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Management Analysis and Availability of Practical Equipment at the Machining Workshop of SMK Negeri 2 Palembang

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A B S T R A C T

The background of this research departs from the problem of limited number of practical equipment, suboptimal maintenance, and budget limitations that have an impact on the smooth running of learning activities. This study aims to analyze the management and availability of practical equipment in the machining workshop of SMK Negeri 2 Palembang. The research method used is a descriptive qualitative approach with data collection techniques through observation, interviews, and documentation. The results of the study show that the management of practical equipment in the machining workshop has implemented a clear task sharing system between toolman and maintenance repair (MR) officers, so that the equipment can be used optimally. However, the amount of equipment available is not yet proportional to the number of students, so practice must be done alternately through scheduling. The conclusion of this study is that budget constraints, length of procurement process, and limited number of equipment are the main obstacles, but can be minimized through more effective usage and maintenance management strategies. This research is expected to be an input for schools in improving the effectiveness of workshop management and the provision of practical equipment to support the achievement of curriculum goals.

Keywords: *Management, Equipment Availability, Machining Workshop, Vocational School, Practice, Machining Engineering*

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INTRODUCTION

Laboratories in vocational schools have a very important role, because workshops are a distinctive facility that distinguishes vocational schools from other schools. The management of the workshop includes an arrangement and maintenance system so that it can be optimally utilized by students in supporting the quality of learning. The purpose of structuring and maintaining the workshop is so that the facilities can be used quickly, precisely, relevantly, safely, and comfortably, so as to be able to support the productivity of practical activities while forming an effective, efficient, and productive work culture. (Zuhri & Sinaga, 2024)

Management is a process that includes planning, organizing, implementing, and controlling to achieve predetermined goals. Workshop management has an important role in improving the quality of teachers and students to support the quality of learning. Quality learning will have an impact on improving the quality of graduates. In vocational education, mastery of theory and practice is indispensable to meet performance standards. Therefore, teachers play a very strategic role in managing the workshop. (Nurlaila & Mulyono, 2021)

According to Rusdiana (2018), the Education Management Information System is a combination of human resources and information technology that functions to support the decision-making process in the education sector through data selection, storage, processing, and tracing activities. Meanwhile, Zamroni (2020) explained that the Management Information System plays a role in supporting the smooth implementation of educational institutions, especially in the learning process between teachers and students to achieve educational goals. (Colarika & Zahro, 2023)

Management for an institution is not static, but can change according to needs. In a management, various kinds of improvements are needed to go in a better direction. Lembanga that is static will be abandoned because static institutions have difficulties in developing. Management improvements are almost non-existent, so the efficiency of the institution will be static as well. One of the efforts to improve management is with the continuous improvement management method.

Continuous improvement management is continuous and continuous improvement. Errors that cause waste must be corrected. Actions that cost a lot of time should be eliminated. Everything that is unnecessary and costly must be changed. The evaluation of the institution is carried out at all times, so that the institution will not repeat the mistake a second time.

Continuous improvement management will be effective if all parties are involved. All parties involved are included for discussion in deciding on a problem solving that is comprehensive and not temporary. The management of continuous improvement of a newly established institution will be able to compete with other similar institutions. Continuous improvement management always leads to better change. The main obstacle to implementing continuous improvement management is the mental factor. People who are first into continuous improvement management will feel uncomfortable. They will feel that their habits are changed abruptly. Over time they will understand about continuous improvement management on their own.

An institution or organization if in implementing the principles of sustainable improvement management slowly but surely will affect the people in the institution or organization, including students because it will become a culture to always improve themselves, not give up on existing limitations and always strive to improve existing conditions with available resources, forced to invest relatively small amounts. (Tampubolon, 2020)

Practice in vocational education has a very important role because it is a means for students to apply theoretical knowledge to real situations in the world of work. Through hands-on activities, students not only acquire technical skills, but also form the professional attitude, responsibility, and problem-solving abilities required by the industry. According to Wena (2019), practical activities help students develop work competencies in accordance with industry standards, so that vocational education graduates are better prepared and competent to face the demands of the world of work. Thus, practice is the main element in creating skilled, productive, and highly competitive graduates.

Vocational education aims to produce graduates who are ready to work according to the needs of the industrial world. SMK Negeri 2 Palembang as one of the leading vocational schools, has a Machining Engineering expertise program that requires the support of adequate practical facilities. The management of practical equipment management and its availability is an important factor in supporting student competence. This study aims to analyze the extent to which equipment management is carried out and how the condition of the availability of practical equipment in the machining workshop of SMK Negeri 2 Palembang is.

