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Evaluation of learning program subjects for building utility systems based on facilities and infrastructure standards using the CIPPO model at SMK N 2 Banda Aceh

Dian Ahzaliza[1*], Hasan Maksum[2], Wakhinuddin[2] and Eko Indrawan[3]

[1] Postgraduate of Technical and Vocational Education, Faculty of Engineering, Universitas Negeri Padang, **INDONESIA**
[2] Department of Automotive Engineering, Faculty of Engineering, Universitas Negeri Padang, **INDONESIA**
[3] Department of Mechanical Engineering, Faculty of Engineering, Universitas Negeri Padang, **INDONESIA**

[*]Corresponding author: lampalohcity@gmail.com

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Abstract—Based on interviews at SMK Negeri 2 Banda Aceh in 2021, obtained from 25 students, 4 people did not pass the skills test in the subject of building utility systems, with an average knowledge score of 79.2 and an average skill score of 78.4 One of the factors is the inadequate infrastructure in carrying out the learning process, especially practicum learning. The purpose of the study was to evaluate the learning process of building utility system subjects in the Construction and Property Engineering Expertise Program using the CIPPO model at SMK Negeri 2 Banda Aceh City. This research is an evaluation research using the CIPPO model, namely the evaluation of the context, input, process, product and outcome. The type of research is a mixed method with Concurrent Triangulation Strategy. Sources of qualitative data were obtained from the Principal, Deputy Principal of the School of Facilities and Infrastructure, Head of the Construction and Property Engineering Expertise Program, Head of Lab and 5. Teachers who teach building utility systems at SMK Negeri 2 Banda Aceh. Quantitative data were taken from 40 students of class XII and XIII. The results showed that the context component was in the sufficient category (73.59%), the Input component was in the sufficient category (75.69%), the process component was in the sufficient category (72.01%), the Product component was in the sufficient category (66.5 %), and the outcome component is also in the sufficient category (73.25%). Because all components are in the sufficient category, it is recommended to make appropriate improvements to improve student achievement abilities in the subject of building utility systems in the Construction and Property Engineering Expertise Program at SMK Negeri 2 Banda Aceh.

Keywords: *Evaluation, Learning Programs, CIPPO, Facilities and Infrastructure*

I. INTRODUCTION

Efforts to shape the life of the nation and develop education are aimed at strengthening the quality and dignity of Indonesian human beings. Improving the quality of education must be achieved by improving the quality of education and education personnel. In addition, curriculum renewal is in line with the development of science and technology as well as the provision of adequate educational facilities and infrastructure (Kompri, 2015).

Based on data from The Learning Curve Pearson in 2014, the ranking of the world of education states that Indonesia ranks last in the world in terms of the quality of education. Indonesia ranks 40th with an overall ranking index and a score of minus 1.84. Presidential Regulation Number 9 of 2016 concerning the Revitalization of Vocational High Schools (SMK), which was followed by a memorandum of understanding between related ministries, became the driving force of vocational education in Indonesia (Kemendikbud, 2017).

Improving the quality of vocational education requires infrastructure that makes it easier for students to apply the theories that have been obtained at school. Infrastructure needs such as laboratories, teaching factories and technoparks are still lacking in educational institutions. The allocation of infrastructure has been planned by the SMK Directorate as a form of support. The assistance includes providing assistance for the construction and renovation of school equipment rooms, procurement of practical equipment and laboratory rehabilitation.

Realizing quality and quality education requires good education program planning. To achieve quality education, it is necessary to consider the factors that influence it, the right strategy, planning steps and evaluation or assessment criteria (Aslan D & Gunay R, 2016). Evaluation is very important to do to improve the school system and see the achievement of the goals that have been set in an effective and productive way in results, it is necessary to monitor the established process at clear intervals. Only through feedback from system users and identification of problems that arise, can the system's flaws be corrected. Based on research by Akpur etc (2016), found problems that teachers and students were worried about things such as how to balance skills, learning resources in the form of audio visuals, not having study habits in groups, and differences in skill abilities in each area.

