

THE IMPROVEMENT OF STUDENTS' ACHIEVEMENT AND SOCIAL MATURITY ON CHEMISTRY LEARNING THROUGH THE ASSISTANCE OF LOCAL WISDOM VIDEOS

Jaslin Ikhsan¹, Sulistiana Febriawati²

Faculty of Mathematics and Natural Science, State University of Yogyakarta
Karangmalang, Yogyakarta, Indonesia, 55281
Email: jaslinikhsan@gmail.com, febriawatisulistiana@gmail.com

Abstract- The awareness of the strength of local wisdom in the development of students' characters lead to the need of teachers to integrate local wisdom contents into learning, including Chemistry learning. In this research, local wisdom contents were integrated into chemistry contents of electrochemistry, and presented in the formats of videos. The videos were used as enrichment materials, and their effect to students' achievement and maturity were investigated by comparing both data from experiment and control groups. There were 9 videos developed by use of Borg and Gall model. The samples were 40 students in an experiment group, and other 40 students in a control group at the senior high school of MA Muallimat Muhammadiyah Yogyakarta. The difference of learning process between both groups of samples was the use of the videos outside of face-to-face by students at experiment group. After 4 times of face-to-face learning, the improvement of students' achievement was measured by test, and students' maturity was by observation as well as a questionnaire. The comparison of the improvement both students' achievement and maturity were analyzed by MANOVA (Multivariate Analysis of Variance) of SPSS V.16 from which the value of hotelling's trace was 0.983 ($p > 0.000$). It showed that the improvement of achievement and social maturity of students from experiment group was not different from that was from control group as the effect of the use of videos containing local wisdom integration into electrochemistry materials.

Keywords: video, local wisdom, student social maturity, student achievement

I. INTRODUCTION

Educators and governments have been indeed supported by technology, where the transformation of education system is able to be flexible in open distance learning. Technology is the infrastructure and main path of distance education. It is dramatically affecting pedagogic sectors [1]. The high demand of technology use forces educators to develop more and more learning media that enable students to study independently without facing teachers.

Students should be able to search sources for learning themselves. It makes educators facilitate students by using some easy-accessed learning media that enable students to be assisted. Internet is exactly a close friend of students. One of the easiest media to be assessed is videos which can be downloaded and enjoyed wherever, whenever, by who ever, and with whomever. Students are expected to love learning and enjoy the materials especially in electrochemistry materials in chemistry subject. The goal is that students can have better student achievement.

Moreover, education is not only as a sector that focuses on cognitive aspect but also as the sector concerning on affective field. One effort to reach it is by the use of local wisdom that is integrated in videos to integrate students' social maturity. Students are expected to be more responsible to their regions and more aware to the environment. Therefore, using the videos containing local wisdom integration as the technology performance is so important to be developed by educators in order to support governments and educators in developing pedagogic aspects.

II. RESEARCH METHOD

Nine videos were developed through Borg and Gall Model. The videos were assessed by six chemistry teachers. After that, the videos were treated to the students of treatment class. The samples were 40 students from treatment class as well as from control class. The population was the students of Class XII of Muallimat Muhammadiyah Boarding School Yogyakarta, Indonesia. This was an experimental research that had treatment class that had been treated and control class as comparison.

There were two data used in this study. The first one is the data of students' achievement obtained by using pencil- paper test and the second one is the data of social maturity obtained by using questionnaires validated by some experts. Multivariate analysis of variance was the analysis method to measure the improvement difference of two dependent variables (student achievement and social maturity) of both groups.

III. Results and Discussion

Borg and Gall model was used in video development. The materials contained were about electrochemistry related to local wisdom of Yogyakarta. The data of product quality were obtained from reviewer assessment. The data in the format of suggestion were summarised and concluded to revise the videos. Next, the data from some lists of statements in questionnaires were analysed. It was suggested as a good media.