SMK Negeri 2 Palembang is one of the educational institutions in the city of Palembang. This school is a school that has received A (very good) accreditation. SMK Negeri 2 Palembang has eight workshops consisting of network computer workshops, drawing engineering workshops, mapping, electricity, mechatronics, light vehicle workshops, motorcycles and machinery workshops. The machining engineering expertise program obtained an A rating, this accreditation has been valid since 2021 with Accreditation Decree number 1347/BAN SM/SK/2021.

One of the government's policies in the field of education is as contained in Law Number 20 of 2003 concerning the National Education System, which includes the basis and objectives, the implementation of education including compulsory learning, education quality assurance and the role of the community in the national education system. The 3 policies were made to produce good Indonesian education and quality graduates in the education sector. To support this, first determine the standards that must be a reference for the implementation of educational activities, for this reason the government issued Government Regulation

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The standards that are the basis for the implementation of education as stipulated in Article 2 of Government Regulation Number 19 of 2005 (Government Regulation, 2005:4) are; (1) Content Standards; (2) Process Standards; (3) Graduate Competency Standards; (4) Standards for Educators and Education Personnel; (5) Facilities and Infrastructure Standards; (6) Management Standards; (7) Financing Standards; and (8) Educational Assessment Standards. (Schwartz, 2005)

From the above decision, one of the factors in the learning implementation process is infrastructure that must be managed properly so that the goals of education will be achieved. Management of facilities and infrastructure: (1) Planning of school workshops, (2) Procurement of school workshops, (3) Inventory of school workshops, (4) Storage of school workshops, (5) Maintenance of school workshops, (6) Use of school workshops, (7) Elimination of school workshops, and (8) Supporting and inhibiting factors in the management of school workshops. (Pratiwi et al., 2022)

SMK Negeri 2 Palembang as an educational institution will be better in managing the implementation of education which refers to efforts to increase graduates if it improves management in various aspects. One of them is Equipment and Materials Management Practice in the workshop in the Machining Engineering Expertise Program. This will have a positive impact on students and the school, to facilitate the teaching and learning process effectively and efficiently. Therefore, to achieve the teaching and learning process as expected, the management of equipment and materials needs to be managed properly.

If the management of equipment and materials of the Workshop in the Field of Machining Expertise at SMK Negeri 2 Palembang runs according to the planned goals, then it is hoped that the SMK will be able to manage the available workshops well. This is one of the aspects of infrastructure facilities listed in the 9 (nine) components of the International Standard Education Quality Assurance. This research is important because the quality of vocational education is highly dependent on the effectiveness of management and the completeness of available practice facilities. The machining workshop is the main place for students to develop technical skills according to the demands of the manufacturing industry, so that good equipment management will support the optimal learning process.

METHOD

In this study, a qualitative method with a case study approach is used. According to (Abdussamad, 2021) the qualitative method is a research approach that focuses on understanding meaning in a natural context, with the researcher as the main instrument, triangulation techniques in data collection, and inductive analysis without emphasizing generalization. This research will be carried out at the Machining Workshop of the Machining Engineering Expertise Program. It will be held in June 2025 which is located at the State Vocational High School (SMK) 2 Palembang.

The source of data for this research is the teacher and the manager of the Workshop (Toolman) of the Machining Engineering Expertise Program who is responsible for managing

the management and availability of practical equipment in the Machining Workshop, as well as active students in the Machining Engineering Expertise Program of SMK Negeri 2 Palembang.

In this study, the determination of samples was carried out by researchers both before and during the data collection process in the field, in accordance with the principle of emergent sampling. Initial identification is carried out by selecting a specific individual who is considered capable of providing relevant information. Furthermore, based on the data and insights obtained from previous informants, researchers can consider adding other samples to obtain more comprehensive data. (Collins et al., 2021b). The informants in this study are teachers and students of SMK Negeri 2 Palembang.

In this study, there are several data collection techniques used, namely, Interview, Observation and Documentation. The validity of this study is proven through the application of triangulation. According to (Abdussamad, 2021) Triangulation refers to a data collection method that integrates various techniques and available data sources. By applying triangulation, researchers not only obtain data, but also simultaneously verify the credibility of the data through comparison of results from various different techniques and information sources.

