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Turning Dreams into Reality: Current Trends in Mathematics,
Science and Computer Science Education

Head of MSCEIS : Dr. Sufyani Prabawanto, M.Ed.
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Dr. rer.nat. Mufti Petala Patria, M.Sc.

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PREFACE

The Seminar under the theme "Turning Dreams into Reality: Current Trends in Mathematics, Science and Computer Science Education" is conducted by Faculty of Mathematics and Science Education, UPI at October 19, 2013. The aim of the seminar is to provide a forum where teachers and researchers can exchange didactical, pedagogical, and epistemological ideas on mathematics, science, and computer science education which is expected to stimulate research in those areas. The seminar also provides an exceptional opportunity for all participants to contribute to the world of mathematics, science, and computer science education.

Some of outstanding scientists and educators from Germany, Australia, Hongkong, Malaysia, Singapore, Netherland, and Indonesia joined in this seminar made the seminar trully international inscope. There were 485 participants, had many fruitful discussions and exchanges that contributed to the success of the seminar. 153 papers discussed in the parallel session. The papers were distributed in 6 fields. 42 papers in mathematics or mathematics education, 19 papers in physics or physics education, 23 papers in chemistry or chemistry education, 25 papers in biology or biology education, 9 papers in computer science or computer science education, and are 18 papers in science education. Of the total number of presented papers, 153 included in this proceeding.

Genereus support for the seminar was provided by SEAMEO QITEP in Science and Himpunan Sarjana dan Pemerhati Pendidikan IPA Indonesia. The support permited us to gave an opportunitiy for a significant number of young scientists and persons from many universities and other institutions brought new perspectives to their fields.

All in all, the seminar was very seccessfull. We expect that these future seminar will be as stimulating as this most recent one was, as indicated by the contribution presented in this proceeding.

Chief of Organizing Committee ,

Dr. Sufyani Prabawanto, M.Ed.

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ASPECTS OF "CEPS" AS BASIS THE DEVELOPING INSTRUMENT OF PHYSICS LEARNING MOTIVATION

Elok Sudibyo, Budi Jatmiko, Wahono Widodo

State University of Surabaya

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ABSTRACT

This paper describes the steps in the developing instrument of physics learning motivation, particularly with respect to determining the motivational aspects of learning physics that can be used as a basis to formulate indicators of motivation to learn it. The motivational aspects of learning are used as the basis for the development of an instrument of motivation, include: **C**hoice of tasks, **E**ffort, **P**ersistence, and **S**elf-confidence (CEPS). Based on the four aspects of motivation, then they are formulated to indicators motivation for learn physics. Finally, the indicators that are used as the basis for formulating a statement items in a questionnaire as an instrument to measure motivation for learn physics. The motivation instrument is questionnaire using Likert scale. Based on the test results, it was an instrument that was developed motivation to learn physics has legibility Good value, content validity was also good, it can even be said Very Good, which is the value of 4.52 of the maximum value of 5. The degree of reliability Very High, which is indicated by a correlation coefficient of 0.948. The degree ofreliability of the instrumentwas obtainedbytest-retestmethodwith atime lag betweendatacollectionI andIIarefor twoweeks.

1. INTRODUCTION

Motivation is one of the most important elements that must be considered by the teacher when learningprocess, so that learning can be run effectively (Arends, 2012; Brophy, 2004; Palmer, 2005). Students are motivated to learn something to use higher cognitive processes in learning the material, so that students will absorb and precipitate with better material (Driscoll, 2000; Jetton & Alexander, 2001; Pintrich, 2003; cited by Slavin, 2009). Many studies have shown that students' motivation to learn something is a factor affecting student performance on learning outcomes (Anderson II, 2007; Christidou, 2011; Kang, 2010; Palmer, 2005; Schunk *et al.*, 2010; Sudibyo, 2008). Therefore, the task from the teacher is not simply deliver the subject matter, but important task for teachers is to guide, enhance and sustain students' motivation to learn, and engage in activities that lead to learning.

