

EFFECTIVENESS OF USING DRILL METHOD ON STUDENTS LEARNING OUTCOMES

Nurhayati¹ & Dian Angriani²

¹*Department Science Education, Universitas Pendidikan Indonesia, Indonesia*

²*Departemen Chemistry Education, Universitas Negeri Makassar, Indonesia*

Received: 26 May 2018

Accepted: 07 May 2018

Published: 14 May 2018

ABSTRACT

This research aims to know the effectiveness of using drill method with students learning outcomes. The research design used was one – group pretest -posttest design. Participants in this study were 30 students in class XII science in South Sulawesi, Indonesia. The sampling technique was simple random sampling. Instruments used was essay consisted of seven questions. Data analysis in this research was done by using descriptive statistical analysis and inferential analysis. Descriptive statistical was used to analyze the data of students learning outcomes and the effectiveness of the learning. Inferential analysis was performed using SPSS Statistics 20 for windows program. Normality testing was performed using Kolmogorov-Smirnov test. The result showed that the use of with drill methods is effective in improving students learning outcomes of class XI science

KEYWORDS: *Drill Method, Students Learning Outcomes*

INTRODUCTION

One of the demands of the 21st century is to be able to communicate ideas well, thus the others can understand and recognize the importance of the idea. Communicating an idea is closely related to the demands of Curriculum 2013, where students are required to be more active and creative in addressing problems [1], [2], [3], [4]. Curriculum 2013 aims to develop the potential of learners. The perfection of the mindset we have to do is to change, passive learning pattern into active learning [5]. Therefore, the creativity of teachers in implementing the curriculum in the learning activities will determine the achievement of curriculum targets. Teacher's creativity must be adjusted to the conditions or problems experienced by the students.

According to the observation results conducted in one of the Senior high school in Makassar, students in science class XI had difficulties in learning chemistry. Learning difficulties of students, especially on issues related to the calculation. This can be seen from the results of student learning in the odd semester, for example on the topic of reaction rate and chemical equilibrium that showed a low mean score. Another difficult topic is solubility and solubility constant, where the students' ability in operating mathematical calculations is needed. The student needs more explanation from the teacher in order to understand the calculation.

The problem can be solved by applying an appropriate learning approach, model, strategy, method or technique. One of the important things that the teachers need to do is present a method in accordance with the characteristics of the material. The ability of teachers in choosing and determining the method of learning will greatly affects the student

learning outcomes. The use of appropriate methods will also determine the effectiveness and efficiency of learning.

The learning method is a way to create educational interaction between teacher and student in the learning process. Therefore, learning method plays a role to create a conducive teaching and learning process. Drill or training method is a way of teaching in which students carry out exercise activities so that students have the dexterity or skills higher than what has been learned. This drilling method uses the principle of repetition. By repeating the power to observe, consider, remember, fantasize, feel, think and so will grow. Just as a sharpened blade will become sharp, then the forces trained with the procurement of repetitions will become perfect, as the saying goes "practice makes perfect" [6] Learning by drill method makes students more active in doing exercises, asking questions about the difficulties and confident in delivering answers in front of the class.

The previous researchers showed that drill method was effective in improving student learning outcome [7] [8], [9], students understanding [10], and motivation [12]. The results showed that the findings of this study indicate that the strategy instruction and drill-and-practice instruction differential effects on the automatization of addition skills, depending on student characteristics. [13]. From the above description, the researcher was interested to investigate the effectiveness of using Drill Method on Student learning outcome on the topic of solubility and solubility product constant.

METHODS

The research *design* used was *one – group pretest-posttest design*. Treatment given was drill method. Participants in this study were 30 students in class XII science in one of the public schools in South Sulawesi Province, Indonesia. The sampling technique was taken by *simple random sampling*

The research instrument used essay consisted of seven questions. The content of the instrument was validated by the lecturer and chemistry teacher. The calculation of item validation was done by using product moment correlation [14].

Data analysis in this research was done by using descriptive statistical analysis and inferential analysis. The descriptive statistical analysis was used to analyze the data of students learning outcomes and the effectiveness of the learning. The data of effectiveness were calculated using normalized gain (N-gain) according to [15]. Table 1 shows N-gain criteria.