The data analysis technique in this study uses the Miles, Huberman & Saldana model. According to (Miles, B et al., 2014) the qualitative data analysis process is carried out interactively and continuously until no new information is found or the data has reached the saturation point. (Umam, 2023) The data analysis process includes three stages, namely: 1. Data Condendation; 2. Display Data (Data Display); 3. Conclusion Drawing/Verivication.

FINDINGS AND DISCUSSION

This research involves students and several teachers who are responsible for the management of the machining workshop of SMK Negeri 2 Palembang. All participants came from the Machining Engineering Expertise Program of SMK Negeri 2 Palembang. Participants in this study were coded H, A, K, R, and F. Data obtained from interviews with participants was transcribed and then imported into NVivo 12 Pro software for further processing.

The NVivo 12 Pro software has various features, one of which is Mind Map. Mind Map is a feature that can display text visually. This feature helps the researcher in mapping the flow of discussion based on the findings of the interview, as shown in figure 4.1, the Mind Map feature is used to map the flow of data analysis that will be carried out by the researcher using NVivo 12 Pro.

The second feature used in this study is Word Frequency Query, which is a feature that functions to display the words that appear most often in interview transcripts. Through analysis with this feature, a number of data is obtained which is then visualized in the form of images. The results showed that the word "Practice" was the word that appeared most often, followed by the words "Equipment", and "Workshop" in order.

Discussion

Obstacles in the Management and Provision of Practice Tools

Limited Budget

Even though the budget for the procurement of practical equipment is limited, learning activities must still run optimally through careful planning so that purchases are according to the main needs and not wasteful. In this condition, the management and maintenance of existing equipment is very important to keep it suitable for longer use. As explained by Mr. A, a teacher and maintenance officer in the Machining Engineering Expertise Program, the main obstacle to practice is the limited number of machines that are not proportional to the number of students, so they have to make alternating schedules. In addition, the procurement of new machines takes a long time because they are expensive and wait for budget availability. Therefore, the management of the use and maintenance of existing equipment is a solution so that practical learning remains effective even though the means are limited.

Complex and Time-Consuming Practical Equipment Procurement Process

The process of procuring practical equipment takes a long time because it has to go through administrative stages, adjust the budget, and consider relatively expensive prices to suit learning needs. This condition makes the procurement of tools cannot be done quickly and often hinders the smooth running of practice. According to Mr. A, ideally each student uses the machine independently, but budget limitations, workshop space, and the number of machines are obstacles, especially some of the CNC machines available are in a damaged condition. Machining majors require large costs, while school budgets are limited and divided into other majors. As a result, the fulfillment of practical equipment is constrained by budget, facilities, and the length of the procurement and maintenance process, so that the right management strategy is needed so that learning continues to run effectively even with limited facilities.

Suitability of Practice Tools with Curriculum and Number of Students

Fit with the Curriculum

The term in accordance with the curriculum means that every learning activity, both in terms of materials, methods, and the use of educational facilities and infrastructure, has been designed and implemented in accordance with the standards and provisions listed in the applicable curriculum. The curriculum itself is an official reference that contains learning objectives, competency achievements, teaching materials, implementation methods, and assessment systems that must be achieved in the educational process. In this context, the management system and availability of practical equipment at the machining workshop of SMK Negeri 2 Palembang have basically been adjusted to the curriculum standards, as explained by Mr. A as a teacher and maintenance repair officer. He said that practical activities had been carried out according to the curriculum standards, but because xxxviii Sriwijaya University had limited number of tools, their use had to be done alternately with a scheduling system so that all students still got practical opportunities. The same thing was also expressed by Mrs. H who stated that even though the practical activities were in accordance with the curriculum standards, the implementation was still constrained by the number of equipment that was not proportional to the number of students. To overcome this, the school implements rotational equipment use management so that all students can still practice according to the needs of the curriculum. Based on the results of the interview, the researcher concluded that although the workshop still faced obstacles in the limited number of equipment, it did not completely hinder the course of the practical learning process. The alternating use system accompanied by regular scheduling and good usage management allows practical activities to continue to run effectively according to curriculum standards. This shows that with proper management, limited facilities are not the main obstacle in achieving learning objectives.

