World Journal of Engineering Research and Technology
WJERT
www.wjert.org
SJIF Impact Factor: 5.218

PHYSICS LEARNING MEDIA DEVELOPMENT BY APPLYING LESSON STUDY TO IMPROVE THE YUNIOR HIGH SCHOOL STUDENTS' ACHIEVEMENT OF PHYSICS IN THE REGENCY OF NORTH MINAHASA

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Article Received on 22/07/2018 **Article Revised on 12/08/2018** **Article Accepted on 02/09/2018**

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ABSTRACT

This research aims to develop media learning Physics by applying the lesson study which is practical and effective way to improve the students achievement of physics. These learning media development refers to the development of Dick and Carey model with the phases of the determination of subjects, needs analysis, Physics, learning media development and tryout of learning media. Learning media is a developed media of Wave Optics Physics learning material by applying a lesson study pattern consisting of a Plan, do and see. This research uses the draft study one group pre-test post- test design and The trials-t party to the right test of hypothesis. The results showed that:[1] the use of the media learning Physics wave-optical materials meets the category of valid,[2] the media learning Physics meets the category of practical,[3] test results on the effectiveness of the media learning Physics shows that there is an increase of the students' achievement. The students' achievement of physics with Physics learning media use of lesson study pattern is better than the students achievement of physics before using media learning physics with lesson study pattern. It comes into conclusion that the media learning Physics using lesson study pattern of the optical wave material development is effective in improving the Yunior High School students achievement of physics.

KEYWORDS: Learning Media Development, Learning Physics Achievement.

I. INTRODUCTION

An inquiry-based science education is becoming a common teaching paradigm all over the world at both primary and secondary school. Unfortunately, except for some notable experiences of inquiry-based instruction, such as the Workshop Physics, Real-Time Physics, Interactive Lecture Demonstrations, and Conceptual Labs, this is generally hardly happening at university, where most scientific disciplines are still taught by following a lecture- based method of instruction. In some cases, this might be due to greater numbers of students attending a university course, limiting the possibility to engage them within an inquiry-based learning environment in real laboratories (Dominique Persano Adorno, Nicola Pizzolato, and Claudio Fazio 2018: 14).

The Regency of Minahasa in North-is one of the counties who are trying to continue to restructure themselves to go ahead. The progress that can be achieved, among others, determined by the quality of human resources. Improving the quality of human resources can be reached through a process of education. Formal education is very supportive of the achievement of the quality of human resources. The success of many formal education lies in teachers. Therefore the improvement of the quality of teachers need to continue to follow the pace of the development of science and technology. Teachers of Sciences in the Regency of Minahasa in North this time is trying to continually develop themselves, both in terms of the learning process, which since 2009 till now is establish programs lesson study LPTK JICA and cooperates with. For the preparation of the instrument Mastery Learning the teachers really need training and guidance of mentoring from UNIMA Science Faculty. UNIMA has sufficient human resources to help deliver quality performance improvement mentoring guidance teachers of Sciences. Good for the enhancement of quality in the field of research, study materials, learning, evaluation and modivicate media or learning tool. Learning media use can stimulate thinking creativitate students in learning.

Creative thinking skills are skills that include: thinking skills, flexible thinking skills, rational thinking skills, skills or elaborate on detail, and evaluating skills (Munandar, 1992); While the process of skills is the overall directional scientific skills (cognitive or psychomotor) that can be used to find a concept or principle or theory, to develop a concept that had been there before, or to perform denial of an invention (Trianto, 2014).

Shove off from the problem above, researchers interested in developing instructional media with patterns lesson study to improve the results studied physics and creative thinking skills of students, which refers to the development model according to Dick and Carey (1990), the steps are: 1) the determination of subjects, 2) needs analysis, instructional media development) 3, and 4) review/test device learning. Media learning Physics by using patterns lesson study that will be developed is a practical Guide which contains material, the answer to question on the book students, syllabus, RPP, is LKS, his assessment on the material of the wave and optical devices.