Motivation is usually defined as a process that stimulates our behavior or move us to action (Arends, 2012). Santrock (2008) defines motivation as a process that gives the spirit, direction, and persistence of behavior. The motivated behavior is behavior that full of energy, focus, and last a long time. While Maehr & Meyer (Brophy, 2004) states that motivation is a concept used to describe the initiative, direction, intensity, persistence, and quality of behavior, especially behavior towards a goal. Schunk *et al*. (2010) noticed that the motivation comes from the Latin verb movere and refers to "what makes people move" toward certain activities and tasks. Furthermore, Schunk *et al*. (2010) defines that motivation is a process that affects activity towards the goal and continuous nature. Meanwhile, psychologists define motivation as a process of internal (from within oneself) that enable, guide, and maintain a person's behavior over time (Murphy & Alexander, 2000; Pintrich, 2003; Schunk, 2000; Stipek, 2002; cited by Slavin, 2009). In line with the definition of experts, Woolfolk (2010) defines motivation as well as the internal state that arouse, direct, and sustain behavior.

Based on the various definitions of motivation above, it can be concluded that the motivations are internal processes that drive someone to do a particular activity or task to achieve the

goal and place in a certain time frame. Thus, the motivation to learn is an internal process that encourages learners to conduct or academic tasks to achieve learning objectives and are able to survive within a certain time frame. It is up to the learners achieve learning goals. Furthermore, especially motivation to learn physics, the activities or academic tasks chosen by learners are activities or tasks with the learning of physics.

Although motivation is one of the most important elements that must be considered by the teacher in the learning, but teachers often find it difficult to assess the level of students' motivation to learn. Therefore, it is necessary to develop an instrument that can be used by teachers to assess their students' learning motivation. In this paper, the researchers describe the steps that have been made in establishing a motivation to learn physics. The instrument was developed and presented in this paper is a form questionnaire using Likert Scale.

2. RESEARCH METHOD

In outline, the steps that have been done in the development process of this instrument include: (1) determining the motivational aspects of learning, (2) formulation of indicators of motivation to learn physics, (3) the preparation of a grain statement motivation questionnaire study physics, (4) readability test, (5) testing the validity of the content, and (6) reliability testing instruments. Step-by-step development of the instrument is done in order to produce a standardized instrument. Thus the motivation to learn physics instruments produced is expected to be used to collect the data, and the data collected is no longer questionable validity.

Aspects of Learning Motivation

We can not directly assess motivation because motivation is an internal process, which is occurs in a person. Nevertheless, we can conclude that someone is motivated or not the behaviors of them (e.g: the choice of a job, or the work done effort, perseverance or persistence in activities) or verbal expressions (e.g, "I really want to work on this task"). In addition, students are motivated in a course, the student will gain value or a satisfactory learning outcomes in these subjects. Thus, the study results can also be used as an indicator of whether the student is motivated or not on a particular subject. The expression on the line with that presented by Schunk *et al.* (2010) which states that the assessment of motivation can be seen from behavioral indicators of motivational aspects of what they call *Indexes of Motivation*. The indexes of motivation, ie *choice of tasks*, *effort*, *persistence*, and *achievement*.

Maehr & Meyer identified at least five aspects of motivation, which is associated with *initiation*, *direction*, *intensity*, *persistence*, and *quality* of a behavior (Brophy, 2004). The four aspects of motivation by Schunk *et al*. (2010) referred to as an index of motivation, basically not different from that is presented by Maehr & Meyer (Brophy, 2004). Motivational aspects related to *initiation* and *direction* by Maehr & Meyer, but Schunk *et al.* (2010) categorized the aspects of *choice of tasks*. While aspects of the *intensity* in the category of *effort*, and *quality* aspects categorized as aspects of *achievement*.

Some psychologists who study motivation (Graham & Weiner, 1996; Pintrich *et al*., 1993; citedby Woolfolk, 2008) focuses on five basic questions to judge a person is motivated or not. The five questions are: (1) What are the choices someone about his behavior? Why some students, focused on the homework while others would rather watch television, (2) How long a person to start doing it? Why some students immediately began work on homework, while others put off, postpone, (3) How high intensity or level of engagement of a person in the activities chosen? Once students open textbooks, whether the student is directly focused tasks or doing what is not clear, (4) What causes a man to survive or surrender? Will a student worked through physics tasks or just do a few chores alone, and (5) What is thinking and feeling person for engaging in an activity? Do students enjoy doing physics tasks, feeling competent, or worrying about an upcoming test.

