

# **Job Sheet Implementation as a Resource Mechanical Engineering Practice Learning at SMK Muhammadiyah 1 Sukoharjo**

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## ABSTRACT

This study aims to (1) analyze the use of job sheets as a source of practical learning in the Mechanical Engineering department, (2) identify constraints to using job sheets as a source of practical learning, (3) assess the extent to which job sheets increase student independence in practical learning, and (4) evaluate the improvement in students' skills resulting from using job sheets.

This research is a qualitative study using a case study model. The study was conducted at SMK Muhammadiyah 1 Sukoharjo, with teacher and student respondents. Data was collected through interviews and analyzed using Miles and Hubberman's model analysis, which involves four steps: (1) data collection, (2) data reduction, (3) data presentation, and (4) drawing conclusions.

The study results include an analysis of the use of job sheets as a learning resource, such as the job sheet making process, job sheet definitions, and job sheet implementation within the school curriculum. Constraints to using job sheets during practice were identified, such as the availability of facilities and infrastructure, students' knowledge of machines and equipment, reading and using measuring instruments, and damaged or erroneous machines or job sheets. The study also found an increase in student independence when using job sheets, including improved self-confidence, responsibility, high motivation, and reduced dependence on others.

Finally, the study found an improvement in students' skills resulting from using job sheets, including increased knowledge and mastery of machines.

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## **Introduction**

The vocational learning process includes students' basic skills that are adapted to the conditions of the world of work (Endang et al., 2014). The learning process is closely related to student learning outcomes (Sudjana, 2009). Learning is a process that must be passed, and achievement is the result of the learning process. Learning achievement is an indicator used to measure the abilities, knowledge, and skills of students (Hamalik, 2008). Improving student achievement requires that components supporting the success of the learning process synergize with each other. The success of a learning process can be influenced by the methods used by educators (Rusman, 2009).

In SMK, the emphasis is more on practice, particularly for productive learning (Sudjana, 2009). Learning activities, especially practices at Muhammadiyah 1 Sukoharjo Vocational School, use the lecture method, which explains equipment material, work steps, work safety, and machine operation as well as providing demonstrations directly in front of students. During practical learning, students are more enthusiastic about implementing it immediately. However, students' knowledge about using machines and their equipment is still lacking, so there is a need for learning media to guide students' practical activities. The lack of knowledge among students about how to use machines and equipment results in unsatisfactory practical results. As a result, many students' practical learning value remains below the Minimum Completeness Criteria (KKM).

The use of job sheets is one of the media used as a source of practical learning at SMK Muhammadiyah 1 Sukoharjo. The use of job sheets during practice is considered sufficient to help students complete assignments. However, there are still some educators and students who have not used job sheets as learning media for various reasons. The definition of a "job sheet" is a sheet of paper containing work drawings, work steps, equipment used, and occupational health and safety (Triarto, 2009). Practical learning using job sheets trains students to be competent. This is consistent with research from Azizah and Rusimamto (2019), which found that students' competence increased significantly after receiving learning through the use of job sheets.

Practical learning basically develops the competence of students, which in this case is independence. Andayani (2019) defines people who are independent as being able to make decisions and be creative and confident. In learning the practice of turning, there are some students

who are still not confident in using a lathe and its equipment. Students still often wait for the teacher's instructions to carry out practical activities, even though the teacher has given examples of how to use a lathe and its equipment. Students need assistance from the teacher in order to develop a sense of self-confidence and a sense of independence. Steinberg writes in N. Nasution, Rahayu, Yazid, and Amalia (2018) that there are three aspects of independence, namely: (1) emotional independence, (2) behavioral independence, and (3) value independence.

Based on the explanation above, it can be concluded that practical learning requires media that supports the performance of students in completing their work. Practical learning, apart from training their hard skills, also trains their soft skills. The use of job sheets in this study focuses on training independence and improving students' skills.

### **Method**

This study uses a qualitative method with a case study model and data collection techniques in the form of interviews and evaluation sheets. The subjects of this study were students in class XI, with a total of 28 children and several teachers. The research location is SMK Muhammadiyah 1, Sukoharjo, with a concentration in mechanical engineering expertise. The data analysis technique used for this research is Miles and Hubberman's data analysis technique. In this study, data examination used a triangulation technique.

### **Result and Discussion**

Based on the description above, it can be concluded that there are several things that are important and need to be discussed. Namely, as follows:

#### **Use of job sheets as a source of practical learning**

Based on the research results, several aspects of making job sheets as a source of practical learning can be summarized, including: (a) curriculum, (b) job sheet making grid, (c) definition of job sheets, and (d) implementation of using job sheets.

The results of the study reveal that the use of job sheets as a source of practical learning is expected to help students achieve the desired competencies. Making job sheets refers to basic competencies taken from the curriculum used by schools. Because by using the basic competencies of the material on the job sheet in accordance with the wishes of the school, The development of job sheets includes not only subjects and learning processes, but also student development and character formation. The results of the study show conformity with Achruh's research (2019) that the curriculum has an important role in education, namely to achieve effective and efficient learning.

The grids used in making job sheets are used to make it easier to make learning media. Job-sheet media is used as a learning resource that makes it easier for students to practice. The results of the research show compatibility with research from Permani and Hambali (2022) that job sheets must

be valid, effective, and practical to use for practical learning.

Worksheets or job sheets are guidelines used by students for practice. The job sheet contains work drawings, equipment used, materials, work steps, and so on. The results of the study show conformity with Manalu's research (2021) that job sheets are work instructions that contain tools and work drawings that support a particular job.

The use of job sheets is implemented in all practical subjects. Because using job sheets when practicing can help students complete their assignments independently and master the equipment used. The research findings are consistent with Marniati's (2021) findings that the benefits of job sheets can aid students' learning processes in independent learning and practical learning.