The objectives to be achieved from the study:[1] find out the validity of the media learning physics with a pattern of lesson study,[2] know the practicality of the media learning physics with a pattern of lesson study,[3] knowing the effectiveness of media Physics learning with patterns lesson study to improve the results of your creative thinking skills studied physics students.

1. The Concept of Lesson Study

Lesson Study as one of the models of the construction professions educators through the study of collaborative learning and sustainable based on the principles of mutual learning and kolegalitas to build a learning community. (Slamet Muljana, 2007:4). Lesson study is not a method or learning strategies but activities lesson study can apply various methods and strategies of learning that suits the situation, conditions, and issues facing teachers. Lesson study is carried out in three stages, namely plan (plan), do (implement) and see (reflection). In other words lesson study is a way of increasing the quality of education that never ended (continous improvement) (Hendrayana Sumar, et.al. 2006:10).

Learning activities lesson study is one form of learning activities ranging from the design of early learning activities, implementation up to the end of the learning activity i.e. learning reflection. Learning activities lesson study work patterns form a team of lecturers together that allows adding insight between professors to build better learning performance. Excellence always happens on learning activities lesson study is how the initiators attempted to observe student learning activities. On the activities of the lesson study of the students observed the activity of learning changes the time of lectures, so hopefully there isn't a student who does not note their learning activities during the lecture. Recording or recording learning activities students become accurate data when doing a reflection after completion of the learning activity. The advantage of learning activities lesson study is always the end of

learning activities undertaken reflection learning activities completed are followed. Excellence learning activities lesson study is always terminated with a shared reflection over the newly completed learning activities followed. Reflections always produce how the following lectures better than today (Ferdy Dungus, 2013:12).

Understanding of lesson study is a model of the coaching profession of educators through the study of collaborative learning and sustainable based on the principles of mutual learning and kolegalitas to build a learning community. Thus, lesson study is not a method or learning strategies but activities lesson study can apply various methods and strategies of learning that suits the situation, conditions, and issues facing teachers. Lesson Study is carried out in three stages, namely Plan (plan), Do (implement), and See (reflection). Lesson study is a way of increasing the quality of education that never ended (continuous improvement) (Muchtar Abdul Karim 2007:3). The process of discussion in lesson study is submission of the results of observation of the observer, which focus on the activity of students. Suggestions and criticism of the process kegitan lesson study should depart from student behavior in the classroom, or in other words that all suggestions for refinement at the next stage should be based on data and facts that happened in the classroom (Sumar Hendrayana, et al. 2006:9).

Lesson Study is an activity that can encourage the formation of a community learning (learning society) are consistently and systematically committing self improvement, both on an individual level or managerial. Formulation of Lesson Study as one of the models of the construction professions educators through the study of collaborative learning and sustainable based on the principle of psrinsip-kolegalitas and mutual learning to build a learning community (Slamet Muljana, 2007:5).

2. Physics and Physics Learning

Physics is a science that studies the aim components of matter and of mutual inter-action. Through the use of this energy inter-action understanding scientists explain the nature of matter in an object, as a symptom of other nature which we observe. At first the source of information scientists are her senses, senses and therefore scientists classify symptoms are observed in accordance with the observations of the way through the five senses.

Natural light covers symptoms associated with vision and optics to develop as a science that a little or a lot do not rely on this behavior. The sound associated with the hearing, acoustics developed as a science that deals with it. Heat related to the physical senses, and over the

years the study of heat (thermodynamics) is a branch of physics other autonomous. Motion of course is the most common of symptoms observed nature directly, developing early mechanics from other branches of Physics (Alonso, Marcelano and Finn, J. Edward 1992:2).