Based on the above, the researchers categorize the four (4) aspects of motivation which would then be formulated indicators from every aspect. The four aspects of motivation, among others: (1) selection or interest in the task/activity, (2) efforts or the efforts to succeed, (3) persistence or perseverance, time spent on a task, and (4) a sense of confidence for engaging activities.

The first aspect of motivation is the **choice of tasks**. When students are faced with a variety of activities or tasks that can be done, and the students decided to specify an option on a particular task, then the choice of the students on the task indicates that the student is in a state motivated by the task. Students showed their interest in the selected task by doing the job either inside or outside the school, including when they have free time. Students can choose among a variety of activities.

The second aspect of motivation is the **effort**. Learning is often not easy. Students are motivated to learn are students who have a tendency to make efforts to succeed. Physics effort

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required on motor tasks, whereas cognitive effort required for academic learning. Students are motivated to learn likely expend more mental effort during learning and using cognitive strategies. Cognitive strategies, such as: repetition of information, organizing, monitoring the level of understanding and connecting with new material to prior knowledge. Students believed that the use of cognitive strategies will enhance their learning.

The third aspect of motivation is **persistence**. This aspect is related to the students' time spent on a task. Students are motivated to learn likely to persevere, especially when they are facing hurdles. Persistence is important because a lot of learning that takes time and the success is not possible in a short time. Perseverance mostly means for learning and when students face obstacles. Students with high persistence will work longer on a challenging task than students who have low persistence.

Finally, the fourth aspect of motivation is **self-confidence**. This aspect is related to what he was thinking and feeling during the students are engaged in a learning activity. Students who feel themselves competent will enjoy while working on the tasks given by the teacher. In addition, students who believed that he had a competency, the student never worried when the tests will come.

Indicators of Physics Learning Motivation

Indicators of motivation is a more specific elaboration of a motivational aspect that has been described previously. In formulating these indicators, in addition to referring to the motivational aspects of the foregoing, the researchers also conducted a preliminary study, which is to capture student responses related behaviors they exhibit when they are "motivated" to follow a particular subject. Preliminary study was conducted on a freshman class of 2011 S1-Science Education Program of Unesa, totaling 85 students. Student behaviors are used as a reference in developing indicators of a motivational aspect that has been determined by the researcher.

To ensure that respondents gave responses (answers) to the questions that have been given are actually correspond to reality (whatever they are) or not, the researchers provide a question-statements and should be answered (response) by the respondents were twice within different. In this case, the response I and II Response intermittent for 2 weeks. Behaviors (motivation indicators) that has the consistency, which is written by the same respondent on Response I and II, then organized by the researchers to be used as a reference in formulating indicators of motivation.

Some behaviors (indicators) were identified and reflects a person motivated students in a particular subject, based on the analysis of the consistency of responses written by respondents include:

- Always try to sit in front line
- Always learning and working on the problems that have not been taught (for next meeting)
- Enthusiastic listening and attention the lesson
- Active, if not understand ask the teacher
- Want to try and try although not success
- Like do the task although the teacher give a lot of task
- When the teacher ask to do the task, always ready
- When asked, always trying to answer
- Always try to understand the information from the teacher in front of class
- There is a willingness to learn without being ordered
- Likes to discuss with the teacher
- Feelings of pleasure, during school hours arrived
- Do the task with happily
- More early to do the task or homework
- Getting a good value, and satisfied with the value obtained
- Often reading the textbook
- Trying to understand (learn extra)
- Active during the learning, study at home, not sleepy during lessons
- Do not want a lesson ends and always look for interesting tasks
- On time in collecting the tasks set by the teacher

Some of these indicators are the result of an analysis of student responses, and the response has been providing consistently. These indicators are then used by the researcher as a "reference" to formulate indicators of motivation to learn physics, and then based on the indicators which will have been formulated, will be used as the basis for preparing the statement of items in a questionnaire (Instrument Motivation physics). However, some indicators have not been included in this

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preliminary study, further defined by the researcher with reference to motivational aspects that have been studied based on various studies literature.

