The demonstration method using kinesthetic learning style on oxy-acetylene welding practice

R D Djatmiko, F N Pradana, T A Prasetya and A G S Putra
Department of Mechanical Engineering Education, Universitas Negeri Yogyakarta, Indonesia

E-mail: riswan_dd@uny.ac.id

Abstract. This study aims to determine the differences between students' learning outcomes using kinesthetic learning demonstration learning method on the oxy-acetylene welding practice subject for welding technique class grade X students at Sayegan 1 Vocational High School. The research method used was an experimental method with quasi-experimental design research as the research type. The results showed differences between the learning outcomes of welding technique class grade X students between before they were given the treatment and after, using the kinesthetic learning style demonstration method. It could be seen in the results of the assessment: the average post-test scores in the two classes are the highest on the aspect of the assessment criteria number 2 for the experimental and control groups with a value of 0.4. The lowest is in criterion number 8, with a value of 0.25 for the experimental group. For the control group, the lowest is on criterion number 4, with a value of 0.11. This was proved by the increase of the average score on assessment criteria before and after the treatment. Thus, the demonstration method's effect using kinesthetic learning style on oxy-acetylene welding practices of welding technique class grade X students at Sayegan 1 Vocational High School.

1. Introduction
Learning is a unit of activity carried out consciously by a person and causes changes in his / her form based on sensory experiences [1]. Learning styles show how a student learns and can be a reference for a teacher to teach successfully [2]. Learning style influences how students learn, how teachers teach, and how they interact [3]. The importance of evaluating student learning styles and developing learning methods that teach specific learning styles has received considerable support in education[4]. Understanding student learning styles can help teachers plan and implement learning to follow student desires [5].

Learning styles are broadly defined as beliefs, habits, and preferences that affect how an individual prefers how the material is presented (visual, auditory, or kinesthetic) [6]. Kinesthetic learning style is a combination of absorbing, managing, and processing information learned by moving, working, and moving [7]. Students who have a kinesthetic learning style will learn better when doing experiments and are physically involved [8]. The application of demonstration learning methods with a kinesthetic style is also a new challenge for a teacher. The existence of a demonstration method with a kinesthetic learning style, it is hoped that the material taught can quickly achieve the learning objectives because the demonstration method with a kinesthetic learning style can strengthen understanding of the material more clearly will be easily remembered by students.

Students' active involvement during learning affects student learning outcomes [9]. Increasing learning outcomes can be achieved by paying attention to several aspects, both internal and external. External aspects include how the learning environment is prepared and facilities are empowered, while the internal aspect includes aspects of child development and individual personal uniqueness [10].

The not yet optimal implementation of practical learning at Sayegan 1 Vocational High School can be seen from the low learning outcomes of oxy-acetylene welding subjects. The causes of low student...
learning achievement, namely: students experience confusion in doing the job given. Field observations show that sometimes teachers do not directly practice how to complete a job correctly. The learning methods that are usually applied by teachers are still teacher-centered. Teacher-centered learning tends to minimize student involvement in the learning process so that students become passive. The habit of being passive in the learning process can affect students so that students are afraid and embarrassed to ask the teacher about material that is not understood.

Practical learning is a learning process by providing students with opportunities to implement all the classroom theories by facing work objects directly [11]. Practical learning has an essential role in developing students’ skills as work [12]. One of the learning methods for practice that requires all students' activeness is a demonstration method with a kinesthetic learning style. In oxy-acetylene welding, learning is needed by practicing or giving examples by guiding students directly, such as in the demonstration learning method with a kinesthetic learning style.

The demonstration method refers to a teaching method where the teacher provides an example while students watch intending to imitate what the teacher teaches [13]. The demonstration method’s purpose is that students can imitate what is exemplified by the teacher [14]. The demonstration method is one way to increase success in the learning process of the practice of oxy acetylene welding. The purpose of using the demonstration method with a kinesthetic learning style is to practice or give examples by guiding students directly to the process of the material being taught, and it is easy for students to understand.

This study aims to determine whether there is an effect of the demonstration method with the kinesthetic learning style on the welding practice of Oxy-Acetylene Welding students of class X Welding Engineering I Vocational High School.

2. Method

2.1. Research design
This research refers to a quantitative research approach. The type of research used is quasi-experimental design research because the researcher in this study cannot control external variables.

