Research on Humanities and Social Sciences
ISSN 2224-5766 (Paper) ISSN 2225-0484 (Online)
Vol.8, No.16, 2018

Teaching Material Based on Project Based Learning for 4th Grader Student of Elementary School

Siswanti* M.Thoha B.Sampurna Jaya Rochmiyati
FKIP Lampung University, Jl. Prof. Dr. Soemantri Brojonegoro No. 1 Indonesia

The research is financed by Bank Central Asia No.OLB1Z

Abstract
This research and development aims to develop a teaching material and a Student Worksheet based on *Project Based Learning* (PjBL) model and to know the difference of learning results between students who use Student Worksheet and students who only use textbook material. The research and development method used was R and D (*Research and Development)*. Borg and Gall Steps. The population of this research was 160 students and the sample of this research with *multi stage random sampling* technique is 30 students. Data collection techniques used were questionnaires, the needs analysis, documentation, observation, expert validation sheets and test. The results showed that the developed Student Worksheet based on PjBL improve students' learning outcomes and it was proved that the scores were higher than the learning process that only use textbook material.
Keywords: learning outcome, student worksheet and project based learning

INTRODUCTION

Learners' success in learning on thematic learning is influenced by how teachers can develop teaching materials in the classroom. Teaching materials can be made in an interesting way which can help teachers in classroom learning. The paradigm of project-based learning includes authentic content, authentic assessment, and explicit assessment. Teachers are designed as a facilitator because they create inquiry models, using cognitive and metacognitive strategies, and provide resources, support, and guidance.

Project Based Learning (PjBL) can enrich learners' knowledge, so they can achieve higher learning outcomes and improve their learning motivation, if learners participate actively in learning activity. The format of activities in PjBL are group learning or team work, so it can improves groups' learning motivation, academic skills and learners' conceptual skills (Moursund,1999, Howard, 2002, Monchai Tiantong 2013, Guo & Yang 2012, Abidin, 2014)

Student Worksheet (*Lembar Kegiatan Peserta Didik*/LKPD) can affect learners' achievements in term of academic achievement, teachers can guide students structurally and add information to student. Furthermore, student worksheet will be able to attract students if combined with certain teaching methods. The student worksheet forms *i.e.*: (1) Student Worksheets that help learners to find a concept (2) Student Worksheets that help students apply and integrate the various found concepts (3) Student Worksheets that serve as study guide (4) Student worksheets that serve as strengthener (5) Student worksheets that serve as practice manual (Prastowo 2011, Lee 2014, Yildirim 2011).

Learning outcome is a product of a learning process that includes two aspects, namely cognitive and affective. Cognitive outcome refer to the development of professional knowledge and skills, while non-cognitive outcomes focus on changing attitudes and individual values. Aspects of cognitive assessment consist of (1) Knowledge, Ability to remember (2) Comprehension, Ability to understand (*e.g.* concluding a paragraph). (3) Application, Ability to implement (*e.g.* using an information / knowledge gained to solve a problem). (4) Analysis, Ability to analyze a broad information into small parts. (5) Synthesis, Ability to combine some information into a conclusion).

(5) Evaluation, Ability to make judgments about condition, value or idea**.** Aspects of affective assessment consist of: (1) Receiving, including awareness, desire to receive stimulus, response, control and selection of external symptoms or stimuli from outside (2) Responding, a reaction given from student (3) Evaluating*:* awareness of norms acceptance, value system (4) Organization: development of norms and values within the value system organization.(5) Characterization : the formed value system affects the personality and behavior pattern. Aspects of psychomotor assessment consists of: (1) Imitate *(perception), (2)* Arranging *(manipulating)* (3) Perform by procedure *(precision)* (4) Perform well and appropriately *(articulation.)* examples of learning outcomes are skills, communication, ability to analysis, synthesis, problem solving and evaluation as well as critical and creative thinking (Anderson, H. M., Moore, D. L., Anaya, G., & Bird, E. (2005), Ewell (1985) Lizzio et al., (2002**)**

