

Improved Characters and Student Learning Outcomes Through Development of Character Education Based General Physics Learning Model

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Abstract

Education Research in Indonesia has begun to lead to the development of character education and is no longer fixated on the outcomes of cognitive learning. This study purposed to produce character education based general physics learning model (CEBGP Learning Model) and with valid, effective and practical peripheral devices to improve character and learning outcomes of student. Character education is useful for forming learners of character and can solve the problems with actions that character. In addition, produce a generation of competent and have good character in accordance with the expectations of education, especially in Indonesia. Developing of learning devices is done by 4D design, namely define, design, development and disseminate. The product prototype I validated by experts and practitioners, then revised produced prototype II, then carried out a limited test in class. The Data was collected by learning outcomes test, questionnaire and observation sheet. The Data was analyzed statistically and descriptive. The Research results showed (1) validity of model quality is 3.96 (valid), (2) validity of lesson plan is 3.80 (valid), (3) validity of teaching materials is 3.59 (valid), (4) implementation of learning model is 77.50 (medium), (5) relevant aspects of student activity with learning activity is 80.23 (high), (6) student's response to the learning model is 83.45% (positive), (7) student's response to the learning devices is 87,50% (positive). The effectivity of learning model shown from improvement cognitive learning outcomes and student character. The cognitive learning outcomes increased during the three meetings and character of students during the learning began to appear. Based on reseach results concluded that CEBGP Learning Model and supporting devices have fulfilled valid, practical and effective criteria.

Keywords: *CEBGP Learning Model, learning outcomes, and student character*

1. Introduction

In the development of learners not only in the field of cognitive knowledge, but also moral and character themselves. Therefore, it is important for a given character education so that learners have good moral values in public life. In last recent years public's attention to low character marked by increasing of anti-social behavior such as criminal activity and violence (Berman, S., 2000). The Moral education should ideally able to face the problems of this character education (Vargas, et al, 2009). The low morale and character marked by a displacement in values, teenage pregnancies, increasing of fighting between students, free sex and pornography, increasing drug abuse, plagiarism, corruption and soon. (Damon, W. 2008; Fernandez, et al. 2008; Rotriguez, et al. 2005, Urra, J. 2006). Social phenomena shown low values moral reached all of society levels to professionals levels, community leaders, scholars, educators, political elite, even to the leaders of the nation (Husen, et al 2010).

In the last Three Years in Indonesia, The National Education aims to build human character that is faithful and devoted to God Almighty, noble, healthy, intelligent, knowledgeable, capable, creative, independent, and become responsible and democratic citizens. Based on national education goals it is clear that character education should be carried out deliberately, systematically and continuously in formal and informal education (Kamaruddin, S. A. 2012). This is an important concern for the Indonesian government in achieving educational character and produce a generation of good character. Because the Indonesian government not only expect competent in knowledge generation but also with good character as well.

State University of Medan (Unimed) as one of the educational institution in Indonesia appreciates that goal. The nature and form of appreciation is reflected in the Unimed motto as "Character Building University". To achieve the motto conducted various activities, related to the lectures conducted by integrating character education in lectures through, the learning development devices based character education with its implementation in lectures activity. Integration of character education in lectures require a learning model that can embed, and construct the expected characters. Integrating of character education in the lecture must be a chore for lecturers to realize human character. In other words character

education success lies in the role of lecturers to design and implement learning (Koesoema, A. D. 2007).

The results of a preliminary study at the Department of Physics Unimed found that student's learning outcomes in General Physics tend to low with lack of good character. It is identified on the habits of students are found such as; attitudes of students that lack of gratitude, like cheating and make notes during the test, don't serious and responsible in doing the task just copy and paste other people's work, do not take the data when experiment held, and just take requesting data from others, less able to work and are less tolerant to own friends. Related to the above, the ability of professors are required to design a learning model that can accommodate the appropriate learning material substance and can become a place of development of character values.