According to Sears Physics is a science about measurement (measurement science) (Francis w. Sears. and Mark w. Zemansky 1987:1). Understanding physics is also delivered by Tipler that Physics is associated with matter and energy with the laws that regulate the movement of particles and waves, interactions between particles, sitaf properties of molecules, atoms and nuclei, and with the system larger scale such as gas, liquid and solid (Tipler James 1998:1).

The main constituent of physics are physical quantities which are used to declare the laws of Physics for example: length, mass, time, force, speed, meetings (density), relativity, temperature, light intensity, and many more of the other (David Halliday and Robert Resnick. 1997:3). So the reason all the branches of the natural sciences (physics, chemistry and biology) rely on laboratory experiments. Students studying natural sciences based on experimentation. So the approach of learning to do in laboratory experiments to improve learning. (Mehmet Erkol, Mustafa Kisoglu, and Erdogan Buyukkasap 2010:2310-2314). The process of physical education students should look in order for consciousness physics grown not only as an academic activity, but rather as a way to understand the world in which human life (Mundilarto, 2002:5).

It is also obtained from the research of Smarabawa, et al. (2013), with the result there is difference of understanding of biology and creative thinking skills among groups of students who learn by learning technology science community and students who learn learning model directly. STM learning model focused on the six domains of science, namely: domain domain concepts, process, application domain and domain relationships, creativity, attitude, and domain domain world view (Yager, 1996). Domain creativity is the result of creative thinking skills, and skills related to process domain process. Funk (1979) the science process skills are divided into two levels, namely basic process skills (basic science process skill) and integrated process skills (integrated science process skill). Process skills in the primary grades include: observe, classify, communicate, measure, predict, and making inference; While the integrated process skills include: determining the variables, compiling a table of data, drawing up the charts, giving the relationship of variables, processes the data, analyzing the investigation, drawing up hypotheses, determine which variables are operational,

planning investigation, and conduct experiments. For junior level, science process skills are generally drilled in students science process skills are a basic level.

Sukardi (2012). Related research results where research using laboratory group of real and virtual laboratory group. The results showed that there is a problem-based learning, influence through experiments with real and virtual laboratories towards achievement of learning. There is the influence of learning achievement against learning style, and there is no interaction between problem-based learning through experimentation with real and virtual laboratory with learning achievement against learning style, there is interaction.

Naba Hamida (2013). The results of the research show that there are influences learning method using virtual labs and STAD, STAD use real lab against the achievements of the student learning material on the cognitive aspects of colloidal systems and there is no influence the learning method using virtual labs and STAD, STAD using real laboratory on affective achievement. There is the influence of student's creativity high and low learning achievement of students against the material of cognitive aspects of either colloid or affective. There is no interaction between the learning method using virtual labs and STAD laboratory student creativity with real high and low learning achievement of students against the material of cognitive aspects of either colloid or affective.

Benefit from teachers who generate new knowledge about the curriculum and teaching through the design team has been confirmed by our research. Our research indicates that the professional development, in the form of design collaboration within teams, specific and related to the curriculum, the influence of teacher knowledge and practice and the impact of the implementation of the curriculum reform (Joke M. Voogta, Jules M. Pietersb and Adam Handelzaltsc. 2016:121–140).

Improve the skills of creative thinking and problem solving are scientific, developing skills in the field of ICT without neglecting knowledge about the laboratory, did not have to incur the actual practical equipment, which sometimes the price is not affordable, and practical work can be done when only (Putri, 2013:2). Yuniarti, et al.(2012:3) in his research stating that the virtual laboratory is cheaper, safe and suitable use by students who have a visual learning style because students can explore virtual laboratory according speed and his needs.

