Contribution of Media Based Learning on Traditional Culture Equipment for Student Motivation and Misconception

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ABSTRACT

The purpose of this study was to explore the contribution media based learning on traditional culture equipment on motivation and misconceptions of students. The method used is a quasi-experiment research was conducted in Kampar Junior High Schools of 121 students. Data Analysis that used is descriptive and inferential analysis. Based on the results of data analysis showed that the contribution of the media based learning on traditional culture equipment for increased motivation and to lower the misconception. This shows the media based learning on traditional culture-equipment can improve motivation and can reduce misconceptions of students.

***Keywords**: Media Learning, Misconception, Motivation, Traditional Culture*

Introduction

Physics is not only knowledge of science about facts, concepts, or principles but also a process of discovery learning, science education should be focus on providing direct experience giving directly to increase the competence so that students can understand about scientifically. Science Education is focused on "finding out" and "doing" so that students gain a more basic understanding of their environment (permendiknas, 2006)

In old paradigms physics is a less desirable lesson (Afrizal Mayub, 2005). Abstract concept of physics is one of the causes so difficult to understand it, the formulas of physics become the basis in solving the problems of physics, while, the concept of physics is not noticed. For easy, the abstract physics formula can be made simple and real so that the problems that have been happening can be resolved that, one of the solution of this problem is required of instructional media.

The formation of a scientific conception will be disrupted by the misconception of the student that continues to occur. Luchembe et al (2014) said that understanding the concepts of students is very important in studying other physics concepts. Student learning difficulties can be caused by learning that does not pay attention to misconceptions, resulting in low learning outcomes. Ephias & Tawanda (2014) revealed that student misconceptions often occur due to traditional learning. The traditional learning paradigm assumes that knowledge can be transferred from teacher to student overall, this paradigm must be

changed to the constructivism paradigm where knowledge is built within the student (Kablan & Kaya, 2014).

Physics misconceptions that often occur in the mechanics lesson of them on the Force, (Semih, 2015). Another study of students understanding of the concepts of physics shows that many students experience misconceptions in various concepts which are the basis of knowledge of physics. From many studies it was found that the misconception of physics of students greatly inhibits the understanding of student concepts (Chee, 2010; Simanek, 2008). The same thing happened to the university level. The same is stated by Erol et al, 2015 that traditional teaching and learning processes cannot overcome misconceptions.

The role of media learning is very influential in the process of physics learning because the media serves to clarify the lessons being taught (Yuliandari, 2012; Sukarno & Sutarman, 2014). Anita (2009) said that there are a lot of media learning, there is no research that states that the superiority of one media to other media. Media who have their own characteristics each has advantages and weaknesses of each therefore the teacher must be observant in using media in accordance with the characteristics of students and lesson material to be taught, simple media learning more effective and more efficient if packaged properly and presented to the right students as well. Arsyad (2007) states that educational media can be used both inside and outside the classroom, using communication media between teachers and students in the learning process more can be intertwined.

The learning process is a process of interaction and communication between students, teachers and lessons. The interaction will not work without the means to deliver a message or the media, Rusman (2012). According Ashyar (2012), the media serves as: 1. provide the right message to students. 2. Adding attraction to the subject, and can increase student motivation. With the media attention of students can focus to follow the lesson delivered teachers, so that the lesson process more effective and can improve learning outcomes. 3. Media can stimulate students to think critically, using their imagination, have a better attitude, so that creativity and innovation work more developed. Sitanggang (2013) explains that the media is able to consist of all objects (living or dead objects) that can serve as an intermediary in the learning process.

Culture can be used as one of contextual media learning. Cultural learning process can be used as a strategy of creating learning environment and design learning experiences that implements culture as part of learning process (Dirjen Dikti, 2004). The culture that is implemented in learning is based on the recognition of culture as a very important part of education, expression and communication of ideas, and the development of knowledge. Implementation of learning the local culture in the learning process not only can improve learning outcomes but can also increase interest in traditional/local culture (Morales, 2014; Malaluan & Masangcay, 2015)

The contextual approach is an approach that teaches students to connect the content of the subject matter with the context of day-to-day life in find out of meaning, (Jonhson 2012). The contextual approach as a learning approach has seven components that teachers need to develop among them, (1) constructivism, (2) inquiry, (3) questioning, (4) learning community, (5)) modeling, (6) reflection, and (7) an authentic assessment (Rusman, 2012).