Character is a reliable inner disposition to respond to situations in a morally good way (Lickona, T. 1991). The next Hill, T. A (2005) said "character determine someone's private thought and someone's action done. Good character is the inward motivation to do what is right, According to the highest standards of behavior, in every situation ". Character is the behavior that based on values according to religious norms, cultural, legal / constitutional, customs, and aesthetics (Direktorat Jenderal Pendidikan Dasar, 2011). The Character education include various initiative should be used to having to do virtues, values education, citizenship and education education of affect (Berkowitz, M. & Bier, M. 2004), with the characteristics of much use habits and values of goodness (Lapsley, D. Y. & Narvaez, D. 2006). The Good character education should be established and developed with deliberate early (Murphy, M. 2002).

The character education at The State University of Medan shall lead to the establishment of the Indonesian people fully. One embodiment of the character education is the integration of character values into all subjects. Integrating the values of the character of students through courses conducted by implementing appropriate learning model in accordance with the character that will be developed. According Lickona, T (1991) in order to run an effective character education teachers should use a variety of models and methods that has instructional and nurturant effect in cultivate character on students. The nurturant effect of the model developed is the character of gratitude, honesty, accuracy, perseverance, curiosity, responsibility, confident, cooperation and tolerance.

2. Method

Type of research used in the developing CEBGP Learning Model is a Research and Development (R and D). Stages R and D according to Borg and Gall (1983) include: (1) collecting data and information, (2) planning, (3) making the products design, (4) limited trial, (5) major product revision, (6) large-scale trials, (7) operational products revision, (8) field trials, (9) final product revision, and (10) dissemination. This stage can actually be condensed into four stages, called 4D, which define, design, development and disseminate (Thiagarajan, et al, 1974).

Research Procedure, Define the first phase was conducted to analyze the needs related to the product that will be developed. Information was gathered through a preliminary study of literature studies and field studies. The study of literature relating to the study of the document. Field studies related to the information on the implementation of the general physics learning, the role of the teacher, a student learning outcomes, students character as well as research findings required in designing the product.

The second phase of design: (a) Prototype CEBGP Learning Model, (b) learning devices (Lesson plans and teaching materials), (c) preparation of cognitive achievement test and the character of students, (d) the preparation of the assessment in the form of learning model validation sheet, lesson plans, and teaching materials, (e) observation sheets implementation of learning, student activities, and (f) preparation of the questionnaire responses of students and lecturer to The CEBGP Learning Model.

The third phase, Developed of produce prototypes I. This developing activities include: (a) quality validity prorotipe CEBGP Learning Model, (b) validity of learning device, (c) limited trial. The validity prototype model and the quality of learning is done by judgement to experts and practitioners to fill the sheet of validation that has been provided. The feasibility and the revised products criteria by using the guidelines in Table 1.

Table 1. Range Score, Level Eligibility and Criteria Revision

| Range Average Score | Eligibility and Criteria Revision level |
|---------------------|---|
| 4.0 to 5.0 | Very valid and very decent, not revised |
| 3.0 -3.9 | Valid and decent with minor revisions |
| 2.0 to 2.9 | Not decent, revised |
| 1.0 to 1.9 | Very not decent, revised |

Source: Derlina and Sabani (2015)

Model and learning devices that have been validated, then revised based on comments and input from the validator, resulting prototype II. The CEBGP Learning Model which have fulfilled validity and practicality criteria subsequently tested on a limited basis with the aim to measure the quality of the model of the aspect effectiveness in the implementation of learning in class. Subject to limited trials are students Physics Education in C class of 2014 as many as 29 peoples.

Data Analysis Techniques and Interpretation of Research Results, The data obtained from the study were analyzed descriptively. It is intended to determine the validity, practicality and effectiveness CEBGP Learning Model was developed. The Criterion validity and practicality of prototype The CEBGP Learning Model refers to the criteria (Nieveen, N., 1999). The CEBGP Learning Model will be valid, if mean score (≥ 3), the results of the validation data analysis showed that priototipe decent used models. The CEBGP Learning Model is practically if the scores practical level enforceability of the current model was applied in the classroom, including in the high category. Implementation model criteria refers to methods of grading in summative evaluation of Bloom, et al (1981), namely: $90\% \leq MI$ is very high, $80\% \leq MI$ is higher, $70\% \leq MI < 80\%$ is moderate, $60\% \leq MI < 70\%$ is lower, $MI < 60\%$ is very low by MI as Model Implementation.