Our findings have strong implications for teaching and learning physics secondary school in Nigeria use computer supported cooperative learning the relative effectiveness of Computer Supported learning strategies: 90 strategy. Our results suggest the computer assisted instruction in ' Cooperative learning ' setting rather than in the individual ambience. In addition, our results suggest that expose students to computer supported Cooperative learning strategies may improve the performance of students in physics as well as their attitude towards the subject. Amosa Isiaka Gambari and Mudasiru Olalere Joseph (2016:89-90). The practice of continuous scientific inquiry process seems necessary to maintain or enhance the ability of reasoning needed to achieve a more meaningful conceptual understanding of the underlying physics of natural phenomena. (Dominique Persano Adorno, Nicola Pizzolato, and Claudio Fazio, 2018:9)

II. RESEARCH METHODS

Learning media development applying Physics lesson study refers to a model of development according to Dick and Carey, which consists of four stages, namely: phase determination of subjects, needs analysis stage, the stage of learning, and media development stage review/test of learning media device. Learning media being developed is a medium of learning physics with lesson study consisting of: Designing instructional media material wave-optical Physics, experimental guidelines or tutorial experiment and experiment activities assessment process using performance assessment.

The stage setting of subjects is done by selecting the subjects along with subject matter that fits the pattern of learning lesson study which will be developed, based on the considerations, among others: the characteristics of the material, the allocation of time, Division of material in the semester and year programs.

Needs analysis phase includes the following things, namely: 1) analyze curriculum related to learning Physics in Junior High School class IX; 2) inventory materials in schools and learning resources that are in the environment outside the school; 3) disseminate a questionnaire to teachers of Junior High School in order to get data on how to teach the teacher, learning approaches that are used frequently, strategy/model of learning that are frequently used, methods of learning are often used, the textbook used, and constraints often encountered in learning physics, then analyse it; 4) analyzing the books or materials physics used in class IX Junior High School; 5) examines the concepts of physics that could be related to real-world students. At this stage of the development of the learning media do the

following things, namely: identifying, analyzing Basic Competency curriculum, identifying the behavior and characteristics of students, formulate the Basic Competencies and indicators of results Learn, develop assessment instruments, developing learning strategies, compile the draft Handbook of teacher and Student Books.

Stage review/learning media trials conducted to know the quality of the media learning, both in terms of validity, practicality, and effectiveness. Trials carried out in four stages, namely, an assessment of the feasibility of a draft I by 2 people expert (expert) and 2 teachers (practitioners) through Reflection generates drafts drafts, validation II II by 8 men teachers (validator) produces draft III, a test of individual draft III generate draft IV, a small group of test draft IV to produce the media learning Physics settings valid study and practical lesson, and then tested its effectiveness.

Physics learning media produced must meet the quality good, learning media includes: the validity, practicality, and effectiveness. Test the validity of the data collected by learning device using sheet validation syllabus, RPP, is LKS, materials/books, and evaluation tools. Test results validation by the validator by using sheets of validation of differentiated into four categories as presented by Table 1.

Table 1: The criterion validity of the device.

No.	Score learning	Criteria
1	$3,5 \leq SR \leq 4,0$	Very valid
2	$2,5 \leq SR \leq 3,5$	Valid
3	$1,5 \leq SR \leq 2,5$	Is invalid
4	$1,0 \leq SR \leq 1,5$	Is not valid

Practicability test data collected with the learning media device using the now the response of teachers and students, as well as the observation sheet. The practicability of learning media test results differentiated into four categories as presented in Table 2.

Table 2: The Criteria of Practicality Media learning.

No.	Score Criteria	Criteria
1	$3,5 \leq SR \leq 4,0$	Very practical
2	$2,5 \leq SR \leq 3,5$	Practical
3	$1,5 \leq SR \leq 2,5$	Impractical
4	$1,0 \leq SR \leq 1,5$	Is not very Practical

Test the effectiveness of media Physics learning patterns lesson study was conducted with limited field test by applying a learning device in class IX Junior in the Regency of Minahasa

in North Sulawesi North. This research was carried out with the design of the study one group pre test post test design. The effectiveness of this test carried out using the process of science skills tests and tests the skills of creative thinking. To know the science process skills improvement and creative thinking skills of students before and after the learning is done with consideration of the results of calculation of gain score normalization. Normalization score gain (g) is a suitable method for analyzing the results of pre-and post test-test (Hake, 1999).

