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Utilizing of job sheet as learning media to improve student learning outcomes in basic skills practicum

Abstract

Student enthusiasm is the most important factor in the learning process's success. As a result, for a more efficient learning process that can enhance student learning outcomes, more interaction is required. Job sheets were used as a learning tool for students in this study, and the learning outcomes and their application were investigated. This study employed classroom action research as a qualitative method. Twenty students from class X TP A served as the study's subjects. The instruments of this study were project observation sheets at the psychomotor level, multiple-choice test questions for cognitive aspects, and observation sheets for students' affective learning outcomes. The consequences of perceptions of understudy learning results in each cycle are shown; The aftereffects of the concentrate in the main cycle arrived at a normal of 66, and the consequences of the concentrate in the subsequent cycle arrived at a normal of 79. In the first cycle, the classical completion rate was 50%, and in the second cycle, it increased to 95%. KKM 70 and a classical completion rate of at least 70% are signs that the research results that have been set are successful. According to the findings of this study, including Job Sheet learning materials in the Basics of Mechanical Engineering course can help students improve their learning outcomes.

Keywords : Learning Process, Job Sheet, Learning Outcomes, Fundamentals of Mechanical Engineering

Introduction

A carefully planned approach to improving the welfare of society and the intellectual life of the nation is used to improve education, i.e. the quality of human resources. 'The motivation behind training is essentially to bring learners towards changes in behaviour, both scientific, moral, and social' (Law of the Republic of Indonesia No. 20 Year 2003 on the Public School System, 2003). To achieve educational goals, the teaching and learning process is very important, and a person's learning process determines his or her learning outcomes. It is essential to design a creative and effective learning environment in which teachers and students can participate to create an interesting and enjoyable learning environment. One of the standard measures of education quality is measurable learning outcomes. The learning process develops students' knowledge and skills. The goal of vocational high schools (SMK) is to become a state investment that has the ability to produce high-quality human resources in accordance with their fields. In order to become a qualified workforce, vocational school graduates must have the following skills and competencies: productive, creative, innovative, affective, and skilled to contribute to social life.

The results of observations carried out at SMK Dhuafa Padang, this school applies the Merdeka Curriculum in the teaching and learning process. The skills that underlie the mastery of fitting and

machining are taught in the Fundamentals of Mechanical Engineering subject, so students must understand them better. Students will improve their understanding of the basics of mechanical engineering if the right learning model is chosen for them. According to the author's observation during the educational field practice at SMK Dhuafa Padang, students are passive learners because the learning media in the classroom applied by the teacher is not varied. Everything that is used to convey messages to students in order to attract interest in learning and create a conducive learning environment is called learning media. In addition, the main purpose of learning materials is to help students understand the true meaning of the material being discussed. As a result, students only passively accept what the teacher has conveyed, which has an impact on the proportion of student learning completeness that does not reach the KKM limit set. Students are expected to get a score greater than the limit of learning completeness in learning the Basics of Mechanical Engineering, which is 70 for productive values assessed by the school.

The results of the problem analysis above show that media that can improve mastery of bench work materials are needed to support students' understanding of the theory and basic practice of mechanical engineering. Concluding that the learning outcomes of PLC courses can be improved through the use of job sheet media. To overcome the problems mentioned above, the learning process of Fundamentals of Mechanical Engineering must be improved continuously. To improve students' thinking, learning outcomes, and creativity, a more appropriate learning model is needed. Because teachers are more aware that creating a quality educational process can only be achieved through improving the learning process in accordance with the needs of the subject. Thus, the bench work Job Sheet, which contains instructions on bench work practice materials, can be used by students both in groups and individually. As stated earlier, student-centred learning methods meet the needs of students. Therefore, choosing project-based learning is the right choice. This is where the project-based teaching and learning paradigm succeeds.