Using videos in learning is so beneficial that it can support students to understand more.[2] stated that media characteristics affect technology- based learning. These facts revealed the need of technology in education field to improve the advance of higher quality of education. In addition, the use of on line video increases students' interest and grow alternative approach in teaching [3]. Furthermore, more-advanced learning needs an alternative tutoring approach to support face to face learning [4]. The videos contain slightly different materials from what teachers teach in class because it is for enrichment program. The difference is that the materials are simpler but still related to the goals of learning electrochemistry. Besides that, the videos can be portable and slower than that is in classroom lectures [5]. Students can replay it if they pass some parts of video. Since the videos can be assessed on line, it enables students to use either in on line classes or direct courses. The latest large- scale survey by [6] claims that students like learning by the use of video. It is quite similar to watching television programs independently and freely. Moreover, it allows students to study at their own pace, with pause, rewind, and instant playback. The main purpose is to improve students' achievement by making an attracting learning.

Integrating local wisdom in the videos were also the efforts to give some stimulant to the students to be more aware in social life. Local wisdom defines as community experiences designed to be knowledge that is contributing in controlling human [7]. That motivating students through inserting local wisdom aspects in education media means controlling students' behaviour indirectly. The focus here is the collaboration of videos and local wisdom to improve both students' achievement and social maturity directly. It is such a particular form of improving outcomes of education [8]. Educators always tried to take efforts of making good outcomes in every round of cyclic path in classrooms. Local wisdom might be wished as the policy to prevent truancy, improve behaviour, or reduce foolishness that were packaged in one attitude tested by using questionnaires (social maturity).

Teachers' roles were creating chemistry learning environment to get the use of the videos. Teachers also functioned as controllers that controlled about not only what students do but also when students speak and make noise [9]. Teachers could also be moderator that can encourage students to participate in responding to the videos. Teachers should give the basic knowledge first to support students' prior knowledge in understanding the materials. After that, teachers also ask the feedback of the videos [10]. If the videos were not watched in class, teachers should control it through some tasks of feedback videos.

These videos were also tested to the students of both control and treatment classes. The diagram below shows the research design as the steps of this study. First of all, some videos were made and assessed by six chemistry teachers. The assessment included some aspects (materials, language, application, audio performance, and visual) which were assessed by using questionnaires in Likert scale. After that, four face to face learning were held in both classes (treatment and control class). The existence of video assistance was the difference of the treatment in this research. Then, the students filled questionnaires of social maturity as the final data of social maturity. There were the criterions using Likert scale in the questionnaire. The data of Likert scale performed in ordinal data in SPSS. Because of this reason, it had to be transformed first to be interval data in SPSS to enable it be analysed in Multivariate Analysis of Variance with the data of students' achievement that were performed as interval

data, too. In order to make sure that the data were homogeny and normal, there must be homogeneity and normality tests for both data (social maturity and student' achievement) in both groups of students.