Based on data from *Education For All* (EFA) and UNESCO, Indonesia's education ranks 69th out of 127 countries. Indonesia's education index was derived from several criteria, *i.e.* primary education enrollment rate, literacy rate by 15 years old and over, participation rate by gender equality, and student survival grade up to grade V of Primary School. The decline of education quality in Indonesia is quite high. This was shown from the total of students survive in grade V measured from five years earlier. *(Global Monitoring Report : The*

*Hidden Crisis, Armed Conflict and Education. UNESCO.*2011)

The low level of education in Indonesia can be seen from the results of PISA (*Programme for International Students Assessment)* and TIMSS (*Trends in International Mathematics and Science Study*), based on the analysis of PISA test results and evaluation, Indonesia is very low. The result of 2015 survey, there was an increment in Indonesia's educational attainment, significant at 22.1 points. These results put Indonesia in fourth place in term of student achievement compared to previous survey result in 2012, from 72 nations that participated in PISA test. Indonesia's PISA score in three tested competences include reading, math and science. Trends in the field of Mathematics and Science versions (TIMSS), Indonesian students' skills are very low. Education and Culture Ministerial Regulation of the Republic of Indonesia Number 8, 2016, states that the material presentation should be interestingly arranged, easy to understand, high level of legibility, and meet the prevailing values / norms in the community.

In pre-research results, it was found that the Student Activity Sheet (LKPD) that used in Project-based learning (PjBL) is not yet implemented, PjBL Learning model is one of the models that allegedly encourage students to be active in learning.

The observation results of learning activities conducted by group IV of Seputih Agung at two schools obtained that the atmosphere of learning process were less fun and less active in the learning process. Based on the results of that observation, obtained the facts, *i.e.* a) learners are not yet conditioned to undertake group or individual learning because teachers have not yet using Student Worksheet that based on the 2013 curriculum. b) the used Student Worksheet was only contains materials and problems without accompanied activities and learning steps. c) learners who follow the learning process look passive. d) Teachers not yet using Student Worksheet media. Achievement of learners' learning outcomes who still does not meet the minimum completeness criteria (KKM) is determined, which is ≥68. The following section is the learning data results of 4th graders of elementary school in group IV of Seputih Agung:

Table 1 Result of Social Science Test of Odd Semester, Academic Year of 2016/2017 Grade IV at Public Elementary School of Gajah Mada Seputih Agung Group.

Elementary School Name	Total Students	Minimum Completeness Criteria	
		≤68	≥68
Public Elementary School 2 of Mujirahayu	30	22	8
Public Elementary School 1 of Gayau Sakti	30	20	10
Total	60	42	18
Percentage (%)	**100,00**	**70,00**	**30,00**

Source: Data of Uptd Seputih Agung sub-district
Lampung Tengah

Based on the above table, learners who scored above the minimum completeness criteria (KKM) with a score of >68 for Elementary School 2 of Mujirahayu are 8 students, Elementary School 1 of Gayau Sakti are 9 students or total of 36,17%. And students who scored below the minimum completeness criteria (KKM) with a score of <68 for Elementary School 2 of Mujirahayu are 16 students, Elementary School 1 of Gayau sakti are 14 students, or total 30 students or total of 63.83%. This shows a relatively low student learning outcome. This situation if not immediately fixed up, it will be bad for students. Therefore, researcher was interested to provide a solution by developing a Student Worksheet with PjBL based.

The success of a learning model is influenced by teacher's ability in the learning process. Based on an observation with 6 elementary school teachers in Seputih Agung sub district, it was identified that some teachers in those 6 schools have already familiar with PjBL because they have attended K-13 training, but the implementation is not maximal yet.

The thematic learning substance, an integrated curriculum that embraced by the 2013 curriculum, interacts with the environment. Learning should be active, creative and fun. This learning process is directed to the three pillars of learning process, *i.e. learning to know*, *learning to do, learning to be, and learning to live together* by using teaching materials with PjBL model.

The Student Worksheet developed by researcher was integrated with a learning model that helps to facilitate learners to understanding the material. The learning model that chosen in this Student Worksheet development is Project Based Learning.