Developing and maintaining a sense of wonder and curious learners about the natural world, can be developed using a based

approach (Eser & Neslihan, 2014). Contextual learning can help students to connect scientific knowledge with real life (Laguador, 2014; Korganci et al, 2015; Hasruddin et al, 2015). Contextual Learning encourage meaning by using context, thus increasing "need-to-know" (Yigit, 2010) so that, positive interests and attitudes of students increase toward physics (Eser ÜLTAY, 2014).

Cultural-based learning is based on the recognition of culture as a fundamental part of education, expression and communication of ideas, and the development of knowledge, Culture-based learning is a strategy of creating learning environments and learning experiences that collaborate cultures as part of the learning process (Dirjen Dikti, 2004).

Culture-based learning is one form of multiple representation of learning, or the form of assessing understanding in various forms. According to Adhitama et al (2015) learning with culture, culture and its manifestation becomes media learning in the learning process, contextual learning. Learning with culture is very effective to make students understand the lesson (Jasni and Zulikha, 2013).

Methodology

This research was conducted in Kampar, Academic Year 2017/2018. Research was conducted from July-November 2017.

The research use a quasi-experiment design, independent variable is teaching using hardware-media based learning, while traditional culture is the dependent variable and misconceptions of student motivation. Design research such as table 1.

Table 1. One Group Pretest Posttest Design

Pre Exam	Intervention	Post Exam
O_1	X	O_2
O_3		O_4

X = treatment

O_1 = pretest before research

O_2 = posttest after research

O_3 = pretest (control classes)

O_4 = posttest (control classes)

This research was conducted in the Kampar Junior High School with samples 121 students consisting of 61 students in the experimental class and 60 students in the control class

Data collected is the motivation and misconceptions of students. Instrument of data collection is the students learning motivation questionnaire as many as 34 items of questions and misconceptions test as many as 30 items.

The technique of collecting data from this study is a result score student motivation and misconceptions students through the provision of *pretest and posttest.* The sequence of data collection:

a. Providing *a pretest* to the control and experiment classes to know initial motivation
   and students misconceptions about force materials and its application
b. Providing *treatment* to the experiment classes on the subject matter and the force of its application to the treatment of learning through media based learning on traditional culture equipment
c. Providing *posttest* (motivation and misconceptions) to the control and the experimental class.
d. Assessing the test results obtained by the control and experimental classes have

been getting treatment, then the data were analyzed and prepared to make a report of research results.

The Data analysis technique was conducted byusing descriptive and inferential analysis. Descriptive analysis is a way of analyzing data with describe or depict the data that has been gathered as it is without intending to apply to the general conclusion or generalization.

Descriptive analysis used in this study to provide an overview of increase motivation and decrease misconceptions physics students after the media based learning on traditional culture equipment.

Data analysis is taken from the initial and final motivation questionnaire. Statistical analysis for the initial and final motivation of the experiment class and control class. Motivation score is based on Likert Scala, table 2.

Table 2: Scores Student Motivation

Question	**Response score**			
	SS	S	TS	STS
Positif	4	3	2	1
Negatif	1	2	3	4

To classify learners into motivation level score use provisions such as table 3:

Table 3: Category average Motivation Student

The average score of motivation	Category Scores
1.00 - 2.00	Low (R)
2.00 -3.00	Medium (S)
3.00 -4.00	High (T)

Analysis of data misconception taken by initial and final misconception test. Statistical analysis description used to initial and final misconception score for the experimental and control classes.

Student answers analysed in two stages. The first stage that is scoring on each question, the second stage with an abiding interpreting level on each score.

The first stage is give score for each questions. Problem of misconceptions were scored on the following conditions:

Score 5 : if response of instrument correct, the reason correct, and give additional reasons
Score 4: if the response of instrument correct and reason correct
Score 3: if the response of instrument correct and reason incorrect
Score 2: if the response of instrument incorrect and reason correct
Score 1: if no response

The second stage is the interpretation on each score. The interpretation of the score described in Table 4:

Table 4 Interpretation Score Misconceptions Student Test Results

No	Level of understanding	Score	Interpretation
1	No misconceptions	4, 5	Understand
2	Misconceptions	1,2,3	Miss understand

Inferential analysis to know the difference of each submotivation and submisconception can be run MANOVA analysis. Furthermore, the result of research indicate there are significant differences in MANOVA analysis, the effect size (the influence of free variables) is seen to know the percentage of independent variables to the dependent variable, the size effect is determined based on the value of the squared eta. According to Cohen (1988), the value of eta squared 0.01 is a small effect, the value of .06 is a simple effect whereas the value of

0.14 is a large effect, the interpretation of the squared eta values is shown as table 5.