Methods

Classroom Action Research (CAR) is one of the studies that shows the flow and achievements of CAR conducted in the classroom to improve the quality of learning. PTK will be carried out by using Job Sheet as a practice material for bench work material. By using Job Sheet at SMK Dhuafa Padang, it is expected that students' basic mechanical engineering learning will improve. A total of 20 students of the Mechanical Engineering study programme of SMK Dhuafa Padang, class X TP A in the Basics of Mechanical Engineering course were used as research subjects.

The implementation of the predetermined design, namely the Job Sheet learning media, is carried out through doing something in action. The inner workings of a classroom action study involve four steps: preparation, taking action and then observation and reflection. The PTK was conducted in several cycles, with each cycle involving a minimum of two learning sessions. The study was conducted by the researcher with two cycles, through two meetings in each cycle.

The purpose of data collection is to collect various information to objectively solve the topic under study. A 30-item multiple choice exam, an attitude assessment sheet, and a project assessment in each cycle were the means of accumulating data used in this study. The exam serves as a measurement tool for learning completeness while using the project-based learning paradigm. Photographic documentation was very helpful in supporting data collection. Before starting the research in class X TP A, the researcher utilised the opportunity to test the instruments that would be used in the research. Testing the research instrument resulted in calculus to evaluate the validity, reliability, difficulty level, and discriminative power of the instrument. An instrument is a device that collects information to facilitate a task.

The purpose of the learning process is known as learning outcomes. If all requirements have been met, the learning objectives are considered to have been met. The test results set at the end of each cycle with a KKM of 70 are used to assess student learning completeness.

Table 1. Learning Completeness Interval Categories

| No | Interval | Category |
|----|----------|----------|
| 1. | 86%-100% | VG |
| 2. | 76%-85% | G |
| 3. | 60%-75% | S |
| 4. | ≤59% | L |

Table 2. Lists the requirements and intervals that students must meet to fulfil the learning objectives. The researcher set the percentage of students' classical completion above 70%, indicating that they were classified as S (Sufficient).

Result and discussion

Result

Cycle 1

Using a project-based learning paradigm, the learning process in the classroom in cycle 1 proceeded quite smoothly in accordance with the stages of PTK as follows: 1. Planning, Planning a lesson plan, or flow of learning objectives, is what is done in the planning stage (ATP). 2. Implementation and Observation, carried out aims to conduct project research on each group of students using project task observation sheets and ensure the course of the Job Sheet Learning Media stages. 3. Observation, The learning process in the first cycle went quite well by using the Job Sheet learning model. 4. Analysis and Reflection, Students have not used learning resources, so they still make mistakes when working on projects. The results show that the most appropriate step to take when starting the next cycle is that the teacher gives each group the opportunity to discuss with other groups, so that discussion between groups can be established, this is an effort to overcome the problem of groups that get low scores. The second meeting evaluated the learning process. Multiple choice questions were used to calculate the students' learning completeness in the knowledge domain, while project assignments were used for skills, and observation sheets were used to measure learning values in the attitude domain. Before the research, the questions were written, and the teacher made adjustments until the questions could be used in testing student learning completeness. Product drawings were used in the students' project assignments.

Table 2. Showing data regarding learning outcomes of cycle 1

Table 2. Learning outcomes of cycle 1

| Learning Outcomes | Score | | | |
|------------------------------|----------|-----------|--------|-------------|
| | Attitude | Knowledge | Skills | Final Score |
| highest score | 80 | 77 | 76 | 74 |
| lowest score | 62 | 33 | 63 | 61 |
| average | 72 | 66 | 70 | 69 |
| number of students completed | | | | 10 |
| classical completeness | | | | 50% |

It is clear from the table that the class learning goal of 74 was the highest final score, and 61 was the lowest. There are ten students who are complete. Students are still unable to answer test questions with 50% classical completeness, so the next cycle needs to see progress in that area.