Based on the above description, the purpose of the research is the realization of Student Worksheet development based on PjBL model, and to know the learning result difference between students who using Student Worksheet PjBL based model and students who learning using textbook material, at Public Elementary School 2 of Mujirahayu, Central Lampung.

METHOD

The research method used was developmental research (*Research and Development)* using the research steps according to Borg and Gall (1979:624) which consists of 1) research and early information gathering, 2)

planning, 3) development of initial product format, 4) preliminary trial, 5) product revision, 6) field trial, 7) product revision, 8) field trial, 9) final product revision, and 10) dissimination and implementation.

Research Population
population of the research that author conducted was all 4th grader students of Public Elementary School of Imam Bonjol Group, Academic Year of 2017/2018 with total of 160 students

Research Sample
Samples were chosen by *multi stage random sampling* technique. That elects 4th grader students at Public Elementary School 1 of Gayau Sakti with total of 30 students as experimental class and 4th grader students at Public Elementary School 2 of Mujirahayu with total of 30 students as control class. The 4th grade students at Public Elementary School 1 of Mujirahayu with total of 28 students as learning result assessment instrument test.

Table 3.3 Research Sample of Class IV, Academic Year of 2017/2018

School	Sample	Information
Public Elementary School 1 of Mujirahayu	28	Instrument trial
Public Elementary School 1 of Gayau Sakti	30	Experimental class
Public Elementary School 2 of Mujirahayu	30	Control class
Total	68	

Source: Data of class IV students at Public Elementary School of Seputih Agung 2017/2018

Data Collection Technique
Data collection techniques that used in this research are techniques of (1) needs analysis questionnaire (2) documentation (3) observation (4) expert validation sheets (5) test.

Data Analysis Technique
Data Analysis Techniques that used in this research are (1) Validity test (2) Reliability (3) Difficuty level (4) distinguishing power.

RESEARCH RESULT AND DISCUSSION
Research Results
Initial Information Gathering, initial information gathering was obtained through a survey to analyze teacher's needs for project based learning Student Worksheet using questionnaires. Furthermore, also to determines the level of need for the developed product.
Planning and Needs Analysis, The planning of Student Worksheet development based on *project based learning* at class IV of Public Elementary School 1 of Gayau Sakti with activities such as teacher needs analysis and student needs analysis. **The Development of Prototype Format of Student Worksheet based on *Project Based Learning*,** the development of Student Worksheet based on *project based learning* at class IV of Public Elementary School 1 of Gayau Sakti, Seputih Agung sub district, with expectations to (1) conduct curriculum analysis (2) designing a test learning device in form of *project based learning* Student Worksheet, and (3) Evaluation device.
Initial Product Trial, Initial field trial were conducted by experts, it aims to make the produced product in form of Student Worksheet can be used by students. This internal test consists of tests from material expert, media expert and 4th grader teachers (a) Material Expert test aims to gain suggestion about the suitability and the truthness of the prepared instructional materials based on its science (b) Media Expert test aims to gain suggestion about the accuracy of the Student Worksheet design (c) 4th grader teachers validation aims to know advantages and disadvantages of the developed product. **Product Revision,** based on the initial product trial results and suggestions from subject material expert, then researcher conducting product revision. The results of revision are (a) Improves the student worksheet's cover page appearance by observing the appropriate image, correction was made by replacing the worksheet's front cover with images that suitable to the developed material. (b) The images used should have clear reference sources and real images and also in line with *project based learning* steps. This correction aims to enable students to find their own examples of other images from the referenced image (c) Replace previous images with more interesting images. Correction was made by researcher, by replacing the previously displayed images with better images, so that students can observe the image more clearly (d) Improve the introduction page on layout of learning indicators
Field Trial (Step 1) This preliminary trial was performed after the teaching materials were declared eligible by the material expert, then teaching materials can be implemented or used in learning activities. Trial of the student worksheet product was conducted in three class IV teachers, *i.e.* Public Elementary School 1 of Mujirahayu, Public Elementary School 2 of Mujirahayu and Public Elementary School 3 of Mujirahayu. **Product Revision,**

based on the results of the student worksheet *project based learning* trial in a small group, majority of student states that student worksheet based on *project based learning* was very effective, there are increment in students' Social Science learning outcomes after learning using the *project based learning* student worksheet.

