Evaluation of facilities learning practice at the Vocational High School in Electrical Engineering

S Soeprijanto*, Y F Yahya and E Media
Faculty of Engineering, Universitas Negeri Jakarta, Jakarta, Indonesia

*Soeprijanto@unj.ac.id

Abstract. This study aims to determine the level of feasibility of practical facilities and equipment in the Private Vocational High School Electrical Engineering in the East Jakarta environment. The research method used is the Discrepancy Evaluation Model. The problems raised in this study are the extent of the feasibility of the space and equipment of the practice of electric power installation programs in Private Vocational High Schools in the East Jakarta region if examined from the National Standards for Vocational High School Facilities and Infrastructure in Indonesia. The research samples were 4 schools; determination Sample schools are conducted by proportional random sampling. The research was conducted in the 2017/2018 school year. The results showed that: (1) All (100%, N = 4) sample schools had a facility of electrical Power engineering installation the form of instructional space and practice space in conditions worthy. (2) All sample schools did not have a Basic Electrical Engineering laboratory. (3) When viewed from the standards of the Vocational High School practice equipment available in the basic installation practice room for Electric Power, in all sample schools were inadequate. Conclusion This study: shows that private Vocational High Schools in East Jakarta already have the facilities electrical practice is in the form of instructor rooms and practicum rooms, but it is not full supported by adequate practice equipment. The implication of this study is that private vocational schools in the East Jakarta environment need to meet the additional Electrical power plant installation equipment according the regulation Minister of Education and Culture Republic Indonesian number 34 of 2018 about National standard of vocational high school’s facilities.

1. Introduction
Vocational education is secondary education that prepares students primarily to work in certain fields. as part of the National Education SMK / MAK aims to produce skilled workers who have the ability in accordance with the demands of the needs and requirements of employment, as well as being able to develop their potential in adopting and adapting to the development of technology and art [1].

In an effort to realize the objectives of Vocational Education, adequate facilities and infrastructure are needed to support the implementation of quality learning [2]. The availability of facilities and infrastructure is regulated in the National Education standard. National Education Standards (SNP). SNP is a minimum criterion of the education system in all the jurisdictions of the Unitary State of the Republic of Indonesia. SNP scope includes (1) Standard content, (2) Standard process, (3) Graduate standard program, (4) Standards for educators and education personnel, (5) Standards for facilities and infrastructure, (6) Management standards, (7) Financing standards and (8) Educational assessment standards. Especially for Vocational High Schools (SMK) [3].
The Electrical Power Engineering Expertise Program is one of the vocational expertise programs. The area of expertise that must be mastered in the Electricity Installation Engineering Expertise Program is able to install a building's electric lighting installation, install a building electric power plant, operate an electromagnetic control system and maintain electrical panels and switchgear. The electricity system must be studied by all students in the Electrical Installation Engineering Expertise Program at each Vocational High School. Considering that electricity expertise is important in the industrial world and as electricity develops, the facilities and infrastructure of electricity practice need to be considered as an effort to produce quality graduates. The availability of facilities and infrastructure practices in accordance with the standards set by the government are expected to improve the quality of vocational graduates, especially in the field of skills, besides that it will also help the readiness of students to enter the workforce along with technological advancements like today.

The research problems raised were as follows whether the facilities and infrastructure of the practice room in the Vocational High Schools of Electric Power Installation Engineering Expertise Program in East Jakarta district are in accordance with National Standards for Vocational Secondary Education the Regulated Number 34 of 2018.

2. Research method
This research was conducted at the Vocational High School that has an Electrical Installation Engineering Expertise Program located East Jakarta, this research was conducted in 2017-2018. The method of this research are used Discrepancy Evaluation the Discrepancy Evaluation Model (DEM), developed in 1966 by Malcolm Provus, provides information for program assessment and program improvement. Under the DEM, evaluation is defined as the comparison of an actual performance to a desired standard [4]. Model with mixed method between descriptive quantitative and qualitative methods. Data retrieval is done through observation and document study. Observations will be made on the object to be studied, namely the facilities and infrastructure of the practice room of the electrical power installation technical expertise program in East Jakarta, by observing directly and taking data by observing and collecting data on the object of research. After obtaining the data, it will be evaluated by means of the data obtained will be compared with the criteria or standards that have been set, namely the regulation of the minister of national education of the Republic of Indonesia Number 34 of 2018 concerning national standards facilities and infrastructure of SMK / MAK.