Based on the literature review and preliminary studies have been conducted by the researcher, then the researcher formulate motivational aspects and indicators of motivation to learn physics as shown in **Table 1**.

Table 1. Aspects and indicators of physics learning motivation

No	Aspects	Indicators
1	choice of tasks	1) Interested to follow the activities of learning of physics. 2) Decide to select tasks related to learning physics than other tasks. 3) Immediacy in doing physics tasks. 4) Use the free time to do activities related to physics.
2	Effort	1) Having a tendency to make efforts to succeed. 2) Conduct a greater mental effort during learning physics. 3) Using cognitive strategies in learning physics.
3	Persistence	1) Do not be easily discouraged in learning physics when get a problem. 2) Spent a lot of time when do the task or challenging activity in physics lesson.
4	self-confidence	1) Believing that he has the capability of physics. 2) Enjoy while working on physics tasks. 3) Do not feel afraid when the physics test will come.

Questionnaire Statement Points of Physics Learning Motivation

Motivation can be assessed in various ways, such as: direct observation, assessment by others, and self-reports, as shown in **Table 2** (Schunk *et al*., 2010).

Table 2. Methods for Assessing Motivation (Schunk *et al.*; 2010, h. 13).

No	Categories	Definitions
1	Direct observations	Behavioral instances of choice of tasks, effort, persistence
2	Ratings by others	Judgments by observers of students on characteristics indicative of motivation
3	Self-reports	People's judgments of themselves
	Questionnaires	Written ratings of items or answers to questions
	Interviews	Oral responses to questions
	Stimulated recalls	Recall of thoughts accompanying one's performances at various times
	Think-alouds	Verbalizing aloud one's thoughts, actions, and emotions while performing a task
	Dialogues	Conversations between two or more persons

The various methods can be used to assess the learning motivation, learning motivation in developing instruments of physics, the researchers used a questionnaire method. Therefore, the writer must formulate a statement items of the questionnaire.

However, other considerations in choosing the questionnaire as a method of data collection, among others: (1) to collect data from a large number of subjects at the same time than the method of observation and interviews, (2) data collected using more objective than interviews because respondents could give more response freely, without being influenced by the mental attitude of the relationship between researchers and research subjects, or the time available to think of an answer, (3) to capture information related to the processes of cognitive and affective, that can not be obtained through observation, and (4) data more easily collected for analysis, because the written statements in the questionnaire are fixed and submitted to the same between the respondent and submitted to other respondents.

In Table 1 has been formulated aspects and indicators of motivation to learn physics. Based on the aspects and indicators are then formulated statement items of the questionnaire. The formulation of the statement questionnaire items is shown in **Table 3**.

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Table 3. Formulation of Questionnaire Statement Items of Physics Learning Motivation

No	Indicators	Statement Items
1	Interested to follow the activities of learning of physics.	• There is a sense of excitement in my self when arriving at college physics. • I always try to find a seat in the front, every learning process physics. • I always pay attention to the explanation of physics lecturer during the learning process physics. • If I do not understand the explanation from lecturer, I will ask him. • I never forgot to bring my physics books including instructions practicum when learning process physics. • I always follow the learning process physics with enthusiasm and never sleepy.
2	Decide to select the tasks related to learning physics than the other tasks.	• I will work physics tasks before doing other activities.
3	Immediacy to do physics tasks.	• When given the task of physics, I immediately started working on these tasks. • I always on time to collect assignments that given by lecturer of physics.
4	Use the free time to do activities related to physics.	• I often use my free time to do activities that related to physics.
5	Having a tendency to make efforts to succeed.	• I always worked on the whole physics tasks that given from the teacher. • When doing physics tasks, I always check every step because I want to do it perfectly.
6	Conduct a greater mental effort during learning physics.	• Answers to the questions that given from the lecturer by process thinking.
7	Using cognitive strategies in learning physics.	• I always repeat information that has been acquired in the learning process. • To understand the relationship between the concepts of physics, I like to make concept maps. • I often study early the material to be studied on campus as early knowledge.
8	Not easily discouraged in learning physics when get the problem.	• I never despair while working to finish the problems of physics even though the solution need extra hard to thinking.
9	Work a long time on the task or a challenging physics activity.	• I often do the physics tasks for a long time. • I often a long time read books about physics. • When do physics experiments, I often a long time.
10	Believing that he has the capability of physics.	• When asked about the matter physics lecturer, I am willing to answer questions voluntarily lecturer. • I never nervous when answer the questions in class.
11	Enjoy while work on the physics tasks.	• I do the tasks physics gladly.
12	Not feel afraid when the physics test will come.	• I never felt fear when will do the physics tests. • I do not have to study too hard when nearing the physics exam.