Cycle 2

Using project-based learning methodology, the learning process of cycle 2 went smoothly, which was still the same stages as cycle 1, but cycle 2 was carried out after being given a reflection of cycle 1. Project tasks were used to measure skill completeness, while questions were used to measure knowledge completeness. The observation sheet was used to evaluate attitude

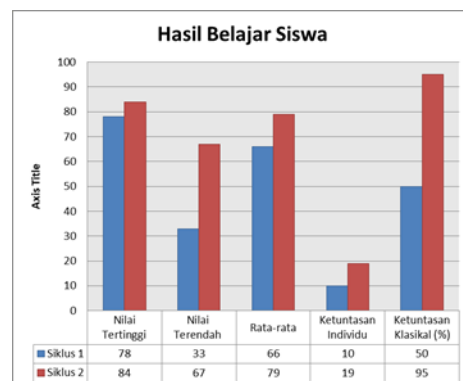
(affective). Before the research was conducted, the questions were written, and the teacher made adjustments until the questions were said to be feasible in measuring the completeness of student learning outcomes. Data on learning completeness can be seen in Table 3 below.

Table 3. Learning outcomes of cycle 2

| Learning Outcomes | Score | | | |
|------------------------------|----------|-----------|--------|-------------|
| | Attitude | Knowledge | Skills | Final Score |
| highest score | 82 | 90 | 85 | 84 |
| lowest score | 70 | 67 | 63 | 70 |
| average | 78.4 | 79 | 78 | 79 |
| number of students completed | | | | 19 |
| classical completeness | | | | 95% |

Table 3. Explaining the class learning results, the highest score was 84 while the lowest score was 70. There were 19 complete learners, resulting in a percentage of classical completeness of 95%. The research success indicator was achieved if the proportion of classical completeness on student learning scores was 70%. As a result, the PTK with the project-based learning process model was stopped at cycle 2. The research shows that the project-based learning process approach can improve students' educational completeness in the Fundamentals of Mechanical Engineering class. The increase in affective, cognitive, and psychomotor learning scores was shown by students in cycle 1 and 2.

Discussion



Picture 1. Improvement in learning outcomes for each cycle

Figure 1 proves that in cycle 1 there were 10 students considered complete with an average learning completeness of 60. In contrast, in cycle II there were 19 students whose overall score had an average student learning completeness of 79. The project-based learning approach was successfully implemented, The success of the second cycle research action was evidenced by the qualified student learning outcomes, Project-based instruction is a type of learning utilising activities or projects to help students acquire knowledge, psychomotor skills, and attitudinal skills. Ibn Abid Al Rashid's Final Project provides significant research to support the idea that a project-based teaching and learning paradigm can improve student learning success.

Conclusion

Students' learning completeness can be improved by applying a learning process based on project assignments to carry out learning in the Fundamentals of Mechanical Engineering subject. Based on the learning completeness in cycle 1 with a value of 66, that the value of students is considered complete as many as 10 people and 50% classical completeness, it

becomes the basis. The average student learning completeness increased even greater to 79 in cycle II, with a classical completeness of 95%, meaning that there were 19 students who were considered complete. So, the application of learning media in the form of Job Sheet can be said to be successful and beneficial for the learning achievements of X TP A class students.

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Declaration

Author contribution

Muhammad Siddiq as a researcher and data collector for the facility relationship. Prof. Ir. Syahril, M.Sc., Ph.D. is a provider of direction and methods in research; Dr. Dori Yuvenda, S.Pd., M.T. Evaluating research methods and data analysis and evaluating Background of the Problem.

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Conflict interest

The author states that there was no conflict when conducting the research.