### **Obstacles to using job sheets as a source of practical learning**

The use of job sheets as a source of practical learning has several obstacles, which are as follows: (a) facilities and infrastructure; (b) students' knowledge of machines and equipment; (c) using machines; (d) reading and using measuring instruments; (e) the machine is damaged or has an error; (f) the worksheet is missing or damaged.

The use of job sheets has several obstacles, one of which is the lack of facilities and infrastructure. The lack of complete facilities and infrastructure resulted in the learning process being disrupted, resulting in a decrease in student practice results. The results of this study are in accordance with research from Alfaruq, Achmad, and Mahendra (2020), which states that workshop facilities and infrastructure affect student learning outcomes.

Students' knowledge of machines and equipment will provide information on their functions and how to use them. This can reduce errors and even work accidents due to the students' lack of knowledge. Student knowledge will also affect competence, especially practice. The results of the study show compatibility with research from Kardo, Wilujeng, and Suryaningtyas (2020), who concluded that knowledge management has a positive and significant role in their performance when carrying out activities.

Knowledge of lathe operation must be mastered by students. If students do not master the knowledge of operating lathes, then they will have difficulty practicing lathe operations. The results of the study show compatibility with research from Sukmana, Sugiyanto, and Eka Risano (2020) that students' knowledge of the equipment used will affect performance when carrying out practical activities.

To support student performance in putting theory into practice, students must also understand how to use and read measuring instruments. Because the main function of the measuring tool in this practice is to find out the size of an object that is being turned or has been turned, The results of the study show conformity with research from Mufarrih, Harijono, Qosim, and Gumono (2022), which

revealed that increasing students' abilities and knowledge of using measuring instruments will affect their abilities while studying or working.

The lathe is the main component in the concentration of machining engineering expertise. If there is no machine ready for practical use, then students learn only theory. Even though students need practice to prove the theory they have learned, The results of the study show compatibility with research from Tawaqal (2020), which concludes that there is a positive influence between lathe training and student competence.

Worksheets or job sheets are given to all students at the beginning of practical learning. But in fact, the job sheets are often lost or damaged before students finish their work. Because of this, learning lathe machine practice became less effective. The results of the research show conformity with research from Yunarsah (2022), which shows that applying job sheets during practice will improve students' practical learning outcomes.

#### **The use of job sheets can increase the independence of students.**

The use of job sheets can affect the independence of students, as can be seen from their behavior during practice. The following are some indicators of independent students: (a) confident; (b) responsible; (c) highly motivated; (d) not dependent on other people.

Confidence is the ability of students to develop themselves after being given practical material by the teacher. Students must be confident in their ability to operate a lathe. The results of this research show that it is in accordance with research from Fransisca, Wulan, and Supena (2020), which concluded that a child who has high self-confidence will have a sense of optimism in achieving something he wants.

Responsibility is a trait that needs to be instilled in all students. One must be accountable to oneself, others, machines, and the environment. Each learner's sense of responsibility is different, from good to bad. Therefore, it is necessary to have assistance and examples from teachers and other parties so that students can foster a sense of responsibility. The results of the study show compatibility with research from Sari and Bermuli (2021), who concluded that an attitude of responsibility is part of character education that must be developed in each individual.

When the motivational lathe practice is carried out so that students complete the work on time and in accordance with the working drawings, Motivating students is tricky; when students are happy, they are easy to motivate, but when students are not good, it is difficult to motivate. Therefore, the teacher never stops motivating students to be enthusiastic about practical learning. The results of the study show compatibility with research from Juliansyah and Widodo (2021), concluding that motivation has a positive impact on students' long-term learning achievements.

The attitude of students who are not dependent on other people will foster self-confidence and

increase their independence. With independence, students are more optimally able to develop their abilities. The results of the study show compatibility with research from Riyanti (2021), which concluded that independence in learning is one of the internal factors that can influence the level of learning outcomes.

### **The use of job sheets can improve students' skills.**

Using job sheets when practicing is expected to train students' skills. The following are some indicators of skilled students: (a) knowledge; (b) mastery of machines.

Skilled learners have broad understanding and knowledge. This knowledge is used to make it easier when practicing. The results of the research show compatibility with research from Nurbianto, Septimar, and Winarni (2021), who concluded that there is a significant relationship between knowledge and skills.

The skills of students can also be seen in the way they operate equipment or machines. Students understand the functions and uses of these parts. so that they operate quickly and don't hesitate. The study's findings are consistent with the findings of A. T. Nasution (2019), who discovered that the ability to operate machines can improve with practice.

### **Conclusion**

Based on the results of the research and discussion in the previous chapters, the following conclusions can be drawn:

1. The use of job sheets in the concentration of mechanical engineering expertise provides benefits for both teachers and students. Because the job sheet provides convenience in the learning process, especially practice, making job sheets as a learning resource has criteria including: (a) curriculum, (b) making grids, (c) definition of job sheets, and (d) implementation of use.
2. The use of job sheets when practicing in the concentration of mechanical engineering expertise has several obstacles. These constraints come from the students and the equipment used. These obstacles include: (a) facilities and infrastructure; (b) students' knowledge of machines and equipment; (c) using machines; (d) reading and using measuring instruments; (e) machines that are damaged or have errors; and (f) the job sheet that is missing or damaged.
3. The use of job sheets, apart from being a reference for practice, can also improve competency, namely in the form of student independence. This is evident in their practice behavior, which includes: a) confidence, b) responsibility, c) high motivation, and d) independence from others.
4. The use of job sheets, apart from being a reference for practice, can also improve competency, namely in the form of student skills. This can be seen during practice, namely: (a) students have knowledge of lathes; (b) students are skilled in using lathes.

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