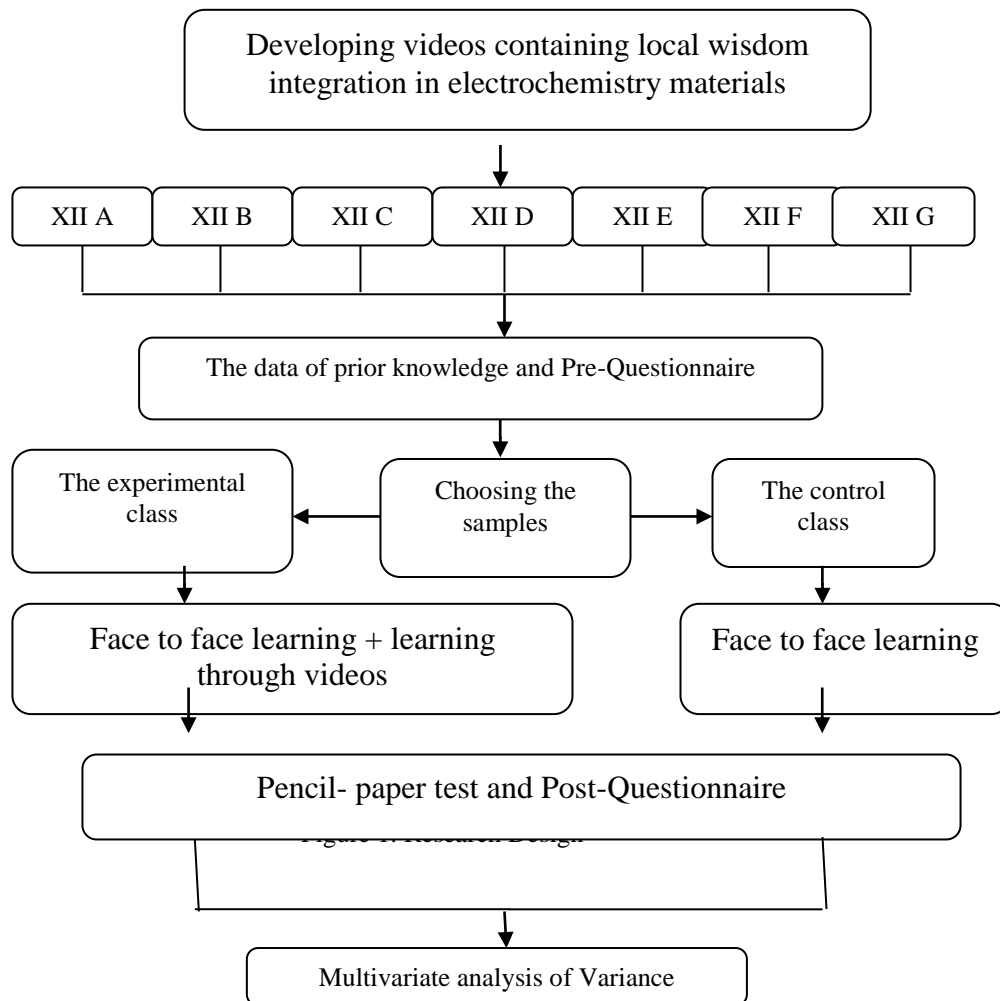


Figure 1. Research Design

Multivariate Analysis of Variance (MANOVA) is a *Hotelling T^2* test. Two major situations that enable MANOVA is used are when there are some correlated dependent variables and researchers like to make it in a set and when researchers want to explore how independent variables affect some dependent variables [11]. The disadvantage of using this analysis is that it can not solve with multi factorial ANOVA. That is why it cannot cope with the partition variation across many factors in experimental research [12]. Multivariate analysis of variance is when there are two or more dependent variables in a set [13]. Two dependent variables studied in this research were student achievement and social maturity.

Multivariate Test

Intercept	Pillai's Trace	.996	9.456E3 ^a	2.000	74.000	.000	18911.654	1.000
	Wilks' Lambda	.004	9.456E3 ^a	2.000	74.000	.000	18911.654	1.000
	Hotelling's Trace	255.563	9.456E3 ^a	2.000	74.000	.000	18911.654	1.000
	Roy's Largest Root	255.563	9.456E3 ^a	2.000	74.000	.000	18911.654	1.000
Kelas	Pillai's Trace	.215	10.129 ^a	2.000	74.000	.000	20.258	.983
	Wilks' Lambda	.785	10.129 ^a	2.000	74.000	.000	20.258	.983
	Hotelling's Trace	.274	10.129 ^a	2.000	74.000	.000	20.258	.983
	Roy's Largest Root	.274	10.129 ^a	2.000	74.000	.000	20.258	.983