Effectiveness of the model criteria, refers to the incorporation of the criteria proposed by: Kemp, et al (1994), and Eggen, P. D & Kauchak, D. P (1988), the model is effective, if met at least 5 of the following 6 criteria.

- a. The average student activity on the task at a minimum of 90%.
- b. Average active student activity at least 4 0%.
- c. Conformance level student activity observed with student activity expected a minimum of 80%.
- d. There is a trend of increasing test scores b elajar and character of students.
- e. More than 50% of students responded positively to The CEBGP Learning Model.
- f. Lecturers give a positive response to The CEBGP Learning Model.

3. Result

Result of Researcher, The main product in this research is The Character Education Based General Physics Learning Model (CEBGP Learning Model) and devices supporting learning proper use. A feasibility level models and teaching devices developed view from validity of product, practically, and effectively. The validity and practicality of the test results obtained by the experts was the effectiveness of the data obtained from the test results is limited. The model and learning devices that declared invalid and subsequent practical in limited trial to obtain data on the effectiveness of The CEBGP Learning Model and related learning tools. The Data was presented by expert test data and test results are limited CEBGP Learning Model and supporting learning devices.

Test Validity CEBGP Learning Model Result, Test validity CEBGP Learning Model results is divided into two, namely a theoretical validity of the prototype CEBGP Learning Model and validity of supporting learning device. The mean value of each indicator of experts are presented in Table 2.

Table 2. Mean Value of Test Expert Indicator for Quality CEBGP Learning Model

| No. | Indicator | The mean value of each component from Experts | | | | Mean Value Indicators |
|---------------------|--------------------------------------|---|------|------|------|-----------------------|
| | | 1 | 2 | 3 | 4 | |
| 1. | Social system | 4:40 | 4:08 | 4:18 | 4:33 | 4. 25 |
| 2. | Reaction principle | 4:25 | 4:09 | 4:27 | 4:40 | 3. 25 |
| 3. | Basic theory | 3.82 | 4:17 | 4:00 | 4:27 | 4. 07 |
| 4. | Supporting systems | 4:33 | 3.82 | 3.82 | 4:40 | 4. 09 |
| 5. | Impact instructional and accompanist | 4:17 | 4:25 | 3:25 | 4:17 | 3.96 |
| 6. | Syntax | 4:25 | 4:33 | 4:40 | 4:08 | 4. 27 |
| Average Value Total | | | | | | 3.96 |

Source: Derlina and Sabani (2015)

The mean total score of expert validation indicators to quality of learning model is 3.96. The results stated that CEBGP Learning Model considered valid with feasible criteria used to minor revisions. Learning devices is divided into two, namely lesson plan and teaching materials. Teaching materials developed are designed in an integrated manner includes teaching materials, student activity sheets (SAS) and assessment instruments.

Test Expert Results on Lesson Plan (LP), Experts test on the lesson plan analyzed by attention in formulating indicators aspect, media / learning resources, clarity scenarios and variations learning activities and time management. The mean value of the indicator of experts and practitioners are presented in Table 3.

Table 3. Test Expert Results on Lesson Plan

| No. | Indicator | The mean value of each indicator Expert | | | | Mean Value Indicators |
|------------------|--------------------------------|---|------|------|------|-----------------------|
| | | 1 | 2 | 3 | 4 | |
| 1. | Formulating indicators | 3.67 | 4.11 | 4.33 | 4.11 | 4.04 |
| 2. | Teaching materials | 3.00 | 3.50 | 4.25 | 4.00 | 3.69 |
| 3. | Media / learning resources | 3.50 | 4.25 | 4.33 | 3.00 | 3.77 |
| 4. | Clarity learning scenarios | 3.50 | 3.50 | 4.17 | 4.17 | 3.84 |
| 5. | Variations learning activities | 3.00 | 3.5 | 4.11 | 4.00 | 3.65 |
| Mean Score Total | | | | | | 3.80 |

Source: Derlina and Sabani (2015)

Based on Table 3 mean total score of 3.80, the score states that the lesson plan developed is valid category, fit for use with minor revisions.