Data obtained from the interview with the Deputy Chairperson of LMPT 2020 by one of the online media, stated that the quality of senior secondary education in Aceh Province occupies the lowest position at the national level. This was revealed from the Higher Education Entrance Test Institute (LTMPT), where the average assessment of the Scholastic Potential Test (TPS) of school students from all provinces in Indonesia who took part in the UTBK SBMPTN, Aceh Province was recorded as one of the provinces with the lowest TPS scores nationally, Aceh's position is in line with several provinces in eastern Indonesia, such as Maluku, North Maluku, NTT, Papua, and several other provinces in Sulawesi.

Based on the interview that the author conducted with the Head of the Workshop (Laboratory) of the Construction and Property Engineering Expertise Program at SMK 2 Banda Aceh City in May 2021, that learning in the Construction and Property Engineering Expertise Program has low value quality. Data for 2020, obtained from 40 students, obtained 4 people who did not pass the skills test in the subject of building utility systems, with an average knowledge value of 79.2 and an average skill score of 78.4. Inadequate infrastructure was found in carrying out the learning process, especially practicum learning.

The curriculum used is the 2013 curriculum, where the curriculum is required to be industry-based, that is, there is an alignment between the school curriculum and the industrial curriculum. Learning is difficult to implement in accordance with the demands of the curriculum because the equipment used is partly irrelevant to the development of the construction world, for the equipment in the Construction and Property Engineering Expertise Program is equipment procurement in 2008, and there has been no equipment renewal until 2021, so the development of the construction world cannot be practiced Directly, practical learning cannot be implemented as a whole, so it is more theorized for competencies for which no practical tools are available. This results in the incompatibility of the Learning Process Plan (RPP) with the syllabus applied by the teacher in the learning process and results in not achieving the Minimum Mastery Criteria scores. (KKM) and the time allocation specified in the syllabus and resulted in reduced student motivation in undergoing the learning process, especially practicum.

Sadrina & Nasir have conducted research at SMK Negeri 2 Banda Aceh City in 2017 regarding Assessment of the implementation of Engineering Learning activities (an observational study), it was found that the curriculum used was the 2013 curriculum and the school had implemented creative learning methods, such as, problem-based learning, project-based learning, project-based instruction, inquiry and cooperative learning. However, there has never been a study on the evaluation of learning programs.

The Construction and Property Engineering Skills Program at SMK Negeri 2 Banda Aceh City has never evaluated the implementation of learning programs, especially the subject of building utility systems which are reviewed based on infrastructure standards. Given the importance of learning programs for improving the quality and quantity of vocational education in Indonesia, especially Banda Aceh, it is necessary to evaluate the learning programs that have been carried out using the CIPPO model evaluation.

II. METHODS

This research is an evaluation research using the CIPPO model, namely the evaluation of the context, input, process, product and outcome. The method used is a mixed method with a Concurrent Triangulation Strategy design. The research was conducted at the Construction and Property Engineering Expertise Program at SMK Negeri 2

Banda Aceh from July to August 2021. The quantitative research sample used a sampling technique with a total population, which took all students of class XII and XIII, totaling 40 students. Qualitative research informants are:

1. Principal of SMK Negeri 2 Banda Aceh
2. Deputy Principal of the School of Facilities and Infrastructure at SMK Negeri 2 Banda Aceh.
3. Head of the Construction and Property Engineering Expertise Program at SMK Negeri 2 Banda Aceh
4. Head of the Construction and Property Engineering Expertise Program Lab at SMK Negeri 2 Banda Aceh
5. Teachers who teach the subject of building utility systems in the Construction and Property Engineering Expertise Program at SMK Negeri 2 Banda Aceh

Quantitative instruments use a questionnaire that has been tested for validity, and quantitative research by means of structured interviews and observation.

III. RESULTS

A. Component context

In the context component, there are three indicators, namely learning objectives, needs and problems of facilities and infrastructure.