Evaluation of this program was carried out on the practice facilities and infrastructure of the Electricity Installation Engineering Expertise Program for Vocational High Schools The evaluation approach used is the gap evaluation model or inequality evaluation model. The Provus program gap evaluation model aims to analyze a program so that it can be determined whether a program can be determined whether a program is feasible to be continued, improved or should be stopped. The evaluation components include practice room facilities (furniture, equipment, educational media, other equipment) and practice room infrastructure (area, capacity, ratio, width).

3. Research result

3.1. Practice room
The evaluation results from the components of the practice infrastructure (practice room) of the Electrical Installation Engineering Expertise Program (area, capacity, ratio, width) cover all aspects assessed and presented in accordance with the conditions in the field. To obtain the results of the evaluation, instruments were used in the form of observation, interviews and documentation. The results are as follows:
3.2. Equipment laboratory facility
The evaluation results from the components of the practice room for the Electric Installation Engineering Expertise Program (furniture, equipment, educational media, and other equipment) cover all aspects of assessment and presentation in accordance with conditions in the field. To obtain the results of the evaluation, instruments were used in the form of observation, interviews and documentation. The results are as follows:

3.2.1. The schools sample 1. The main equipment observed in this work area is 15 equipment. Determination of this equipment is based on the use of the equipment when practicing. The equipment is qualified to be a measuring instrument, hand tools and supporting equipment. The measuring instrument is a multimeter 10 pieces. For hand tools in the form of 18 pieces of combination pliers, 15 pieces of cutting pliers, 15 pieces of sharp pliers, 20 pieces of paring pliers, 13 screwdrivers and 13 screwdrivers - 15 pieces, 8 pieces of hammer for panel components that are observed, the results are
sufficient to meet the needs of students. Supporting equipment observed in the Electric Power Engineering expertise program room, in the form of clamp ampere meter 1 piece, megger 1 piece.

3.2.2. The school sample 2. The results of the research on the electrical installation practice room facilities of the school sample 2. there were 32 seats in the practice room. The table in the practice room has 8 pieces made lengthwise measuring 0.5 x 2 m. he made a long table to facilitate students when practicing, because it was hoped that one group of students could be in one place. The tool and material storage cabinets in the practice room of the Electric Power Engineering expertise program are one set, used for storage of equipment and materials.

The main equipment observed in this work area is 30 equipment. Determination of this equipment is based on the use of the equipment when practicing. The equipment is qualified to be a measuring instrument, hand tools and supporting equipment. The measuring instrument is a multimeter 10 pieces. For hand tools in the form of a combination of 26 pieces, 36 cutting pliers, 15 pieces of pointed pliers, 15 pieces of paring pliers, 11 pieces of screwdriver and 11 pieces of screwdriver - 13 pieces, 8 pieces of hammer for panel components observed were 5 panel pieces, 1 phase MCB 20 pieces, 3 phase MCB 11 pieces, 25 pieces magnetic contactors, 20 thermal overload relays, 16 delayed time relays. Supporting equipment observed in the practice room of the Electric Power Engineering expertise program, in the form of an ammeter clamp of 2 pieces, has a size of 1 piece.

3.2.3. Schools sample 3. The results of the instructor's space facilities at the Malacca Electric Power Installation Engineering Expertise Program have facilities for storage space and instructors including furniture, equipment, educational media, and other equipment. Observed furniture includes tables, there are 2 units, chairs have 4 units, cabinets store tools and materials, there is 1 set and rack of tools and materials there is 1 set. Equipment that is observed regarding equipment for spaces that have 1 set. Educational media observed regarding data boards that are not available in this space. Other equipment observed in the Instructor room consists of a contact box that has 4 pieces, and 1 bin.

The main equipment observed in this work area is 30 equipment. Determination of this equipment is based on the use of equipment when practicing. Equipment is qualified to be a measuring instrument, hand tools and supporting equipment. The measuring instrument is a multimeter 12 pieces. For hand tools in the form of a combination of 35 pieces of pliers, 28 pieces of cutting pliers, 8 pieces of pointed pliers, 24 pieces of paring pliers, 17 pieces of screwdriver (+), 24 pieces of screwdriver (-) and 8 pieces of hammer. For panel components observed in the form of 5 panel panels, 1 phase MCB 1, 3 phase MCB 3 pieces, 40 pieces’ magnetic contactor, 16 overload thermal relay, 16 time delayed relay relays. Supporting equipment observed in the practice room of the Electric Power Engineering expertise program was in the form of an ammeter clamp of 3 pieces and 1 piece of drum.