The Number of Practice Tools Is Not Proportional to the Number of Students

The number of practical tools at the SMK Negeri 2 Palembang Machining Workshop is still far from enough compared to the number of students, so practice cannot be done at the same time. This condition demands the implementation of a rotating use system through regular scheduling so that all students still get the same opportunity. Although equipment limitations are a major obstacle, good usage management allows practical activities to run smoothly and learning objectives to be achieved.

Management Systems and Practice Equipment

Structured Tool Management

Structured tool management is carried out through planning, inventory recording, usage arrangements, and routine maintenance so that practical equipment can be used optimally. At SMK Negeri 2 Palembang, management is running quite well with the division of tasks between the toolman who maintains the tool and the maintenance repair (MR) officer who checks and repairs. This system ensures that the equipment is always suitable for use so that the practice continues to run smoothly, safely, and supports the achievement of learning goals.

Less Amount of Equipment

The availability of practical equipment in the workshop is still limited and not proportional to the number of students, so practice must be carried out in turn through

scheduling. This shortage is affected by damage, loss of equipment, or the initial amount that is indeed minimal, plus the new procurement process is long and expensive. Therefore, the management of the use and maintenance of existing tools is the key so that practical learning continues to run effectively even in limited facilities.

Research Findings

Based on the results of interviews and observations that have been carried out, the researcher found that budget limitations are one of the main obstacles in meeting the needs of practical equipment at the Machining workshop of SMK Negeri 2 Palembang. The limited funds have an impact on the amount of equipment available, which is currently still not proportional to the number of students participating in practical learning activities. This condition causes the implementation of practice not to be carried out simultaneously by all students, so the school implements a system of alternating use through the preparation of a structured schedule so that each student still gets the same opportunity to use the equipment.

In addition, budget limitations also result in the procurement process of new equipment taking quite a long time because it has to go through various stages of planning, submission, and approval from the school, while the relatively expensive price of machinery and machining equipment requires careful consideration so that the procurement is carried out on target and does not cause waste. Some of the available machines were even reported to have been damaged, but the repair and replacement process was hampered by the lack of allocation of maintenance funds.

Nevertheless, practical activities are still carried out in accordance with the applicable curriculum standards through the implementation of good equipment use management, including setting practice schedules in turn so that all students continue to get an even practical experience. Furthermore, the school has implemented a fairly structured equipment management system with the division of duties between toolman officers who are responsible for routine maintenance and maintenance, and maintenance repair (MR) officers who inspect and repair damaged equipment. The presence of this special personnel ensures that the equipment remains in a suitable condition and can be used optimally, so that the constraint of limited number of equipment does not completely hinder the running of practical activities.

Thus, it can be concluded that budget limitations, the length of the procurement process, and the number of equipment that is not proportional to the number of students are the main findings in this study, but these obstacles can be minimized through effective equipment use and maintenance management strategies so that practical learning activities continue to run optimally and curriculum objectives are still achieved even in limited facilities.

CONCLUSIONS

Based on the results of the research that has been conducted at the Machining workshop of SMK Negeri 2 Palembang, it can be concluded that the main obstacles in the management and provision of practical tools include budget limitations, the length of the procurement process, and the number of equipment that is not proportional to the number of students. Budget constraints cause the number of machines and practice equipment available to be very limited and unable to accommodate all students at the same time. In addition, the process of procuring new equipment takes a long time because it must go through the stages of planning, submission, and approval from the school, while the relatively expensive price of machining machines requires careful planning so that procurement is carried out appropriately and does not cause waste. This condition is exacerbated by the existence of several equipment that has been damaged and constrained in the repair process due to the lack of allocation of maintenance funds. Nevertheless, the school still strives to ensure that practical activities run according to the curriculum through the implementation of structured use and maintenance management. A practice scheduling system is implemented in turn so that each student gets the same opportunity to use the equipment, as well as the division of tasks between toolman and maintenance repair (MR) officers to maintain and repair equipment regularly. With good management, the constraints of limited facilities can be

minimized so that practical learning activities can still run effectively, evenly, and in harmony with the curriculum objectives. Thus, the right management strategy is the main key in maintaining the smooth running of practical activities even in limited facilities. The results of this study show that efficient management of practical equipment can be an effective solution in dealing with limited resources. Therefore, other vocational schools can use the management model at SMK Negeri 2 Palembang as a reference in developing strategies for the use, maintenance, and procurement of practical equipment in a planned manner. In addition, the results of this research can be the basis for schools and local governments in formulating budget allocation policies that are more targeted to support practice-based learning.

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