Table 1. Context component combined analysis

Indicator	Quantitative analysis	Qualitative analysis	Conclusion
Achievement of Learning Objectives by using facilities and infrastructure	78,4%	Less than the maximum is achieved, about 60 percent, as evidenced by the theoretical learning outcomes that have increased while the practical results of students have not been fully achieved properly	The learning objectives have not been achieved properly
Facilities and Infrastructure Needs	81,17%	the need for infrastructure for the learning program of the building utility system subject in its use is very good, but the learning process has not been fulfilled. Therefore, the provision of facilities and infrastructure is very much needed to be able to carry out a good learning process	the need for infrastructure for the learning program of the building utility system subject in its use is very good, but the learning process has not been fulfilled.
Facilities and Infrastructure Problems	61,21%	In its use, it was found and there were problems, namely the limited number of facilities and infrastructure and the building narrow, not adequate in extent at the time of student practice. The practice room area is 10 x 10 meters only.	There are several problems that really need to be fixed regarding the facilities and infrastructure of the utility system learning building program
Context analysis problem conclusion	73.59 % (enough)	The context component is good enough, there needs to be improvements in terms of the availability of facilities and infrastructure so that the learning process runs optimally	The Context component is quite good and needs improvement in several indicators

B. Component input

In the component, there are four indicators, namely human resources for teachers, students, facilities and infrastructure and financing.

Table 2. Combined analysis of input components

Indicator	Quantitative analysis	Qualitative analysis	Conclusion
Human Resources (Teacher)	81,13%	Teachers have qualifications, but there is only one teacher for the utility system, the reason is that from the number of teaching hours we are still lacking 1 teacher, and for teachers the utility system is still very rare, especially with industry standard teachers,	Teachers already have the qualifications and certificates of educators, it's just that there is still a shortage of teachers in the learning process

Indicator	Quantitative analysis	Qualitative analysis	Conclusion
Student	76,2%	Students are very active but students are still focused on teacher information and the level of student motivation in participating in the learning process is very high	Students are quite active in participating in the learning process
Facilities and infrastructure	72,7%	In its use, it was found and there were problems, namely the number of building facilities and infrastructure was narrow, inadequate its area at the time of student practice and the condition of the building really needs renovation	Adequate facilities and infrastructure
Funding	72,75%	In this case, the funds for facilities and infrastructure only come from BOS funds and it is not only for the building utility system learning program but will be divided again for several other majors.	Funds are not sufficient to complete and fulfill facilities and infrastructure
Conclusion of input component analysis	75,69% (enough)	The input component in the building utility system learning program is still quite adequate and needs to be improved	The input component is still in the pretty good category

C. Process component

In the process component there are three indicators, namely the planning stage, the procurement stage and the utilization stage.

Table 3. Combined analysis of process components

Indicator	Quantitative analysis	Qualitative analysis	Conclusion
Planning Stage	68,17%	The planning stage is through proposals, to the provincial office and the APBN to be budgeted, but it has not been realized properly. There are still many obstacles, the scale of priorities is not evenly distributed..	The planning stage is in the sufficient category even though there are a few budget constraints
Procurement Stage	73%	The procurement is sufficient, but it is constrained that the allocation of funds does not meet the needs, both those that need replacement and renewal of practice tools	The procurement stage is already in the sufficient category, although there are a few budget constraints
Utilization Stage	74,88%	In its use, it is good even though it is only limited to existing facilities and infrastructure and is very in accordance with the learning process	The utilization stage is in the sufficient category, although there are a few obstacles with limited facilities and infrastructure
Conclusion of process component analysis	72,01%	The process components in the building utility system learning program are good enough but need improvement at the procurement and management stage	Process components are still in the fairly good category and need improvement

D. Product component

In the outcome component, there are indicators for evaluating results, namely increasing cognitive, psychomotor and affective competencies.