Expert Test results to Teaching Materials, Test experts to teaching materials reviewed based on three indicators: completeness of component, material substance and physical layout of teaching materials. Components teaching materials include the title, the competension base and indicators, materials, activities and training/test/simulation. The substance of teaching materials covering the truth, the coverage of the material, present and legibility. The Components include the physical appearance and lay out letters. Result oriented expert analysis of indicators of teaching materials acquired ha seal test as presented in Table 4.

Referring to the Tabel 4 total score indicator of teaching materials is 3.59. This result suggests that the teaching materials developed are grouped in categories valid and fit for use with minor revisions. The results of trials of limited use for the purpose of measuring the practicality and effectiveness of learning devices are developed.

Practicality Test Results Learning Devices, Practicality teaching model in terms of the level of adherence to the model of learning. Implementation learning model is done by making observations on the

implementation of learning from pre-learning activities, core and cover. The results of the implementation of learning observations are presented in Table 5.

Table 4. Average Score Indicator Teaching Material By Expert

| No. | Indicator | The mean scores of each indicator Expert | | | | The mean scores Indicators |
|------------------|---|--|------|------|------|----------------------------|
| | | 1 | 2 | 3 | 4 | |
| 1. | Component Instructional Materials | 3.57 | 4.00 | 3.85 | 3.42 | 3.71 |
| 2. | Substance Instructional Materials | 3.75 | 3.00 | 4.20 | 3.80 | 3.69 |
| 3. | Display Instructional Materials Physics | 3.50 | 3.00 | 3.00 | 4.00 | 3.38 |
| Mean Score Total | | | | | | 3.59 |

Source: Derlina and Sabani (2015)

Table 5. Average Score Implementation Learning

| No. | Meeting | Scores observers | | The mean score of the observer |
|----------------------|------------|------------------|----|--------------------------------|
| | | 1 | 2 | |
| 1. | 1 meeting | 70 | 75 | 72.5 |
| 2. | 2 meetings | 75 | 80 | 77.5 |
| 3. | 3 meetings | 80 | 85 | 82.5 |
| The mean total score | | | | 77, 5 |

Source: Derlina and Sabani (2015)

Based on table 5, the mean score implementation learning had increased at each meeting. The mean total score of learning implementation is 77, 5, still in the moderate category. These was possible due to the limited time of this limited trial.

Effectiveness Test Results of Learning Devices, Effectiveness of learning devices analyzed from five categories, namely: (a) students activities, (b) students response, (c) lecturer response, (d) The results of cognitive learning, and (e) the development of student character.

Student's learning activity data obtained through observation of learning activities CEBGP Learning Model. The mean score of student activities for student activity aspects that are relevant to meeting the criteria of effectiveness Learning Activities (80.23), while mean percentage of student activities are not relevant to Learning Activities (31.03) the low category.

Student response data on the implementation of the learning obtained from the questionnaire are filled by students after attending learning by using CEBGP Learning Model on kinematics material. Student responses are known to the statement includes students happy, feel more clear and feels nice and new learning for students, 83.45% of the students gave a positive response was pleased to components of learning activities. Based on the student's response stated that the application of CEBGP Learning Model, said to be "effective and practical".

Lecturer response data to the implementation of the learning obtained from the questionnaire are filled by lecturer after observe implementation of learning by using CEBGP Learning Model on material Kinematics. Response lecturer visits of faculty opinion about indicators lesson plans, teaching materials, learning activities and student activity sheets. 87.50% of lecturers to give a positive response to the learning device components. Based on the response lecturer stated that the application of CEBGP Learning Model, said to be "effective and practical".

Cognitive learning outcomes are analyzed student learning outcome of students obtained after following learning. Description of increasing learning outcomes can be seen in Table 6.