Field Trial (Step 2), on the second phase of field trial, testing was conducted to the teachers to test the product after using *project based learning* student worksheet. The trial of this product was conducted with a broader target or larger scale with six elementary schools (Elementary School 1 of Gayau Sakti, Elementary School 2 of Gayau Sakti, Elementary School 3 of Gayau Sakti, Elementary School 1 of Mujirahayu, Elementary School 2 of Mujirahayu, and Elementary School 3 of Mujirahayu. **Final Product Revision,** final product revision was conducted based on the hypothesis test results and findings in the field when the product was tested. Based on the conducted hypothesis testing result, obtained an increased learning result, so it can be concluded that the student worksheet with *project based learning* was not revised, and feasible to be implemented.

Implementation, At this implementation phase, testing was conducted to test learning outcomes after using the student worksheet with project based learning. Testing was conducted in two schools namely Experimental class (Public Elementary School 1 of Gayau Sakti) and Control class (Public Elementary School 2 of Mujirahayu). The purpose of this implementation is to determine whether the developed product has shown performances as defined criteria or not. Sample in large group is 4th grader students at Elementary School 1 of Gayau Sakti with total of 30 students as the experimental class and 4th grader students at Public Elementary School 2 of Mujirahayu from 22nd-27th January 2018, whilst on step 2, in 4th grader students at Public Elementary School 1 of Gayau Sakti from 20th-26th February 2018.

Discussion

First Trial Result

Based on the validation results of material expert and media expert, it can be concluded that the development of the student worksheet with project based learning has been successfully realized and can be used for next step of the research. Therefore, the first hypothesis in this research is: The realization of the development of the Student Worksheet based on *project based learning*, tested in real.

Second Trial Result

Experiment step of the experimental class large group at class IV of Elementary School 1 of Gayau Sakti showed that students' social science subject learning results after using the student worksheet based on *project based learning* were obtained an average gain of 0.49, it was included in medium category.

Control class learning results on social science subject at class IV of Elementary School 2 of Mujirahayu, showed that the students' learning results of social science subject based on test result before using the *project based learning* student worksheet were obtained an average gain of 0,20, it was included in low category. This explains that student worksheet based on *project based learning*, especially in social science subject, the student worksheet with *project based learning* can increase the students' learning results. As shown in the following data.

Data of Learning outcome	Elementary School 1 of Gayau Sakti	Elementary School 2 of Mujirahayu	Score Difference
	Experimental Class	Control Class	
N	30	30	0
Mean	79,17	72,17	7
Median	75,00	60,00	15
Mode	70	70	0
Minimum	65	55	10
Maximum	95	90	5
Total	2375	1845	530

Source: Result of data processed by
SPSS version 2017

Based on above data, it was shown that the average leaning result of social science subject that using the student worksheet based on *project based learning,* namely Elementary School 1 of Gayau Sakti with score of 75, compared to the average learning result of social science subject that not using the *project based learning* student worksheet with score only 60. This showed that the usage of the student worksheet based on *project based learning* in social science subject at class IV was much better result compared to using lecture model.

Test of the student worksheet development based on *project based learning* to improve the social science learning result of 4th grader students at Elementary School 1 of Gayau Sakti, was conducted to test the hypothesis of t test two samples independent technique with the following results:

School	T_{count}	t_{table}	Criteria
Elementary School 1 of Gayau Sakti and Elementary School 2 of Mujirahayu	2,76	1,69	Ho rejected

Source: Result of data processed by independent two samples technique

The results of the hypothesis analysis states that there are differences in learning results between the one who using the student worksheet based on *project based learning* and the one who are not using the student worksheet based on *project based learning* by the *t* test two samples *independent* result at classes IV of Elementary Schools. *t* count score is 2,76, whilst *t* table score is 1,69. This showed that t count score was greater than t table, which means that the proposed hypotesis can be accepted, there are differences in social science subject learning results between the one who use the student worksheet based on *project based learning* at Elementary School 1 of Gayau Sakti and social science learning results of the one who are not using the student worksheet based on *project based learning* at Elementary School 2 of Mujirahayu.