Formulation items statements have been prepared based on the indicators of motivation to learn physics is, then used to develop an instrument to assess student motivation to learn physics S1 Sport Science to physics lectures.

Testing of Readability and Contents Validity

Motivation to learn physics instruments that have been arranged then tested the legibility and validity of its contents. Test readability and content validity was conducted in two phases. The first phase, readability and content validity testing of the instrument is carried out through the presentation and discussion of subjects Instrument Development in Science Education courses S3, Graduate UNESA. In this activity, the researchers present and distribute instruments to the audience which consisted of 10 students S3 Science Education 2011 generation and two lecturers of the course builder Instrument Development. Through discussions, after the presentation session, both students and lecturers S3 Science Education Development Instrument builder courses provide inputs and provide an assessment of the readability and content validity of the instrument. Based on the evaluation conducted by 10 students and 2 S3 Science Education faculty adviser, the legibility of the instruments got good value. Likewise, the content validity Both instruments are also categorized. Inputs at the first stage is used to revise the instrument and then the second stage of testing.

In the second stage, readability and content validity testing is not done by the same people as in the first phase. Test legibility in the second stage was performed on S1 Science Education 2011 generation, which amounted to 85 students. The results of the assessment conducted by 85 students of the legibility of the instrument can be categorized as good, even nearing Quite Good.

Meanwhile, in order to test the validity of the content on this second stage, the writer involves three experts in the Science Education. Content validity testing to ensure that the statement items that have been formulated by the researcher is in accordance with the indicators and motivational aspects are used as a reference. Based on the results of the validation performed by a third person is apparently validator motivation to learn physics instruments that have been developed have value content validity were considered good, and even can be said is Very Good, with an average value of 4.52 of the maximum value of 5.

Testing of Instruments Reliability

Testing reliability of the instrument is intended to test the stability of the score and conducted by repeating the implementation of the provision of questionnaires to the respondents. This test is based on a concept which holds that if the questionnaire is reliable, then the repetition of the same provision of questionnaires to the respondents of the same, will not affect the score obtained by the respondents (Ali, 2010; Gronlund, 2003). Implementation of the repetition is done in a reasonable period of time did not allow respondents to recall statements filed and memorize the answers to the attitude scale in the provision of the first questionnaire. However, respondents to the substance of a rational retention statements in the questionnaire has not been diminished or lost. This means that the implementation must attention the range repetition time implementation questionnaire administration. In addition to be attention span repetition, repetition implementation must consider there is any additional experience related to the subject of the statement items in the questionnaire. This means that in the implementation of repetitions to be assured that the subject had been ruled out additional experiences related items in the questionnaire statements.

Having regard to the implementation of the criteria of reliability testing instrument, the researchers decided to carry out data collection, both Data I and Data II (repetition), conducted after a series of physics process learning ended. Thus, the decision Data I and Data II lecture no physics activity can influence the attitudes of students in response to the statements in the questionnaire. While interval between collection Data I and Data II later for 2 weeks.

Data Collection-I

Data Collection-I done by the researcher. In this case, the researcher as well as lecturer the physics at the Department of Sport Science UNESA S1. The time for collect the Data I was held on June 2012, after the students do the final exam physics lesson. The researcher chose to distribute the questionnaire together with the final exam schedule because the researcher wants to make sure that the respondents did not experience additional related statement items in the questionnaire.

Respondents in this trial is the S1 Sport Science UNESA, 2011 Generation, which consists of four parallel classes, which is Class A, B, C, and D, as well as each class totaled 35 students, so the overall number of respondents was 140 students.

In outline, the implementation of data collection-I was using the following procedure.