Table 4. Combined analysis of product components

Indicator	Quantitative analysis	Qualitative analysis	Conclusion
Cognitive Enhancement	71%	Students' knowledge insight increases with the use of	Cognitive improvement of students is enough

		facilities and infrastructure and their learning outcomes increase	
Psychomotor Enhancement	58%	The abilities and skills according to the talents of students, who are talented in the utility field, only reach 60 – 70 percent due to the constraints of teachers who have special skills in the sanitation department and inadequate infrastructure.	Psychological improvement of students is still in the sufficient category
Affective Enhancement	70,5%	It's been very good and there are improvements and only a few people are still undisciplined in the teaching and learning process	Student Affective Improvement is enough
Conclusion Component Analysis Results	66,5% (enough)	The outcome component in the program is quite good but there needs to be improvements in improving and improving students' psychomotor competence in the form of practical learning outcomes	The yield component is still in the sufficient category and needs improvement

E. Outcome component

In the outcome component, there are indicators for evaluating results, namely DUDI and Higher Education.

Table 5. Combined analysis of outcome components

Indicator	Quantitative Analysis	Qualitative Analysis	Conclusion
DUDI	83,5%	Works at consultants	At DUDI the absorption for graduates is good
Higher Education	63%	Many do not continue because there are several factors and one of the main factors is economic problems	In tertiary institutions, the absorption of graduates is still in the sufficient category, this is due to economic factors constrained
Conclusion of Outcame Analysis	73,25% (enough)	For DUDI graduates can immediately work while continuing to a higher level is still constrained by economic factors	The Outcam component is already in a pretty good category

IV. DISCUSSION

Context component evaluation of the building utility system learning program in terms of the objectives, needs, and problems of the learning process. The results of quantitative data analysis obtained an average TCR of 73.59% in the moderate/moderate category. This is in line with Rahmi Oktarina's research (2016) where the use of facilities and infrastructure in the learning process in evaluating this context is sufficient to support the implementation of learning.

Based on the analysis of each data, it can be concluded that: 1) the objectives of the learning program in the building utility system subject learning program are to assist the learning process 2) The need for facilities and infrastructure for the building utility system learning program subject to adapt to the number of students in the teaching and learning process 3) the problem of facilities and infrastructure for the learning program of building utility system subjects whose availability is not ready for use and hinders the learning process.

The input component for evaluating the learning program of the building utility system subject in terms of human resources for teachers, students, facilities and infrastructure, and sources of funds.

The results of quantitative data analysis obtained an average TCR of 75.69% in the moderate/moderate category. The results of the observation, obtained that the infrastructure has met the standards of Permendikbud number 34 of 2018, but the maintenance of infrastructure is still lacking. A conducive study room is very influential with students' motivation and discipline in learning, where according to Silvia Marti Veri's research (2019), it was found that there was a positive and significant relationship between learning discipline and student achievement of 11.97%. Based on the analysis of

each data, it can be concluded that 1) Teacher HR is seen from the data of the academic qualifications of teachers who are already good and in accordance with the subjects they are teaching and already have an educator certificate with the major they are taking, it's just that there is a shortage of educators which causes the learning process to be slightly constrained. 2) The interest and motivation of students in the learning program of the building utility system subject to assist the learning process. 3) The need for facilities and infrastructure for the learning program of the building utility system subject with the availability of existing facilities and infrastructure. Facilities and infrastructure are inadequate when compared to the number of students and there is still a lack of availability of facilities and infrastructure for the learning process. 4) The source of funds for facilities and infrastructure comes from BOS funds only. The need for facilities and infrastructure with funds is not comparable because these funds are not only used for subjects, building utility systems, construction and property expertise programs and are also used in other majors so that the amount of funds received is very, very limited.

Components of the evaluation process of the learning program of the building utility system subject in terms of the planning, procurement and utilization stages. The results of quantitative data analysis showed an average TCR of 72.01% in the moderate/moderate category. This is in line with Andi Ikawati's research (2018), where in the planning, procurement and utilization process it is sufficient where RKAS is the initial stage in planning the procurement of the facilities and infrastructure needed. This research is also in line with the research of Husni Hanif et al (2021), it was found that the process component has a predicate with an average of 74.13% with a sufficient category, where the indicators of monitoring, implementation and obstacles need to be optimized in each component element.