Development of Student Worksheet based on *Project Based Learning* on class IV of Public Elementary School ofSeputih Agung Group

Some opinions suggest that the steps of *project based learning* model have several variation although the basic principle is not much different from each other. According to the Ministry of education and culture (2013:11), *i.e.* (1) deliver the conducted project, (2) organize learners, (3) help learners to extract the necessary information, (4) formulate the results of project work, (5) present the results of project work. This opinion was also stated by Majid (2013:62) that detailed steps for designing *project based learning* such as (a) Teachers and learners together select a topic for study, taking into account about curriculum standards, local resources, and learners' interest. (b) Teachers should find out what the learners have understood and helps him to develop the questions that will be explored later. (c) Teachers provide learning resources for learners as well as opportunities to study in the field. (d) Learners share experiences and outcomes among them, then each learner reports his research results and, eventually, participate in the project evaluation process. However, the development of *project based learning* student worksheet was adjusted to the steps of the learning model proposed by The ministry of education and culture (*kemendikbud*) because it is easier to suit the characteristics and needs of the students, especially the characteristics of 4th grader student at Elementary School 1 of Gayau Sakti.

The results of this study can empirically strengthen the results of similar research conducted by other researchers such as, **first,** According to Jagantara (2014:112) in *e-Journal* of Ganesha University of Education Postgraduate Program, the learning steps of *project based learning* that can improves students' learning outcome such as (1) throw an essential question to students, (2) Designs a project plan, (3) arranges an activities schedule, (4) monitors student's activities, (5) evaluate student success, and (6) evaluate student's experience. **Second**, this research result was relevant with Houng Ho Ngo (2014:2) in *International Journal of English Language Education* that the characteristics of *project based learning* are: (1) Project-based learning comes from educational philosophy of emphasizing student center learning. (2) Project-based learning supports cooperative learning through communication, information exchange, knowledge, and opinion among learners. (3) Project-based learning allows students to make a product which demonstrate that students have been successfully acquired knowledge.

Difference of Learning Result between user of *Project Based Learning* Student Worksheet and Non user of *Project Based Learning* Student Worksheet

Based on hypothesis testing results by using t test two samples *independent* technique, obtained results that thematic learning results of students who are using the student worksheet based on *project based learning* were higher compared to students who are not using the student worksheet based on *project based learning*. Thematic learning results of 4th grader students from Elementary School 1 of Gayau Sakti were higher than 4th grader students from Elementary School 2 of Mujirahayu. Therefore, based on hypothesis test, null hypothesis (Ho) was rejected and alternative hypothesis (Ha) was accepted, means "There are thematic learning results difference between students who are using *project based learning* student worksheet and thematic learning results of students who are not using *project based learning* student worksheet." This means that the better use of student worksheet based on *project based learning* will increase student learning outcomes. Hypothesis result test was at once proved that the hypothesis that states 4th grader students' thematic learning results of Public Elementary School 1 of Gayau Sakti, Seputih Agung sub district, was accepted. Because after using the student worksheet based on *project based learning,* the students' thematic learning results are getting better. This proves that the more frequent the use of student worksheet based on *project based learning,* the better the improvement of students' learning result.

The results are in accordance with Rudi and Joko's Research (2015:783) in Electro Engineering Journal of Surabaya National University, found that the average score of students' learning outcomes differed or improved after using *project based learning* model. And also the average posttest score is 81,50 with standard deviation of 5,364 and the average pretest score is 44,14 with standard deviation of 6,217. This proved that there are differences in average learning score between *pretest* and *posttest.* After knowing differences in learning outcomes, then determines t count score to be compared with t table score, from those results, obtained t count score of 20,035 and t table score of 1,67. Based on t-test criteria which is H0 if t count ≥ t table.