Tabel 1: Normalized Gain Criteria

Score (g)	Classification
$0,70 < g \leq 1,00$	High
$0,30 < g \leq 0,70$	Average
$0,00 < g \leq 0,30$	Low

An inferential statistical analysis was used to test the hypothesis of whether drill methods are significantly effective in improving student learning outcomes or not. The test was performed using SPSS Statistics 20 for windows program. Prior to hypothesis testing, normality and homogeneity test should be performed. Normality testing was performed using Kolmogorov-Smirnov test. The test used a 0.05 significance level. If the significance > 0.05 then the data is normally distributed, otherwise if the significance < 0.05 then the data is not normally distributed. Homogeneity testing was done by using homogeneity of variance test. If the significance < 0.05 then the variance of groups is not the same; otherwise, if significance > 0.05 variance of the groups is the same.

Hypothesis testing was done by using paired sample t-test. Paired sample t-test was used to determine whether there is significant differences in student learning outcomes before and after the learning process. The test used a 0.05 significance level. If $t\text{-count} > t\text{-table}$, then H_0 is rejected.

RESULTS AND DISCUSSIONS

The results section describes student learning outcomes on the topic of the solubility and solubility constant product before and after the treatment.

Table 2: Statistics of Student Learning Outcomes

Statistics	Score	
	Pretest	Posttest
The number of students	30	30
Max value	100	100
The highest score	40	97
The lowest value	14	66
Range	26	31
Mean	24,17	82,76
Standard deviation	6,39	7,47

Table 2 shows the statistic data of student learning outcomes. The mean score obtained by the student before the lesson (pretest) was 24.17 with the highest score of 40 and the lowest score was 14 of the maximum score 100. The standard deviation achieved was 6.39. The mean score obtained by the students after following the drill method (posttest) was 82,76 with the highest score was 97 and the lowest score was 66. The standard deviation achieved was 7,47. The results of this statistic showed that there is an increase in student learning outcomes after the learning. Student learning outcomes have improved after following through drill method. This is because drill learning makes students more active in doing exercises, asking questions about the difficulties and confident in delivering answers in front of the class. The use of drill methods in the learning process makes students more agiler so it improves students' motivation and learning outcomes.

The effectiveness of using drill method was calculated using gain score. The gain score was the difference between the mean score of the posttest and pretest. The results of the effectiveness test are shown in Table IV.

Table 3: The Effectiveness Test of Students with the Formula GAIN

Description	score
Total	30
Pretest Average	8,57
Posttest Average (X_2)	29,18
Maximum score (SM)	35
N-gain	0,77

Table 3 shows the effectiveness test by using drill method. From the calculation, the N-gain score was 0.77 (high). It indicates that drill method is effective to improve learning outcome. To support the descriptive statistical analysis, inferential statistical analysis was performed. The inferential statistical analysis was performed using paired sample t-test to determine whether there are significant differences in student learning outcomes before and after learning. Based on result, the value of $t\text{-count} > t\text{-table}$ ($38,160 > 2,045$), then H_0 was rejected and H_1 was accepted. This shows that there are significant differences in student learning outcomes before and after learning. Thus, it can be concluded that the

use of drill method is effective in improving student learning outcomes.

Student learning outcomes have improved after following drill method. This is because drill learning makes students more active in doing exercises, asking questions about the difficulties and confident in delivering answers in front of the class. The use of drill methods in the learning process makes students more agiler so it improves students' motivation and learning outcomes.

CONCLUSIONS

Based on the result, the use drill methods are effective in improving student learning outcomes of class XI science. Drilling method is an alternative method of teaching of the teacher who will deliver a lot of calculation formula in the learning.

