Electronic Trainer Kit is used in the laboratory session.	0 = 0	0 = 0	0 = 0	0 = 0	25 = 100	5.00
5. The Scope Electronic Trainer Kit is relevant to your knowledge level.	0 = 0	0 = 0	0 = 0	4 = 16	21 = 84	4.84
6. The Scope Electronic Trainer Kit helps in laboratory assessment.	0 = 0	0 = 0	1 = 4	4 = 16	20 = 80	4.76
7. Usage of Scope Electronic Trainer Kit enhances practical skills.	0 = 0	0 = 0	2 = 8	3 = 12	20 = 80	4.72
8. The Scope Electronic Trainer is important in building two-way communications during laboratory sessions.	0 = 0	0 = 0	4 = 12	5 = 8	16 = 64	4.48
9. The use of the Scope Electronic Trainer Kit in laboratory sessions preparing me to more fully participate in the session.	0 = 0	0 = 0	0 = 0	4 = 16	21 = 84	4.84

10. The Scope Electronic Trainer Kit is easy to use	0 = 0	0 = 0	0 = 0	1 = 4	24 = 96	4.96
11. The modules of the Scope Electronic Trainer Kit are easy to assemble.	0 = 0	0 = 0	0 = 0	3 = 12	22 = 88	4.88
12. The Scope Electronic Trainer Kit gives ideas in developing the Final Year Project.	0 = 0	0 = 0	3 = 12	2 = 8	20 = 80	4.68
13. The applications of Scope Electronic Trainer helps in strengthen the project development skills.	0 = 0	0 = 0	2 = 8	4 = 16	19 = 76	4.68
14. With skills learned during laboratory sessions using the Scope, the Electronic Trainer kit can be applied to the Final Year Project.	0 = 0	0 = 0	3 = 12	4 = 16	18 = 72	4.60
<b>Total Mean Average</b>						<b>4.80</b>

#### 4. Discussion

The responses from 25 students show a positive impact of using this trainer in practical work with an average mean score of 4.80. This means that this trainer is suitable to be used for practical work and they are satisfied with this trainer.

According to Table 2, Q1 and Q4 were scored 5.00 in mean reading, shows that all students strongly agree that this trainer is useful for laboratory sessions of the Electrical Technology & Measurement course and students felt interested to learn when using this trainer.

According to Q2, with a mean score of 4.92 shows that a lot of students agree that they can apply the knowledge they had learned when using this trainer. This shows a positive impact on the teaching and learning process and this trainer is very effective to apply practical skills in real life.

Q8 and Q9, with the same reading of mean score 4.68, shows that two-way communication is build up with more discussion and conversation in the laboratory session. Also, students are more participate in that session since they need to do programming work and at the same time; they need to assemble this trainer to work as desired. However, from Q10 and Q11, students felt that they were more fully participated and easier to use in the laboratory session.

From Q12 to Q14, this trainer not only useful in Electrical Technology and Measurement course but also gives ideas in developing Final Year Project and all the skills learned during laboratory sessions using this trainer can be applied in Final Year Project.

## 5. Conclusion

This project is successfully developed and used in laboratories session. These scope electronic kits perfectly suitable for hands tests on experience in construction and testing and also it should be useful in supporting repair and testing and also perfectly suitable for tests to implement the basic knowledge for many electronic professions.

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