Jagantara's research (2014:110) in e-Journal of Ganesha University of Education Postgraduate Program, found that average Gain score between group of learning models are X=0,79,SD=0,11 with high category for experimental group or students learning with project-based learning model and X=0,46,SD=0,10 with medium category for control group or students learning with direct learning model. This result showed that the average gain score of the experimental group was higher than the control group. Descriptively, this result indicates that the students are taught by direct learning model quantitatively.

It also relevant with Pramukantoro's research (2013:737) in Electronical Engineering Journal of Surabaya National University, found that the post-test data calculation shows the average learning score of experimental class is 74,88, whilst the average learning score of control class is 57,14. The average learning score of the experimental class was higher than the control class. Based on *t-test independent* analysis, with t score of 0,975 and dk=34, obtained *t* count score of 19,3, whilst t table score is 2,04 because t count > t table. So that H_0 was rejected and H_1 was accepted. So it was concluded that there is influence of project-based learning method to student learning outcomes on competency standard of apply the basics of digital techniques at Public Vocational High School 2 of Surabaya.

Finally, it can be concluded that the development of teaching material, particulary the student worksheet based on *project based learning* in this research can be relevant for teachers to improve learning activities to be more active, creative, and innovative using learning model that in line with the implementation of the 2013 curriculum to improve students' learning outcome. It should be considered that the development of student worksheet is more effective with six themes on a particular sub theme, so in one theme, the teacher should develop six thematic lessons on each theme.

Characteristics of results and research findings about the development of *project based learning* based learning materials (1) The content materials of student worksheet based on *project based learning* should be suitable with the 2013 curriculum and suitable with the students' need. (2) In student worksheet based on *project based learning,* the presentation of the subject material develops the students' potential to discover and build their own understanding of the material, besides it is equipped with images that empower students' knowledge. (3) Student worksheet based on *project based learning* allowing students to study independently, which means that students can learn anywhere and do not depends on the teacher's present in face-to-face class.

School's characteristics are also a consideration in developing *project based learning* student worksheet. The developed student worksheet can be used in the same elementary school like the experimental elementary school, namely Elementary School of Gayau Sakti.

Advantages of the Development of Student Worksheet based on *Project Based Learning*

Based on the results and research findings, there are several advantages in the research development of *project based learning* teaching material with *project based learning* model, *i.e.* (1) The contents of the student worksheet based on *project based learning* are suitable to 2013 curriculum and suitable with students' need. (2) In student worksheet based on *project based learning*, the presentation of the subject material develops the student's potential to discover and build his own understanding of the material, besides it is equipped with images that empower students' knowledge. (3) Student worksheet based on *project based learning* allowing students to study independently, which means that students can learn anywhere and do not depends on the teacher's present in face-to-face class.

Limitations of the Development of Student Worksheet based on *Project Based Learning*

Some limitations in the development of student worksheet based on *project based learning* model, *i.e.*: (1) Student worksheet based on *project based learning* only presented one sub-theme of one theme, not covering the whole theme in the even semester. (2) Testing and learning outcomes using student worksheet based on *project based learning* was only conducted in one school.

CONCLUSION

Based on the result of the research development of Student Worksheet based on *Project Based learning*, it can be concluded as follows: (1) the created product in this research is development of a student worksheet based on PjBL model using R&D model from Brog and Gall in accordance to the need analysis and the research development steps. The development of the student worksheet based on PjBL model was adjusted to the steps of PjBL learning model such as (a) organize learners to learn, (b) deliver the conducted project, (c) help learners to extract the necessary information, (d) formulate the results of project work, (e) present the results of project work. (2) There are learning outcomes difference between learners who are using student worksheet based on PjBL model and learners who are using conventional learning material on 4th grader learners from Elementary School 2 of Mujirahayu

REFERENCES

Anderson, H. M., Moore, D. L., Anaya, G., & Bird, E. (2005*). Student learning outcomes assessment: a component of program assessment. American Journal of Pharmaceutical Education*, *69*(2), 256-268

Abidin, Yunus. 2014. Desain Sistem Pembelajaran dalam Konteks Kurikulum 2013.Refika Aditama. Bandung

Borg, D. Walter, Joyce P. Gall and Meredith D. Gall. 1979. *Educational Research an Introduction*. Perason Education, Inc. Boston

Depdiknas. 2008. *Panduan Pengembangan Bahan Ajar*. Depdiknas: Jakarta

Ewell,P.T.1985. *Assessing educational outcomes. New directions for institutional research,* San Francisco: Jossey-Bass.