Table 6. Description of Cognitive Student Learning Outcomes Data

| No. | Test Results | 1 meeting | 2 meetings | 3 meetings |
|-----|-------------------------------|-----------|------------|------------|
| 1. | Highest Score | 60 | 80 | 88 |
| 2. | Lowest value | 30 | 50 | 60 |
| 3. | The average value of the test | 41.2 | 67.3 | 80.5 |
| 4. | Classical completeness | 0% | 56.7% | 86.4% |

Source: Derlina and Sabani (2015)

Based on the description of cognitive student achievement test in Table 6 an increase in learning outcomes at each meeting.

From observation learning results shown character intrapersonal and interpersonal student developing as presented in Table 7.

Table 7. Data Description Student Character Development

| No. | Character | The value of character | | | The mean | Category |
|----------|----------------|------------------------|------------|------------|-------------|----------|
| | | 1 meeting | 2 meetings | 3 meetings | | |
| 1. | Thankfulness | 1,50 | 1.60 | 1.80 | 1.63 | MT |
| 2. | Curiosity | 1,50 | 1.60 | 1.90 | 1.67 | MT |
| 3. | Responsibility | 1.25 | 1.90 | 2,00 | 1.72 | MT |
| 4. | Thoroughness | 1,50 | 1.80 | 1.90 | 1.73 | MT |
| 5. | Perseverance | 1.80 | 1.90 | 1.80 | 1.83 | MT |
| 6. | Honesty | 1.90 | 1.75 | 1.90 | 1.85 | MT |
| 7. | Self-confident | 1.80 | 1.60 | 1.70 | 1.70 | MT |
| 8. | Cooperation | 1,50 | 1.80 | 1.80 | 1.70 | M T |
| 9. | Tolerant | 2,40 | 2,60 | 2.80 | 2,60 | MB |
| The mean | | 1.68 | 1.83 | 1.96 | 1.83 | MT |

Description: MT (starting to look), MB (starting entrenched). Source: Derlina and Sabani (2015)

Based on data from the observation of the value of the students character has increased every meeting with a mean value of 1.83 in the category began to appear.

4. Discussion

Results of the validation quality of The CEBGP Learning Model and supporting learning devices conducted by experts and practitioners in the category valid and decent for use. The CEBGP Learning Model quality meets valid category due to the relationship between the components of the model are consistently interrelated and interact. Devices developed learning meets the valid category is caused by several factors: (a) the components of the learning device The resulting set of indicators relevant to the validity of the instruments, (b) devices developed relevant to aspects of content validity and construct validity, content validity with regard to content, currently construct validity with regard to the relevance between the components in the lesson plan and teaching materials. Although according to experts and practitioners learning model and the device is valid and feasible to use in the implementation of classroom learning, still need to be revised as advice and expert comments and subsequently revised by practitioners. Then, product had revised by device empirics validity through limited trial.

The effectiveness and practicality device known from the observation feasibility study, the response of lecture and students towards learning, student activities and an increase in learning outcomes and student character. The value of learning process that developed increasing due at the end of each lesson is always held reflection and follow-up to the findings and inputs submitted by observers to enhance the device.

The positive response of students to the components of the learning activities. This matter is due

defenders more interesting and useful distance, make it easier for students to understand the concepts of kinematics, motivate students to form their own knowledge so as to be better learning outcomes and can form good at self-characters students. Another finding in the study that models and devices developed learning can improve cognitive learning outcomes and student character. The CEBGP Learning Model can form the character of gratitude, curiosity, responsibility, honest, conscientious, diligent, confidence, cooperation and tolerance. Gratitude characters formed within a model student for learning in the learning activities CEBGP Learning Model always begins and ends with prayer. Prayer is a form of recognition of the existence of God Almighty, confident and believe that everything happens by the will of Almighty God.

Improved honesty character occur in CEBGP Learning Model because students are trained to be individuals who believe in their own abilities. Honest character trained in study on data collection activities in the experiment. Activities students conduct experiments and discussions to make learning more meaningful for students to have a deeper portion to express its ideas (Charvalo, 2005). In experiments in groups of students make observations, measurements and reporting of data and information in accordance with the facts and real information. The Data was reported in the group of students compared with other groups of data. Lecturer to carefully consider the similarity of tasks and reports each group. Group similarity assignment and report not qualify will be asked to make observations back to report the facts as well as the corresponding data different from the data and reports of other groups.