ACKNOWLEDGEMENTS

N. Thanks to Indonesia Endowment Fund for Education Scholarship (LPDP), Republic of Indonesia for financing my Master

REFERENCES

1. Sherwyn P. Morreale & Judy C. Pearson. *Why Communication Education is Important: The Centrality of the Discipline in the 21st Century*. *Journal Communication Education*.57(2), 2008, 2-5
2. Niemi, Hannel, Harju Vilhelmiina, Vivitsou Marianna, Viitanen Kirsi, Multisilta Jari Kuokkane Anne. *Digital Storytelling for 21St Century Skills in Virtual Learning Environments*. *Journal Creative Education*. (<http://www.scirp.org/journal/cehttp://dx.doi.org/10.4236/ce.2014.5907>). 2014.
3. Kivunja, Charle. *Innovative Pedagogies in Higher Education to Become Effective Teachers of 21st Century Skills: Unpacking the Learning and Innovations Skills Domain of the New Learning Paradigm*. *International Journal of Higher Education*. 3(4), 2014, 3-8
4. Kivunja, Charle. *Do You Want Your Students to Be Job-Ready with 21st Century Skills? Change Pedagogies: A Pedagogical Paradigm Shift from Vygotskyian Social Constructivism to Critical Thinking, Problem Solving and Siemens' Digital Connectivism*. *International Journal of Higher Education*. 3(3), 2014, 4-9
5. *Permendikbud*. (2013). *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 70 Tahun 2013 Tentang Kerangka Dasar Dan Struktur Kurikulum Sekolah Menengah Kejuruan/Madrasah Aliyah Kejuruan*
6. Dimiyati dan Mudjiono. *Belajar dan Pembelajaran*. (Jakarta: PT Rineka Cipta. 2006).
7. Setyawan, Fredy, santosa dan Supardi. *Penerapan teknik cacil Laser sebagai pendekatan metode Drill pada materi redoks*. *Journal of mechanical Engineering Learning* 3(2), 2012, 6
8. Susanti, armydha Dwi, Subroto dan Siadi. *Metode pembelajaran Selecting Organizing Integrating melalui Pendekatan Metode Drill*. *Journal Chemistry Education* 1(1), 2012, 6

9. Nurhayati, Fitri, Redjeki Tri dan Utami Budi. Efektivitas Pembelajaran Dengan Metode Drill And Practice dan Learning Cycle 5E Disertai Media Pembelajaran Crossword Puzzle Terhadap Prestasi Belajar Siswa Pada Materi Pokok Hidrokarbon Kelas X Semester Genap SMA Negeri Kebakkramat. *Jurnal Pendidikan Kimia (JPK)*, 2(3), 2013, 8
10. Chi-Hong Leung et al., *Teaching to Enhance Student Learning from a Perspective of Brain Functions*, *International Journal of Educational Science and Research (IJESR)*, Volume 6, Issue 6, November-December 2016, pp. 11-20
11. Ratmaningsih, Enok. Efektivitas Metode Drill dan resitasi dalam meningkatkan pemahaman dan keterampilan siswa terhadap Hukum bacaan Qolqolah dan Ro' Di SMP Negeri 1 Subang. *Jurnal Pendidikan Agama Islam - Ta'lim* Vol. 10 (1), 2012, 18
12. Effendi, Yusuf, Muhammad. Penerapan Metode Pembelajaran drill untuk Meningkatkan Hasil Belajar Peserta didik pada Standar Kompetensi Mengukur. *Journal Pendidikan teknik* 14 (1), 2014, 5.
13. Lestari Tri, Wujoso Hari, Suryani Nunuk. Pengaruh Metode Pembelajaran Ceramah Plus dan Metode Drill terhadap Motivasi Belajar dan Hasil Belajar pada Kompetensi Dasar Efisiensi penggunaan Tempat Tidur Rumah Sakit. *Jurnal Media Ilmu Keolahragaan Indonesia*. 7(1), 2017, 8.
14. Tournaky, Nelly. *The Differential Effects of Teaching Addition Through Strategy Instruction Versus Drill and Practice to Students With and Without Learning Disabilities*. *Journal of Learning Disabilities*. 36(5), 2003, 8
15. Arikunto, S. *Dasar-Dasar Evaluasi Pendidikan*. (Jakarta: Bumi Aksara:2010)
16. Hake, R. *Interactive-Engagemen Versus Traditional Methods: A Six-Thousand-Students Survey of Mechanics Test Data for Introductory Phisics Courses*, 61 (1), 1998, 65.