3.2.4. School sample 4. The results of the research on the technical practice room facilities of the electric power installation Electrical Engineering Installation Expertise Program has a means of furniture the practice room evaluated is a work desk, work chair and storage tool and materials. Based on the results of the research in the practice room of the electric power engineering electric power program, there were 18 seats in the practice room. The table in the practice room has 18 pieces. The tool and material storage cabinets in the practice room of the Electric Power Engineering expertise program are one set, used for storage of equipment and materials.

The form of 14 pieces of combination pliers, 14 pieces of cutting pliers, 16 pieces of pointed pliers, 1 piece of paring pliers, 22 pieces of screwdriver (+) and screwdriver (-) 8 pieces, 17 pieces of hammer. The panel components observed were 9 panel boxes, 10 phase MCB 1, 3 phase MCB 10 pieces, 44 pieces’ magnetic contactors, 16 overload thermal relays, 11 pieces delayed time relays. Supporting equipment observed in the Electric Power Engineering expertise program room, in the form of clamp ampere meter 2 pieces, 1-meter megger.
Educational media in the form of a blackboard. In this practice room there is a blackboard in the form of a whiteboard. Learning support equipment in the form of a contact box and trash can is the last aspect to be observed. Based on the results of observations, there is one trash can and 10 contact boxes.

4. Discussion
The results of this study are in accordance with the findings of the Study conducted by Yusro et al. [5]. The level of availability of machine work area is equal to 55%, electricity work area is 36%, chassis work area is 39%, storage space for equipment and materials 121%, instructor's room is 84% so it is categorized as less feasible because it is only the area of the instructional space already axis. The results of this study are in accordance with the findings of the Study conducted by Fito Tesis about the Availability of Practical Facilities and Equipment Based on the National Education Standards Agency (BSNP) standards in the Welding Engineering Department, SMK Negeri 1 Sedayu, Bantul, Yogyakarta, it was found that [6]: (1) Level of Availability of Practical Facilities and Equipment Not Complying with BSNP Standards; even Fito Setiawan in his second study in 2014 on the Feasibility Study of Electricity Facilities and Infrastructure Facilities at Muhammadiyah Prambanan Senior Vehicle Engineering concluded the same thing where the feasibility of light vehicle electrical engineering infrastructure in Prambanan Muhammadiyah Vocational School was not feasible (41.106%), and the feasibility of Light Vehicle Engineering Electricity Facilities at Muhammadiyah Prambanan Vocational High School (66.95%) [5]. This is in accordance with the findings of Aap Pandriana who voted on State Vocational High School The results of this study are the availability of practical facilities and infrastructure in expertise competencies TKR at SMK Negeri 1 Soreang is still not fully achieved according to the Standard.

5. Conclusion
Based on the data results of research about Facilities and Infrastructure of the Practice Vocational high schools of the Expertise Program of Electric Power Installation in Vocational Engineering in East Jakarta and then compare with National Standard Facilities of Vocational High Schools can be make conclusion that: The private Vocational High Schools in East Jakarta already have the facilities electrical practice is in the form of instructor rooms and practicum rooms, but it is not full supported by adequate practice equipment. The implication of this study is that private vocational schools in the East Jakarta environment need to meet the additional Electrical power plant installation equipment according the regulation Minister of Education and Culture Republic Indonesian number 34 of 2018 about National standard of vocational high school’s facilities.

Recommendation
Based on conclusions, and the discussion above can be recommended, the following:

- All Vocational Schools must follow the national standards for Infrastructure and Practice Equipment as in the Indonesian Minister of Education Regulation No. 34 of 2018
- Especially basic electrical laboratories. The government needs to provide assistance so that all schools have a laboratory.
- There needs to be an increase in practice space infrastructure, such as extensive practice space for electric power installations, so that the broad ratio of practice space to the number of students
- There needs to be additional equipment, educational media and other equipment components, according to the ratio of the number of tools with students as stated in the Regulation of the Minister of National Education No. 34 2018.

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