2.2. Data collection techniques
The data collection technique used to collect students' data was the pre-test and the final test on the control group and the experimental group. The control group practical learning used the demonstration method, while the experimental group learning used the demonstration method with a kinesthetic learning style. Aspect criteria for welding results can be seen in table 1.

| Table 1. Aspect of welding result assessment |
|---------------------------------------------|
| Aspect | Aspect Of Criterion-Description |
|-------|----------------------------------|
| 1     | Has surface slag, smoke and spatter been removed from 99% of the joint and surrounding area? |
| 2     | Are stray arc strikes absent? |
| 3     | Is the bead width uniform and regular? (Allow 2mm variation) Are all stop starts smooth on the capping layer? Allow 1.5mm variation between the stop and restart |
| 4     | Is the weld metal completely free from visual inclusions? (Slag, Tungsten, etc) One defect = 0.2 marks, 2 defects = 0.1 marks, 3 or more defects = 0 mark (1 visual inclusion = 1 defect) |
| 5     | Is the weld metal completely free from surface porosity? One defect = 0.2 marks, 2 defects = 0.1 marks, 3 or more defects = 0 mark (1 visual inclusion = 1 defect) |
| 6     | Is the welded joint free from undercut? (disregard depth of 0.5mm or less) One defect = 0.2 marks, 2 defects = 0.1 marks, 3 or more defects = 0 mark |
2.3. Analysis techniques
The data analysis technique used in this research is descriptive analysis. The data obtained in this study were described according to each variable. The study only explains one variable, namely learning outcomes, which are then broken down into variables before treatment and variables after treatment.

3. Results and Discussion

3.1. Learning outcomes before treatment
The analysis of the learning outcomes of the control group's Oxy-Acetylene Welding practice obtained a mean score of 29.17, median 28, mode 25, and a standard deviation of 7.58. The highest score was 53, and the lowest score was 22. The results are illustrated in figure 1.

![Figure 1. Bar graph of control group value before treatment](image)

The learning outcomes of the Oxy-Acetylene Welding practice in the control group before being treated had the highest average value on the aspect of criterion number 2 with a value of 0.4, and the lowest was in criterion number 5 with a value of 0.01. The results are depicted in figure 2.

![Figure 2. Graph of mean value of aspect criteria from control group](image)

The experimental group's analysis of learning outcomes obtained a mean 33.73, a median of 33, a mode of 33, and a standard deviation of 8.47. The highest score is 50, and the lowest score is 22. The results are illustrated in figure 3.
The learning outcomes of the experimental group before being given treatment can be seen in Figure 4. The highest average value is in the aspect of criterion No. 2, with a value of 0.4. The lowest average value is in criterion number 4, with a value of 0.05. The results are illustrated in figure 4.

3.2. Learning outcomes after treatment

The control group learning outcomes analysis obtained a mean 59.06, a median of 58, a mode of 58, and a standard deviation of 9.68. The highest score was 81, and the lowest score was 44. The results are illustrated in figure 5. The learning outcomes of the control group after being given treatment can be seen in Figure 6.
The experimental group learning outcomes analysis obtained a mean of 77.23, a median of 75, a mode of 75, and a standard deviation of 9.79 with the highest score being 94 and the lowest score being 61. The results are illustrated in figure 7.

After being given the treatment, the experimental group's learning outcomes obtained the highest average score for the criterion aspect number 2 with a value of 0.4. The average value of the lowest criterion aspect is criterion No. 8, with a value of 0.25. The results are illustrated in figure 8.

The experimental group's learning outcomes and the control group after being given treatment can be seen in table 2. Based on table 2, there is the highest average value on the aspect of criterion number 2 for the experimental group and the control group with a value of 0.4. The lowest average value is in criterion No. 8, with a value of 0.25 for the experimental group. Whereas for the control group, the lowest average score was the criterion aspect no 4 with a value of 0.11. Based on the results of the analysis, it can be seen that the demonstration method of kinesthetic learning styles is learning that is oriented towards the learning success of its students and is very useful for learning welding practices.
Table 2. Aspect Criteria-Description Posttest

| No | Experimental group | Control group |
|----|---------------------|---------------|
| 1  | 0.3                 | 0.17          |
| 2  | 0.4                 | 0.4           |
| 3  | 0.28                | 0.21          |
| 4  | 0.27                | 0.11          |
| 5  | 0.36                | 0.21          |
| 6  | 0.31                | 0.28          |
| 7  | 0.33                | 0.27          |
| 8  | 0.25                | 0.24          |
| 9  | 0.28                | 0.24          |

4. Conclusion

Based on the results of the study's analysis, it was concluded that there were differences in the learning outcomes of the Oxy-Acetylene Welding practice subjects between the class treated with the kinesthetic learning style demonstration method and the class that was not treated with the kinesthetic learning style demonstration method. The average value of learning outcomes in practical subjects of Oxy-Acetylene Welding was higher with the kinesthetic learning style demonstration method.

Applying the demonstration method of kinesthetic learning styles will make it easier for students to understand the material and improve skills. Therefore, as a subject in the learning process, the teacher must be creative in presenting learning material. The delivery of exciting subject matter will arouse students' enthusiasm for learning.

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