To find out if the process of science skills and creative thinking skills of students after learning better than before learning, used test-t party to the right. Right-party test used in the zero hypothesis (H_0) reads less than or equal to (≤) and an alternative hypothesis (H_1) reads (>) (Sugiyono, 2013). Prior to the test-t parties right, first performed a test of normality to convince data actually Gaussian. Test of normality distribution of data is done using the Kolmogorov-Smirnov Test statistics and the Shapiro-Wilk Test (Candiasa, 2004).

III. RESULTS AND DISCUSSION

Based on the development process in accordance with the stages of development are planned including a test of the validity of the media learning Physics with patterns lesson study developed, acquired media components that the device Physics learning patterns lesson the study developed a physics experiment: the media i.e., RPP, assessment instruments, LKS AS the success of the study gained an average score of (SR) of 4.59, where SR is 4.5 range ≤ SR ≤ 5.0, so including the very valid category which means very feasible for use in learning.

Tally the results of the validation of the media learning Physics pattern lesson study developed for each component such as presented in Table 3 below.

Table 3: The results of the validation of the media learning patterns lesson study developed for the each component.

No.	Components	SR	Category
1	Media Study	4,62	Very valid
2	RPP	4,72	Very valid
3	Student Worksheet	4,54	Very valid
4	Assessment Instruments	4,30	Valid
5	The Instructions Practical	4,66	Very valid
	The Mean Total Score	4,59	Very Valid

Media device Physics learning patterns lesson study developed it can achieve very valid categories because the following things, namely: learning media, RPP, is LKS, instrument rating, Manual practicum has been very clear activities, so it's already worthy of use in learning; Physics learning media devices developed using the model of development of learning according to Dick and Carey who systematically; device Physics learning developed this already meets the validity of the content and validity of invalid constructs a product development; using a model Lesson study which is one of the learning models that collaborative constructivist in nature, which has advantages in comparison to other learning model, which in this Physics learning media device, using lesson study pattern where processed collaboratively ranging from Plan, do and see. in beginning lessons help students build their own knowledge.

Practicability test results against instructional media device Physics lesson study pattern developed, by now the response of teachers and teacher observation sheet, obtained an average score of (SR) amounted to 4.56, where these values are in the range of $4.5 \leq SR \leq 5.0$ so that categories include very practical. Test results the practicability of learning media device Physics lesson study developed patterns obtained through the now response sheet teacher and observations presented in Table 4 below.

Table 4: Test results the practicability of learning Physics media device developed via the question form the response of teachers and the observation sheet

No	Components	SR	Category
1	Response against the execution of teacher learning	4,52	Very Practical
2	Application of process media teacher response learning	4,59	Very Practical
3	Teacher observation application process each meeting	4,56	Very Practical
	The mean total score	4,56	Very Practical

Further test results from the practicality of Physics learning media software patterns lesson study developed, through individual trials and trial group, obtained an average score of (SR) of 4.65, where these values are in the range SR ≤ 4.5 5.0 so that the categories include very practical. Test results the practicability of learning media device Physics lesson study developed patterns obtained through trials of individuals and small groups of trials is presented in Table 5 below.

Table 5: The results of the test the practicality of the device learning Physics developed/ results student response

No	Components	SR	Category
1	Individual Test	4,70	Very Practical
2	A small group of test	4,61	Very Practical
	The mean total score	4,65	Very Practical

Media device Physics learning patterns lesson study developed it can reach the category of very practical due to the following matters, namely: learning media device Physics lesson study patterns it empowers all potential teachers and facilities that is in the school, that is easy and can be implemented by teachers and students; media device Physics learning patterns lesson study already meet this aspect of the readability of the device, which can be seen from the results of the response of teachers and student response against the media device of learning Physics is very good, so the device gain category very practical; other than that based on the results of the student response against the media device of learning Physics as implemented in the classroom through the trials of individuals and small groups of trials, obtained the excellent response of the students, so the media device learning gain category is very practical.