a. Exact statistic

b. Computed using alpha = .05

c. Design: Intercept + kelas

Figure 2. Multivariate Test

The value of significance at hotelling's trace was 0.983 ($p > 0$) meaning the improvement of student achievement and social maturity of treatment class was not different from that of control class. Such result might be because of the influence of teachers as well as motivational and social engagement [14]. These factors often affected the result of educational study. Teachers could also be the factors that affect it because of their difference in performance, speech, language, and thinking while teaching students. In specific condition, though students, rooms, schools, or some other visible variables are the same between two groups (treatment and non treatment), they might yield difference because of some unobservable variables that could not be controlled [15]. Sex can also affect social maturity itself because it gives different impacts to women and men. In fact, there is a growing proof that showed women and men experienced different sensitive feeling and will. Men act more strongly and lead gently. Besides that, men also could react to be wise. On the other side, women liked keep others' commitment and be more sensitive in feeling [16]. The difference of these could also be the factor that affected the result of this study.

IV. CONCLUSION

This study performed that the students achievement and social maturity improvement of the students from treatment class was not different from those who were from control class after assisted by using videos that contained local wisdom integration in chemistry.

REFERENCES

- [1] Keegan, Desmond and Lockwood, Fred. (2005). *Open and Distance Learning Today*. New York: Routledge.
- [2] Moreno, R. (2006). Learning in High-Tech and Multimedia Environments. *Current Direction in Psychological Science*, 15(2), 63-67.
- [3] Ozkan, Betul. (2002). The Use of Video Cases in Teacher Education. *The Turkish Online Journal of Educational Technology*, 1(1),37-4
- [4] Merrill, D.C., Reiser, B. J., Ranney, M., and Trafton, J.G. (1992). Effective Tutoring Techniques: A Comparison of Human Tutors and Intelligent Tutoring System. *The Journal of the Learning Sciences*, 2(3), 277-305
- [5] Brecht, H. David. (2012). Learning from Online Video Lectures. *Journal of Information Technology Education: Innovation in Practice*, (11),227-250.

- [6] Canning- Wilson, Christine and Julie Wallace. (2000). Practical Aspects of Using Video in the Foreign Language Classroom. *The Internet TESL Journal*, 6(6).
- [7] Kongprasertamon, Kamonthip. (2007). Local Wisdom: Environmental Community and Development: The Clam Farmers in Tambon Bangkhunsai, Phetcaburi Province, Thailand, *Journal of Humanities*, 10(1),1-10
- [8] Charter-Wall, Charlotte and Grahame Whitfield. (2010). *The Role of Aspiration, Attitudes, and Behaviour in Closing the Educational Attainment Gap*. UK: Joseph Rowntree Foundation.
- [9] Cakir, Ismail.(2006). The Use of Video as an Audio-Visual Material in Foreign Language Teaching Classroom. *The Turkish online Journal of Educational Technology*, 5(4),67-72
- [10] Wang, Zhaogang. (2014). *An Analysis on the Use of Video Materials in College English Teaching in China*, 2(1), 23-28.
- [11] Anderson, Marti J.(2001). A New Method for Non-Parametric Multivariate Analysis of Variance. *Austral Ecology*, 26, 32-46.
- [12] Chaves, Luis Fernando. (2010). *An Entomologist Guide to Demystify Pseudoreplication: Data Analysis of Field Studies with Design Constraints*, 47(3),291-298.
- [13] Mayers, Andrew. (2013). *Introduction of Statistics and SPSS in Psychology*. New York: Pearson Education Limited
- [14] Randler, Christoph and Franz X. Bogner. (2008). Planing Experiments in Science Education Research: Comparison of a Quasi- Experimental Approach with a Matched Pair Tendem Design. *International Journal of Environment and Science Education*, 3(3), 95-10
- [15] Walser, Tamara M. (2014). Practical Assessment, Research, & Evaluation. *A Peer-Reviewed Electronic Journal*, 19(6), 1-8.
- [16] Haselton, Martie G.(2005). Irrational Emotions or Emotional Wisdom? The Evolutionary Psychology of Emotions and Behavior. *Evolutionary Psychology of Emotions*,6,1-21.