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1) The researcher requested that all students remain in the exam room, after they finished working on the problems of physics are tested and have been collecting their work.
2) The researcher distribute the questionnaire helped by other supervisors.
3) Before the students give response to the statement of items listed in the questionnaire, the respondents were asked to read the instructions on the questionnaire.
4) The researcher provide additional instructions that have not been written in the questionnaire, asked the students to write the ID number questionnaire responses on the back.
5) Students are given a maximum of 15 minutes to provide a response to the items in the questionnaire statements.
6) Students who have finished giving the response is welcome to collect questionnaires and allowed to leave the room in an orderly manner.

Furthermore, data has been obtained on Monday, June 4, 2012 is tabulated and scored. The data then is coded as a variable X, and the data obtained later when the repetition (Data II) is coded as a variable Y. It is required because it will be calculated the correlation between the variables X and Y.

Data Collection-II

Data Collection II was held on June 18, 2012 (2 weeks ago after taking Data I). In the implementation of this repetition researcher observe relevant criteria repetition period. Taking repetition period for 2 weeks because according to the researcher that the time period does not allow the subject rationally recall the statements that have been filed and memorize the answers to the questionnaire giving attitude scale at first. Instead, a rational retention substances subject to the statements in the questionnaire has not been diminished or lost. Criteria related repetition time span should be because the techniques used by the researcher to test the reliability of the instrument is the technique of repetition by using the same questionnaire to be administered in a different time.

Data retrieval Implementation II, as well as data retrieval I, conducted in the activities of final exams. However, if the decision I made when data subjects Physics exam schedule, the second data collection was conducted as scheduled exam courses, which coincide with the schedule of Pancasila Education lesson. Because the researcher uses repetition technique to test the stability of the scores (reliability), the subject of Data II when shooting the same subject when taking data I, that is S1 Sport Science class of 2011, amounting to 140 students..

3. RESULT AND ANALYSIS

As has been mentioned before that the implementation of this motivation instrument reliability testing using repetition techniques giving questionnaires. Scores obtained from the questionnaire administration time data retrieval I (X) and decision-Data II (Y) is then calculated index correlation, using Pearson Product Moment Correlation formula (r_{xy}), (Irianto, 2004: 137). The correlation coefficient is obtained that describes the degree of reliability of the instrument.

Furthermore, using the calculation formula to determine the value of r_{xy}. And, based on calculations using the program Microsoft Office Excel 2007, the value of r_{xy} of 0.948.According Vockell (1995), r_{xy} value of 0.948 is in the category of very strong positive correlation (but not perfect). Vockell (1995) categorizes the correlation coefficient $0{,}80 \leq r_{xy} < 1.00$ as a very strong positive correlation. In line with Vockell (1995), Arikunto (2008) also categorize r_{xy} value of 0.948 is in the category of very high positive correlation. According Arikunto (2008), a positive correlation was very high category, which r_{xy} values between 0.81 to 1.00. This means that the motivation to learn physics instruments that have been developed using the steps as outlined previously has had a very high degree of reliability.

High degrees of reliability of the instrument indicates that the high consistency of the scores obtained by the respondents when taking Data I and Data II. It also shows that the consistency of students in providing responses, relatively very high. The degree ofreliability of the instrumentwas obtainedbytest-retestmethodwith atime lag betweendatacollectionI andIIarefor twoweeks.

The researcher attention to the repetition period and the "control" of the additional experience of the respondents are also factors that can influence the degree of reliability of the instrument. It is as expressed by Ali (2010) that the error scores can be caused by the implementation of the delivery time frame repetition or because of the additional questionnaire subject experiences related items in the questionnaire statements. Therefore, assuming that the variable repetition time and experience the subject is constant, then the score obtained by the respondents of the first responses given will be relatively the same as the score obtained by the respondents on the responses given during the second repetition.

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4. CONCLUSIONS

The steps done in the development of motivation to learn physics instruments, including: (1) determining the motivational aspects of learning, (2) formulation of indicators of motivation to learn physics, (3) the preparation of the items studied physics motivation questionnaire statements, (4) readability test, (5) testing the validity of the content, and (6) reliability testing instruments.

Four aspects of motivation used in formulating the indicators motivation to learn physics, namely: (1) aspects of the choise of task or interest in the task/activity, (2) aspects of the efforts to succeed, (3) aspects of persistence in completing tasks, and (4) aspects of self-confidence for engaging activities.