Research has also shown us what works, hence we propose three specific, research-based teaching strategies that any teacher can begin using "right now" to increase learning in any classroom, whether resource rich or having only the bare necessities. We believe that using these strategies will bring us much closer towards the shared goal of literacy, numeracy, and all humans having basic social and life skills necessary to secure a job, to be an active member of a peaceful community, and to have a fulfilling life (Janet S. Twyman, William L. Heward, 2018: 11).

Catherine H. Crouch, Panchompoo Wisittanawat, Ming Cai, and K. Ann Renninger (2018) We have described findings from a first study of an IPLS course, in which introductory physics was taught embedded in authentic life science examples, and students' skills in applying physics to the life sciences were explicitly developed. Our findings indicate that in this context, students' interest in the examples predicts their exam score more accurately than their pre-IPLS interest in physics, and that students' interest in and attitudes towards physics increase over the IPLS semester. We interpret our findings as suggesting that using life science examples in this manner as the context for learning physics can support physics performance, support more expert-like attitudes as measured by the CLASS, and trigger the

development of student interest, especially for students who enter the IPLS course with low initial interest in physics. Our findings are consistent with prior work in which content of interest to participants is used as the context of instruction.

Our finding that students with high initial interest in physics show modest declines in their physics interest over the semester sounds a cautionary note, although it may solely reflect a ceiling effect or student anticipation. The interest literature suggests that for interest to continue to develop and deepen, students need to be challenged. Further study to better understand the interaction between students' level of interest in physics and the use of life science examples is needed. It is possible that a more sophisticated treatment of the life science examples would have better engaged the interest of the students with high initial physics interest; the open-ended responses suggest that simply including a life science example may not support them as effectively as would an example that pushes them to deepen their understanding of both the physics and the life science content of the example. Future curriculum development might include differentiated assignments designed to allow students who have greater initial interest in physics and/or more facility with mathematics to solve more challenging biological problems, or to work on project-type assignments that allow them to pose and investigate their own questions.

Media device Physics learning patterns lesson study made it already reached the category of very valid and very practical to use, so after a test of the effectiveness of the obtained results an increase in the science and process skills creative thinking skills of students. After a test of effectiveness against the media device of learning Physics lesson study pattern developed through the granting of pre-and post test-test, then conducted data analysis against the results of pre-and post test-test using the formula t-test for the right party, obtained a value of thitung for the science process skills of 23.85. The value of ttabel with db 64 0.05 significance level and was 1.671. $t_{count} > t_{table}$ value, this means H_0 is rejected and the H_1 is accepted, which means μ_1, μ_2 > so process skills science students said after learning of the learning media device by using patterns lesson study developed better than Science process skills of students before learning the learning media device by using patterns lesson study developed. The magnitude of the average increase (gain score) is 0.61, this value is in the range 0.7 <g> 0.3 which means average skills improvement process sain students is being. In general the dimension of science process skills of the most experienced an increase is observed, measure, classify, and predict, while communicating and menginferensi are still lacking. This is

because the learning that takes place during this time in school less opportunity to the students to learn to communicate the results of learning that students have acquired through presentations in the classroom, and communicate what students know or haven't the students know, as well as the less trained students such as reasoning ability via problems reasoning (inference) so that students have the ability menginferensi less.