Responsibility character began to look at indicators of the increasing willingness of students to complete the task on time and trying to make observations and the collected data with full concentration. Increased characters responsibility towards the better because this character is always trained on the stage of investigation and presentation of the results of the investigation and the collection of the results of the investigation report. Students are given the full responsibility for solving the problems of learning without depending on the other groups. Kamaruddin, S. A (2012) stated that responsibility for making someone be discipline, and always do all things as good as possible.

The Students character thoroughness, diligence and honesty began to look, it is known from indication of the seriousness of the students pay attention to the instructions of the faculty, the percentage of group discussion following the seriousness and seriousness in completing the task. Accuracy student views on the willingness of students when performing experiments, students take measurements carefully, carefully and repeatedly to obtain more accurate data. As the Stallions, M and Karol, Y (2003) that the character education as persistence can be formed through a process of investigation, experimentation, reflection and demonstration. In addition, each child essentially has the character of an honest and should be developed (Jubileecentre, 2015).

The cooperation character was having higher value with ranging entrenched categories. A pro-active, comprehensive, collaborative and scientific approach only will the make the character education initiative Likely to be more effective "(Berkowitz, 2002). This happens because students regularly reminded that the full tolerance value the opinion of others-teamwork. The percentage of students trained to work with confidence and confidently present the results obtained, do not hesitate, do not be afraid of. If there is the work of students who are less precise. Carefully lecturer advise, develop ideas of students to a better direction. This learning positive effect in stimulating the courage of the students stated their creative ideas to form the character of confidence. The Classroom became more caring, respectful and inclusive Students community when teachers establish effective character education (Kagan, S. 2001). Finally, we found that academically excellent character education provide opportunities for students to Contribute in meaningful ways to the school and its community (Jacques, S. et al, 2003).

Curiosity character of students ranging entrenched seen from the attitude and actions of students who always tries to do things and solve the problem in more depth. Improved character curiosity occurs because students are motivated constantly gain knowledge, seek information from various sources, in various ways. Encourage students to work hard to get the resolution of a problem.

Beside increasing in the value of the character, in this study the cognitive learning students also increased. This is in line with the results McDermott, et al. (2000) that learning gives students the opportunity to conduct an effective investigation to improve the procurement of the concept of the student. The effectiveness of learning occurs because in Students learning actively involved seek and find their own answers to the problems, not just passively receive information from the lecturer. Since the beginning of learning the existence of a problem to be solved, it is expected to students to be develop the ability to understand the problem and the critical thinking ability in order to improve learning outcomes (Kaptan, F and Korkmazh, H. 2002 Student motivated to engage directly seek out, find the concept of physics by means and capabilities so that students have the skills to solve problems, more responsible and more easily understand the subject matter (Barrows, H & Tamblyn, R. 1980; Mecling, K. 1995; Malinouski, J & Johnson, M. 2001; Akinoğlu, et al., 2006). The process learning which

involved students directly in learning activities, thinking critically, and analytically to find the solving problem will be able to improve student learning outcomes. The Characters Education would be strong potential to be a critical tool in the process, students got the opportunity to solve problems which get guarantee them to increase problem solving skills, and their critical thinking skills in an investigation related to solving the problem (Akinoğlu, et al., 2006; Berkowitz, 2002).

5. Conclusion

Based on the results of research and discussion concluded that: (1) step is the development learning model of Character Education Based General Physics (CEBGP Learning Model) developed referring to 4D development models that define, design, development and disseminate appropriate to be used by following these steps, (2) Learning device developed have to fulfill valid criteria after revised, (3) Learning device has fulfilled the effective and practical criteria because it has succeeded in improving the cognitive learning outcomes and developing student character.

In this study was conducted in a smaller scope therefore to examine the comparative advantages of CEBGP learning model needs to be done experimental research in a broader scope. In addition, the development instrument that has been used is expected to continue to be developed and adapted to the conditions and the situation is more diverse. For further research is expected to do more extensive research with larger samples varied with different environment and culture. And to improve and develop an instrument that is used with the capabilities of a broader scope. So, it can be used in generally.

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