Based on the analysis of each data, it can be concluded that: 1) the planning stage is generally in the sufficient category. 2) the procurement stage is included in the sufficient category. 3) at the utilization stage it is also included in the sufficient category. Product component evaluation of the learning program of the building utility system subject in terms of cognitive enhancement, psychomotor improvement and affective improvement.

The results of quantitative data analysis obtained an average TCR of 66.5% in the moderate/moderate category. The results of Ernawati, et al (2021), revealed that; 1) there is a strong relationship between the perceptions of vocational education students on the learning outcomes of vocational students, namely 59.8%, 2) there is a strong relationship between career information and vocational education students' learning outcomes, namely 46.7% and 3) there is a strong relationship between perceptions students to vocational education and career information together on student learning outcomes which are significant at 59.9%. Based on the findings of this study, it can be concluded that students' perceptions of vocational education and career information are two important factors that have a strong influence on student learning outcomes in SMK.

Based on the analysis of each data, it can be concluded that: 1) the program of procurement and utilization of facilities and infrastructure to broaden the knowledge of students, but in general the increase in student learning outcomes. 2) procurement and utilization of learning facilities and infrastructure to improve students' abilities and skills.

Components of Outcome evaluation of the learning program of the building utility system subject in terms of DUDI and Universities. The results of quantitative data analysis obtained an average TCR of 73.25% in the sufficient/moderate category. This is in line with the research of Nurfaizah, et al (2021), that the impact arising from the implementation of the Minister of Education and Culture No. 137 of 2014 concerning the national standards of early childhood education and the implementation of the Minister of Education and Culture No. 146 of 2014 has changed from year to year for the better, and it can be seen that the regulation has been implemented but is not optimal, especially in the part of educational infrastructure. Based on the analysis of each data, it can be concluded that: 1) the program for the procurement and utilization of facilities and infrastructure for students can directly work in the business world and the industrial world. 2) procurement and utilization of facilities and infrastructure for students to be able to continue to higher education levels.

V. CONCLUSION

Based on the analysis and discussion, the evaluation research of the learning program of the building utility system subject in the construction and property engineering expertise program at SMK Negeri 2 Banda Aceh with the components of context, input, process, product, and outcome can be concluded as follows:

1. The context component has a predicate with an average TCR of 73.59% with a sufficient category. Where the indicators of learning objectives with an average TCR of 78.4% in the sufficient category, the needs indicators with an

average TCR of 81.17% in the good category and the problem indicators with an average TCR of 61.21% in the poor category so it is necessary improvements and optimizations were made in each of its component elements.

2. The input component has a predicate with an average TCR of 75.69% in the sufficient category, where in the HR indicators, teachers have an average TCR of 81.13% in a good category, students with an average TCR of 76.2% in a sufficient category and Facilities and Infrastructure with an average TCR of 72.7% in the sufficient category, and Funding with an average TCR of 72.75% in the sufficient category so that it is necessary to optimize each element of its components.
3. The process component has a predicate with an average of 72.01% with a sufficient category, where in the planning stage indicators with an average TCR of 68.17% with a sufficient category, the procurement stage with an average TCR of 73% with a sufficient category and utilization with an average TCR of 74.88% with sufficient category so that it is necessary to optimize each element of its components.
4. The product component has a predicate with an average of 66.5% in the sufficient category, where the indicators of cognitive improvement with an average TCR of 71% in the sufficient category, psychomotor improvement with an average TCR of 58% in the less category and affective improvement with the average TCR is 70.5% with sufficient category so that it needs optimization in every component element.
5. The product component has a predicate with an average of 73.25% in the sufficient category, where in the DUDI indicator with an average TCR of 83.5% in a good category, and Higher Education with an average TCR of 63% in a sufficient category, it is necessary optimization of every component element.

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