The value of t_{count} to the student's creative thinking skills of 21.28. The value of t_{table} with db 64 0.05 significance level and was 1.671 $t_{count} > t_{table}$. value, this means H_0 is rejected and the H_1 is accepted, which means μ_1, μ_2 > so creative thinking skills of students said after learning by using learning media device Physics pattern lesson study developed better rather than creative thinking skills of students before learning by using learning media device Physics lesson study patterns developed. The magnitude of the average increase (gain score) of 0.44, this value is in the range 0.7<g>0.3 which means the average increase in creative thinking skills of students is being. In general the dimension of creative thinking skills that most experience increased is to think well, think flexible and think original because the students more easily understand that way of thinking, in accordance with the level of development and the understanding of the students, while elaboratif think and evaluate not all students can do well. Satisfy the desired destination using the media learning pattern in physics lesson study developed is to enhance skills of science process skills and creative thinking of students, indicating that the device is learning pattern in physics lesson study developed has been effective in improving the process of science skills and creative thinking skills of students.

Luce C. A. Claessens, Jan van Tartwijk, Anna C. van der Want, Helena J. M. Pennings, Nico Verloop, Perry J. den Brok & Theo Wubbels (2017: 478–493). The ability to create and maintain positive one-on-one relationships with students is of major importance for teacher job satisfaction and well-being. Positive teacher–student relationships also have a strong relation with student motivation and learning. Therefore, attention for building positive one-on-one teacher–student relationships deserves a place in the curricula of teacher education and professional development programs.

In this study for OECD member countries, students' having fun while learning topics in their schools, students'being in possession of enough laboratory materials to use in all courses, and their desire to be one of the best students in their class creates an job index value enhancing effect. However, borrowing or buying a book on science, schools' spend more money for science equipments, families's interests in school activities, and students' expectation to

complete college decrease the people's job index values (Ozlem Deniz Basar & Elif Guneren Genc; 2018).

IV. SUMMARY AND SUGGESTIONS

Summary

Based on the results of the research and the discussion which has been described previously, then a summary of the research problems that can be submitted is as follows.

1) Through this development research generated media device Physics learning patterns lesson study which is very valid. Learning media devices that are developed is evaluated with very valid category, with an average score of 4.59, thus fulfilling the very valid aspect as a learning device.
2) Through this development research generated media device Physics learning patterns lesson study which is very practical. Learning media devices that are developed is evaluated by category is very practical, with an average score of teacher's response amounted to 4.56 and the average score 4.65 of student response, thus fulfilling the very practical aspect as a device learning.
3) This development through research generated media device Physics learning patterns lesson study effectively to enhance the process of science skills and creative thinking skills of students before learning by using the device media learning pattern in physics lesson study with after learning by using learning media device
4) Media learning patterns lesson study; with the amount of science process skills to t_{count} amounting to 23.85 and magnitude t_{count} to creative thinking skills of students of 21.28.

Advice

Based on the results of this research, then the suggestions which can be recommended for further learning and research are as follows:

1) To teachers should implement a media device Physics learning patterns lesson study on subject matter Wave mechanics and optics are developed, as an alternative to improve the skills of the process of science and skill creative thinking of students. Through learning by learning these proven media device can improve the process of science skills and creative thinking skills of students.
2) For teachers who will be using the media learning pattern in physics lesson study developed these, so pay attention to good all prosesdur mualai implementation of the

Plan, Do come to See prior to use in the classroom to make it more secure its implementation.

3) For teachers in order to make the assessment instrument or matter which aims to improve students ' reasoning (inference) because in general the ability of students ' inference is still lacking.
4) For teachers in order to always provide an opportunity to the students to learn to communicate the knowledge they have acquired in learning.
5) For other researchers who create media device learning of physics, in order to choose the fields in accordance with their respective purview in order not to experience barriers in developing instructional media device.
6) For other researchers to do Physics learning media device development patterns lesson study in material physics, yet researchers develop.
7) For other researchers to do extensive testing against the media device of learning Physics developed, since device testing is only done to test the effectiveness (field test is limited).
8) For other researchers to do test the readability of the device against the media learning Physics developed.
9) For other researchers to use media device Physics learning and compare it with the media device of learning physics using other learning model for test comparisons, so that it is known what the advantages of the device This learning process.

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