References

- Y. R. Anggarta and T. Sukardi, "Pengembangan Job Sheet Sebagai Sumber Belajar Praktik Teknik Pengukuran Kelas X Teknik Pemesinan Di Smk," *J. Pendidik. Vokasional Tek. Mesin*, vol. 4, no. 2, pp. 97–104, 2016.
- Undang Undang Republik Indonesia nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional, "Analisis struktural kovarians pada indikator yang berhubungan dengan kesehatan di antara para lansia di rumah, dengan fokus pada perasaan subjektif tentang kesehatan. Title," *Demogr. Res.*, vol. 49, no. 0, pp. 1-33 : 29 pag texts + end notes, appendix, referen, 2003.
- I. Lestari, "Pengaruh waktu belajar dan minat belajar terhadap hasil belajar matematika," vol. 3, no. 2, pp. 115–125.
- A. Ardana, D. Surani, and B. Sri Kurniawan, "Pemanfaatan Macromedia Flash 8 Sebagai Media Pembelajaran Untuk Meningkatkan Hasil Belajar Siswa Pada Mata Pelajaran Informatika Kelas X Di SMA," *JATI (Jurnal Mhs. Tek. Inform.)*, vol. 8, no. 2, pp. 2435–2439, 2024, doi: 10.36040/jati.v8i2.9612.
- A. Nurhasanah, S. Subekti, and R. Patriasih, "Analisis Penggunaan Jobsheet Pada Praktikum Dasar Boga Di SMKN 9 Bandung," *Media Pendidikan, Gizi, dan Kuliner*, vol. 6, no. 2, pp. 1–8, 2017.
- H. Pusparani and M. Pd, "Media Quizizz sebagai Aplikasi Evaluasi Pembelajaran Kelas VI Di SDN Guntur Kota Cirebon," vol. 2, pp. 269–279, 2020.
- P. B. Alam, "3) 1,2,3," vol. 3, no. 7, pp. 6967–6974, 2022.
- W. A. R. Rosalina and P. Sitorus, "Pengembangan Trainer Pengaturan Motor Listrik Terprogram Pada Mata Pelajaran Instalasi Motor Listrik," *JEVTE J. Electr. Vocat. Teach. Educ.*, vol. 2, no. 1, p. 1, 2022, doi: 10.24114/jevte.v2i1.35879.
- N. Jalinus, K. Arwizet, and R. A. Nabawi, "Improve Learning Outcomes of Students Through Implementation of The Collaborative Project-Based Learning Model in Thermodynamics," no. October, pp. 559–564, 2017.
- I. Machali, "Bagaimana Melakukan Penelitian Tindakan Kelas Bagi Guru ?," vol. 1, no. 2, 2022.
- R. N. Fajri, S. Syahril, and P. Purwantono, "Meningkatkan Hasil Belajar Siswa di Mata Studi Gambar Teknik Manufaktur Kelas XI TP 1 SMK N 1 Sumatera Barat bersamaan Penerapan Model Pembelajaran Berbasis Proyek," *J. Vokasi Mek.*, vol. 4, no. 4, pp. 90–97, 2022, doi: 10.24036/vomek.v4i4.464.

- Arikunto, S. (2016). *Prosedur Penelitian: Suatu Pendekatan Praktik*. Rineka Cipta.
- Al Rasyid, I. A., Aziz, A., Purwantono, P., & Indrawan, E. (2020). Penerapan Model Pembelajaran Project Based Learning untuk Meningkatkan Hasil Belajar siswa Kelas XI pada Mata Pelajaran Teknik Frais di SMK Negeri 1 Tanjung Raya. *Jurnal Vokasi Mekanika*, 2(4), 154-158.
- Ridwan. (2024). Analisis Kesulitan Belajar Praktik Kelistrikan Otomotif Siswa Jurusan Teknik Kendaraan Ringan SMK Latanro Enrekang.
- Saleh, M. Idris, & Yanti, H. (2021). *Epidemiologi K3*. Deepublish.
https://www.google.co.id/books/edition/Epidemiologi_K3/BI4mEAAQBAJ?hl=id&gbpv=1&dq=sugiyono+sampel+30-500&pg=PA110&printsec=frontcover