Table 5: Interpretation of image size based on the value of Eta Squared

No	interpretation	Effect size
1	0.01	Small
2	0.06	Medium
3	0.14	Big

Source: Cohen 1988

Result and Discussion

The final Motivation Score of students in different classes (experiments and controls) is shown in table 6. The mean score analysis of Final Motivation is as follows.

Table 6. Description of final motivation statistics by treatment

Class	n	Value min	Value max	min
Eksperimen	61	2.86	3.64	3.22
Control	60	2.36	3.47	3.02

Class	n	Standard deviation	varian	Kurto sis
Eksperimen	61	0.18	0.034	-0.585
Control	60	0.28	0.080	-0.478

Table 7. Description of final misconception statistics based on different treatment

Class	n	Value min	Value max	min
Eksperimen	61	2.57	4.27	3.41
Control	60	2.57	4.10	3.12

Class	n	Standard deviation	varian	Kurto sis
Eksperimen	61	0.45	0.20	-0.66
Control	60	0.48	0.23	-0.796

From table 6 and 7 it was found that the mean of motivation scores and misconception scores for the experimental class were much higher in the experimental class, from table 6 the mean motivation for the experiment class was 3.22 while the control class was 3.02, this trend also occurred on the misconception score, where the average score in the expreading class is 3.41 whereas in the control class is 3.12.

Inferential differences in motivation based on treatment differences can be seen as Table 8 below.

Table 8. MANOVA Differences of Motivation elements based on treatment differences

Source	Learn variable	Type III power of two	Df	Min power two
set	Attention	0.824	1	0.824
	Relevant	2.205	1	2.205
	Confidence	1.696	1	1.696
	Satisfaction	0.660	1	0.660

Learn variable	F	Sig	Partial (η^2)
Attention	12.651	0.001	0.181
Relevant	24.252	0.000	0.156
Confidence	20.263	0.000	0.132
Satisfaction	4.493	0.036	0.134

The result of MANOVA analysis shows that there are significant differences of motivation in the class with different treatment (experiment and control), seen on the effect of size obtained, that is 0.181 in the attention variable, 0.156 on the relevant variables, 0.132 in confidence variable and 0.134 on the satisfaction variable, learning and teaching with different classroom-based learning media (experiment and control) contributed 18.1% on the attention variable, 15.6% on relevant variables, 13.2% in confidence variables and 13.4% in satisfaction variables.

Inferential misconception of physics students based on different treatment as table 9 below.

Table 9 Difference of Misconceptions elements based on different treatment

source	Lean variable	Type III power of two	Df	Min power two
set	Force	1.661	1	1.66
	Newton Laws	4.692	1	4.69
	Work and energy	1.733	1	1.73
	Simple machine	2.706	1	2.70

Lean variable	F	Sig	Partial (η^2)
Force	6.28	0.014	0.42
Newton Laws	13.38	0.000	0.84
Work and energy	5.90	0.017	0.68
Simple machine	10.39	0.002	0.30

The result of MANOVA analysis showed that there were significant differences of misconception on class group with different treatment, seen in effect size also higher in class with different treatment, that is 0.42 on the topic of force, 0.84 on the topic of newton law, 0.68 on work and energy topic and 0.30 on a simple machine, meaning learning and teaching using media based learning on traditional culture equipment based on different treatments (experiments and controls) contributed 42% on force topics, 84%, on newton law topics, 68% on work and energy topics and 30 % on the topic of simple machine.

Conclusion

Based on the data that has been collected and analysis on the discussion that has been described, it can be concluded that the media based learning on traditional cultural equipment and traditional learning there are significant differences, as well as in terms of effect size, size effect category both in increasing motivation and in decreasing misconception big category

From the results of this study can be concluded that the media based learning on traditional cultural equipment can increase motivation and reduce the student physics misconception

References

Adhitama, E., Nur Aini, A & Widarwati, G. 2015.. "*Wayang Saintis" The Learning Media Based On Culture As An Illustration Of Scientist For Physics Teaching*. *15th Indonesian Scholars International Convention.* London.

Anita, S.(2009). *Media Pembelajaran.* Surakarta : UNS Press.