Instruments developed the motivation to learn physics has legibility Good value, content validity was also good, it can even be said Very Good, the value of 4.52 of the maximum value of 5. While the degree of reliability Very High, which is indicated by a correlation coefficient of 0.948. The degree ofreliability of the instrumentwas obtainedbytest-retestmethodwith atime lag betweendatacollectionI andIIarefor twoweeks.

Testing the validity and reliability of the instrument can be performed on a larger sample, and using different data analysis techniques and more sophisticated.

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REFERENCES

[1]. Ali, Mohammad. 2010. *Metodologi dan Aplikasi Riset Pendidikan*. Bandung: Pustaka Cendekia Utama.

[2]. Anderson II, James C. 2007. *Effect of Problem-Based Learning on Knowledge Acquisition, Knowledge Retention, and Critical Thinking Ability of Agriculture Students in Urban Schools*. *Dissertation Doctor of Philosophy*. University of Missouri-Columbia. Email: JCAnderson@mizzou.edu

[3]. Arends, Richard I. 2012. *Learning to Teach,Ninth Edition*. New York: McGraw-Hill.

[4]. Arikunto, Suharsimi. (2008). *Dasar-dasar Evaluasi Pendidikan*. Jakarta: Bina Aksara.

[5]. Brophy, Jere. 2004. *Motivating Students to Learn. Second Edition*. New Jersey: Lawrence Erlbaum Associates (LEA).

[6]. Christidou, Vasilia. 2011. *Interest, attitudes and images related to science: Combining students' voices with the voices of school Science, teachers, and popular science*. *International Journal of Environmental & Science Education (IJESE)*. Vol. 6, No. 2, April 2011, 141-159. ISSN 1036-3065. Copyright 2011, IJESE. Tersedia: http://www.ijese.com/.

[7]. Gronlund, Norman E. 2003. *Assessment of Student Achievement. Seventh Edition*. Boston: Allyn and Bacon.

[8]. Irianto, Agus. 2004. *Statistik, Konsep Dasar & Aplikasinya*. Jakarta: Kencana.

[9]. Kang, H., Scharmann, L. C., Kang, S., & Noh, T. 2010. *Cognitive conflict and situational interest as factors influencing conceptual change. International Journal of Environmental & Science Education* (*IJESE*). Vol. 5, No. 4, October 2010, 383-405. Copyright 2010, IJESE. Tersedia: http://www.ijese.com/.

[10]. Palmer, David. 2005. *A Motivational View of Constructivist-informed Teaching. Research Report. International Journal of Science Education.* Vol. 27, No. 15, December 2005, pp. 1853-1881. ISSN 0950-0693 (print)/ISSN 1464-5289 (online). Copyright 2005, Taylor & Francis. Email: David.Palmer@newcastle.edu.au.

[11]. Santrock, John W. 2008. *Educational Psychology, Third Edition*. Boston: McGraw-Hill.

[12]. Schunk, Dale H., Pintrich, Paul R., & Meece, Judith L. 2010. *Motivation in Education. Theory, Research, and Applications. Third Edition.* New Jersey: Pearson Education.

[13]. Slavin, Robert E. 2009. *Educational Psychology Theory and Practice,Ninth Edition*. New Jersey: Pearson Education.

[14]. Sudibyo, E., Anisjak, I. N., & Iksan, M. 2008. *Penerapan Pembelajaran Kontekstual untuk Meningkatkan Motivasi dan Hasil Belajar Fisika Siswa SMPN 3 Porong*. Surabaya: *Jurnal Pendidikan Dasar*. Vol 9, No. 1, Maret 2008, 7 – 15. ISSN: 1411-285X.

[15]. Vockell, E. L., Asher, J. W. 1995. *Educational Research. Second Edition.* New Jersey: Prentice Hall.

[16]. Woolfolk, A., Hughes, M., & Walkup, V. 2008. *Psychology in Education*. England: Pearson Education Limited.
[17]. Woolfolk, Anita. 2010. *Educational Psychology, Global Edition, Eleventh Edition*. New Jersey: Pearson Education.

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