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by Kosim Kosim

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Character Value-Integrated Causalitic Model Student Worksheet Development Strategy to Improve Creative Thinking Ability and Character Change

Huraiza Mahmudah¹, Joni Rokhmat^{1,2}, Kosim^{1,2}

¹Physics Education Study Program, University of Mataram

²Master of Sciences Education Study Program, University of Mataram

*Email: huraizamabd@gmail.com

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Abstract - This study aims to identify a strategy for developing Character Value-Integrated Causal Model Student Worksheet to improve creative thinking skills and change the character of junior high school students. Character value-integrated causal model is a learning model that is used to develop students' potential in identifying and describing the causes and effects of a phenomenon or problem in everyday life related to the student's character. The research type is Research and Development with 4-D model encompassing define, design, develop, and disseminate. The result of this research is a design of a character value-integrated causal model Physics worksheet for business and simple machines materials for the 8th grade junior high school level. The strategy for developing a worksheet with character value-integrated causal model contains several unique characteristics, including: describing phenomena that contain several cause-effect elements, providing phenomena that are related to problems about character in everyday life to be identified, having a causality table, providing space for explanations, loading moral messages related to problems about character, using concise, clear, easily understood language, and using supporting images that are related to the phenomena described.

Keywords: Student Worksheet Development; Character Value; Causalitic Model; Creative Thinking Ability; Character Change.

INTRODUCTION

This century, Indonesia ranks fourth on the list of countries with the largest population in the world. In addition to the increasing population, several criminal cases in Indonesia are also increasing, especially those of juvenile delinquency which is receiving more and more attention from day to day. The young generation is a valuable asset of the nation that will determine the future. However, the decline in the character of the younger generation is a disaster that must be addressed immediately (www.bps.go.id).

A discussion on character is highly crucial and fundamental. To quote an opinion of Gabrino (2009): if a nation wants to survive, said nation must have regulations that determine what is wrong and what is right, what is allowed and what is not

allowed, what is fair and what is not, what is appropriate and what is not. Therefore, there need to be ethics in speaking, regulations on traffic, and other social rules. Character, according to Coon in Zubaedi (2011), is a subjective assessment of a person's personality that is related to personality attributes that can or cannot be accepted by society.

Presidential Regulation Number 87 of 2017 confirms the Strengthening of Character Education which is an educational movement to strengthen the character of students under the responsibility of the education unit. The objectives of Character Education Strengthening are (1) to build and equip students as Indonesia's golden generation, (2) to develop the foundation of national education that places character education as its main spirit by paying

attention to cultural diversity, and (3) to activate and strengthen the educational ecosystem's potential or capabilities (Presidential Regulation, 2017).

Physics is essentially a collection of bodies of knowledge, ways of investigating, and ways of thinking. Physics lesson is viewed as a process to develop the ability to understand the concepts, principles, as well as laws of physics. Therefore, effective and efficient learning strategies or methods must be considered in its learning process. In junior high school, Physics is one of the subjects that can facilitate the students in learning about themselves and their natural surroundings (Rokhmat, 2019).

The results of observations in MTsS. (Private Islamic Junior High School) Tarbiyatul Mustafid Narmada shows that the school's physics lessons have not facilitated the students to develop open thinking skills. One of the reasons for this is the selection of the learning model which is dominated by direct instruction, hence resulting in the students' becoming less actively involved during the learning process. The teacher also emphasizes that physics is only based on mathematical calculations. This causes students to think that physics is difficult. In addition, students often behave badly, especially during the lessons.

Creative thinking (divergent thinking) refers to the creative ability to discover many possible answers to a problem based on available data or information (Rahardjo, 2019). According to Munandar in Amtiningsih et al. (2016) creative thinking skills consist of 4 indicators, namely: (1) fluency, (2) flexibility, (3) originality and (4) elaboration. Some of these creative thinking indicators are what can be used as benchmarks to judge if the students have already been able to think creatively well. In regards to this, it is also necessary to have

character education in the learning process, in order to form good personalities.

A strategy that can help students improve their creative thinking skills and change their character is by developing student worksheets using character value-integrated causal model in the learning process. The causal model worksheet is a worksheet design that is based on the characteristics of the causality model. It contains physics phenomena whose causes and effects that may occur from said causes must be analyzed by students. In each worksheet, a causality table consisting of causes and effects is provided. Students are asked to complete the components of the table based on to the number of causes and effects that have been determined and to complete the explanations for each effect component written. Rokhmat (2018) states that causal learning model is a model that considers the main activity in the learning process to be oriented towards developing students' potential in causal and analytical thinking. The syntax of the causal learning model is divided into four phases (stages) of learning, namely: (1) the orientation phase, (2) the causality-concept exploration and development phase, (3) the argument preparation phase, and (4) the evaluation phase.