Arsyad, A.(2007). *Media Pembelajaran*.Jakarta : Raja Grafindo Persada.

Ashyar, R. 2012. *Kreatif Mengembangkan Media Pembelajaran*. Jakarta: Referensi Jakarta

Chee, T. C. 2010. Common Misconceptions in Frictional Force among University

Cohen, J. 1988. Statistical Power Analysis for the Behavioral Sciences (2nd ed). Hillsdale, NJ: Lawrence Earlbaum Associates

Dirjen Dikti. 2004.Pedoman Pengintegrasian Pembelajaran Berbasis Budaya dalam Pembelajaran

Ephias, G & Tawanda, M. 2014. *Pedagogics of chemical bonding in Chemistry;perspectives and potential for progress: The case of Zimbabwe secondary education. International Journal of Secondary Education* 2(1): 11-19. Zimbabwe.

Erol, T., et al. 2015. *The effects of classic and web-designed conceptual change texts on the subject of water chemistry. International Electronic Journal of*

Elementary Education 7(2) : 263-280. Turkey.

Eser ÜLTAY. 2014, Context-Based Physics Studies: A Thematic Review of the Literature. Journal of Education. Giresun, Turkey,

Eser, U & Neslihan, U. 2014. *Context-Based Physics Studies: A Thematic Review of the Literature. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi (H. U. Journal of Education)* 29(3): 197-219.

Jasni, A & Zulikha, J. 2013. *Utilising Wayang Kulit for Deep-Learning in Mathematics. Proceedings of the World Congress on Engineering 2013* Vol II : London

Jonhson, Elaine B. 2012. Contextual Teaching and Learning: Menjadikan Kegiatan Belajar Mengajar Mengasyikan dan Bermakna.Bandung: Kaifa

Kablan, Z & kaya, S. 2014. *Preservice Teachers' Constructivist Teaching Scores Based on Their Learning Styles. Australian Journal of Teacher Education* 3(12) : 66-76. Kocaeli University.

Lagaudor, J., M. 2014. *Cooperative Learning Approach In An Outcomes-Based Environment. International Journal of Social Sciences, Arts and Humanities* 2(2): 46-55. Philippines.

Luchembe, D. et al. 2014. *The Effect of Using Concept Mapping on Student's Attitude and Achievement When Learning the Physics Topic of Circular and Rotational Motion. European J of Physics Education* 5(4): 10 – 29. Zambia.

Malauluan, N., E & Masancay, D., B. 2015. *Physics Instruction Utilizing Culture-Based Pedagogy. Asia Pacific Journal of Multidisciplinary Research* 3(4) : 50-58. Batangas State University.

Mayub, Afrizal. 2005. e-Learning Fisika Berbasis Macromedia Flash MX. Yogyakarta: Penerbit Graha Ilmu.

Morales, M., P., E. 2014. *The Impact of Culture and Language Sensitive Physics on Concept Attainment. International Journal of Learning, Teaching and Educational Research* 2(1): 1-29. Philippine Normal University

Peraturan Menteri Pendidikan Nasional Nomor 22 Tahun 2006, tentang standar isi

Rusman. 2012. Model-Model Pembelajaran Mengembangkan Profesionalisme Guru. Jakarta: PT Raja Grafindo Persada

Semih DALAKLIOĞLU. *Neşet DEMİRCİ. AyşeGül ŞEKERCİOĞLU. 2015 Eleventh Grade Students' Difficulties and Misconception about Energy and Momentum Concepts International Journal on New Trends in Education andInternational Journal on New Trends in Education and Their Implicatio*ns. January 2015 Volume: 6 Issue: 1 Article: 02 ISSN 1309-6249

Simanek, D. E. 2008. Student Misconceptions Induced By Teachers and Textbook.

Sitanggang, ahmadi, 2013. Alat Peraga Matematika Sederhana untuk Sekolah Dasar, Sumatera Utara : Lembaga Penjaminan Mutu Pendidikan

Sukarno & Sutarman. 2014. *The Development Of Light Reflection Props As A Physics Learning Media In Vocational High School Number 6 Tanjung Jabung Timur. International Journal of Innovation and Scientific Research* 12(2): 346-355. Indonesia

Yigit, N. 2010. Developing presentation skills of student teachers through micro-teaching method. *Energy Education Science and Technology Part B: Social and Educational Studies, 2,* 55-74.