Guo,Shaoqing and Yang,Yanjun.2012.*Project-Based Learning: an Effective Approach to Link Teacher Professional Development and Students Learning. Journal of Educational Technology Development and Exchange (JETDE)*: Vol. 5 : Iss. 2 , Article 5.

Jagantara, Made Wirasana. 2014. *Pengaruh Model Pembelajaran Berbasis Proyek (Project Based Learning)* Terhadap Hasil Belajar Biologi Ditinjau dari Gaya Belajar Siswa Belajar Siswa SMA. *E-Journal Program Pascasarjana Universitas Pendidikan Ganesha Program studi IPA, Vol. 4, Hal 11.*

Kemendikbud. 2013. *Modul Pelatihan Implementasi Kurikulum 2013*. Jakarta. Kemendikbud.

Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher Education*, *27*(1), 27-52.

Majid, A. 2012. *Perencanaan Pembelajaran Mengembangkan Standar Kompetensi Guru.* PT. Remaja Rosdakarya. Bandung

Monchai Tiantong.2013. The Online Project-based Learning Model Based on Student's Multiple Intelligence: *International Journal of Humanities and Social Science:3*

Lee, Che-Di. 2014. Worksheet Usage, Reading Achievement, Classes' Lack of Readiness, and Science Achievement: *A Cross-Country Comparison, International Journal of Education in Mathematics, Science and Technology National Taiwan Normal University,* Volume 2, Number 2, April 2014, Page 96-106 ISSN: 2147-611X, (Akses Tanggal: 03 Juni 2017. Pukul: 10.57 WIB.)

Prastowo, Andi. 2011. *Panduan Kreatif Membuat Bahan Ajar Inovatif.* Diva Press. Yogyakarta.

Rudi dan Joko. 2015. *Penerapan Model Pembelajaran Berbasis Proyek Untuk Meningkatkan Hasil Belajar Mahasiswa Pada Mata Kuliah Pemeliharaan Dan Perbaikan Motor Listrik*. Jurnal Pendidikan Teknik Elektro. Volume 03 No 04

Sumalee Siksen Fakultas Sains dan Teknologi Nakhon Pathom Rajabhat University 85 Malaiman Road, Muang, Nakhon Pathom 73000. 2013. *The Online Project-based Learning Model Based on Student's Multiple Intelligence.* Vol. 3 no 7.Thailand

Wahyu Islamul Hayati dan I Komang Astina.2016. *Efektivitas Student Worksheet Berbasis Project Based Learning Dalam Menumbuhkan Kemampuan Berpikir Kritis Siswa Pada Mata Pelajaran Geografi*. Jurnal Pendidikan: *Teori, Penelitian, dan Pengembangan* Volume: 1 Nomor: 3 Bulan.Halaman: 468—474. EISSN: 2502-471X

Pramukantoro, Much.Farid.2013. Pengaruh Penerapan Pembelajaran Berbasis Proyek Terhadap Hasil Belajar Peserta Didik Pada Standar Kompetensi Menerapkan Dasar-Dasar Teknik Digital Di SMK N 2 Surabaya, Jurnal Pendidikan Teknik Elektro Universitas Negeri Surabaya Volume 02 Nomor 02,hal 737-743

Yildirim, N., Kurt, S,& Ayas, A.2011. The Effect of The Worksheet on Student's Achievement in Cheminal Equilibrium. *Journal of Turkish Science Education.* Vol.8(3): 44-58 pp, (Akses Tanggal 20 Oktober 2016. Pukul :19.00 WIB).