The development of student worksheets with character value-integrated causal model can serve as a new strategy that has unique characteristics to improve students' creative thinking abilities and change their characters. Research conducted by Anshori et al. (2019), Sari et al. (2020), and Nurjamilah et al. (2020) proves that the causal model does have an influence on the increase in students' creative thinking abilities.

RESEARCH METHODS

This research’s type is Research and Development with 4-D model, namely define, design, develop, and disseminate (Sugiyono, 2018). The *define* stage aims to determine and define learning requirements, which begin with needs and objective analysis. The *design* stage aims to design the format of the learning tool that is a character

value-integrated causal model student worksheet. The *develop* stage aims to produce the learning tool that is a character value-integrated causal model student worksheet. The *disseminate* stage aims to spread the product that is a character value-integrated causal model student worksheet. Details of the stages of the research can be seen in Figure 1.

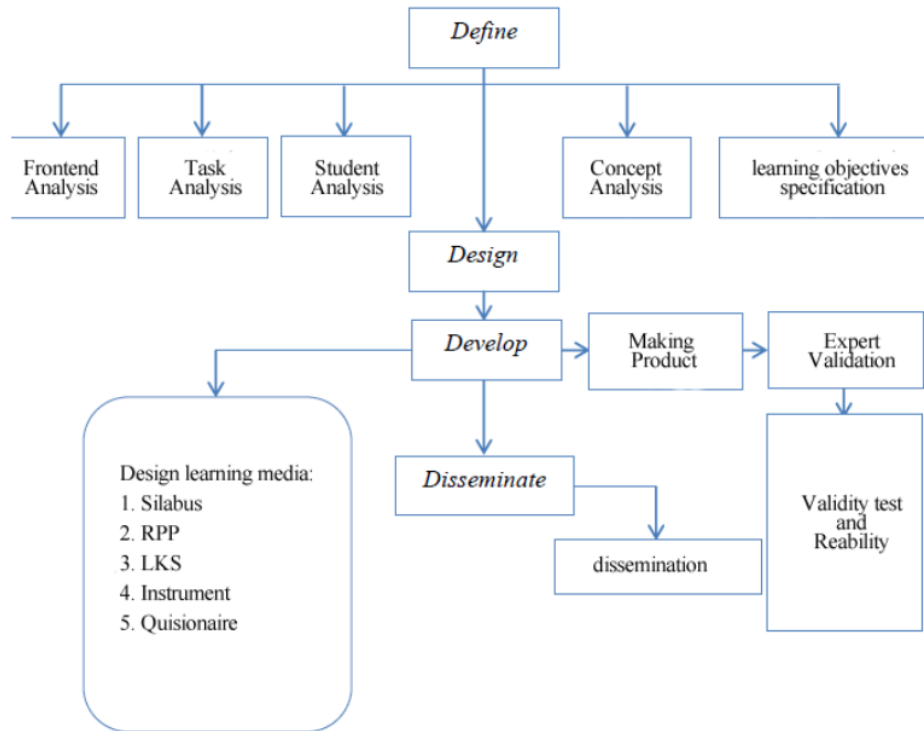


Figure 1. 4-D Model Chart

RESULTS AND DISCUSSION

The result of this research is a design of a character value-integrated causal model Physics worksheet for business and simple machines materials for the 8th grade junior high school level. The following is a description of the strategy for developing a character value-integrated causal model student worksheet to improve students' creative thinking skills and also change their character.

Student-worksheet-development Conceptual Framework

The character value-integrated causal model student worksheet has unique and different characteristics when compared to other types of worksheets. This worksheet facilitates students in developing creative thinking skills and provides space for the students' character to change for the better. This worksheet is designed based on the characteristics of causal model. The creative thinking abilities measure four indicators

which include: 1) fluency (thinking fluently), that is, students' ability to choose the effects that might occur; 2) flexibility (thinking flexibly), that is, students' ability to provide arguments by involving concepts, principles, theories and/or laws of physics; 3) originality (thinking originally), that is, students' ability to make arguments with their own wording from their own ideas—not from books or other sources; and 4) elaboration (thinking detailly), that is, students' ability to elaborate and/or develop each of the elements causing the phenomenon. The character values measured are caringness, discipline, honesty and responsibility. Caring is defined as a tendency to involve oneself in problems, situations, or conditions arising around them. Discipline is defined as the ability to control oneself and obey the rules. Honesty is defined as a trait that requires a match between words and actions. Meanwhile, responsibility is defined as the ability to solemnly do something.

The phenomena presented in the character value-integrated causal model student worksheet are everyday-life phenomena that are related to the problems surrounding the students' character that the students might have direct experience. This is so that the students are more interested in analyzing the phenomena, based on their own understanding and experience. The analysis results of the phenomenon are presented in a causality table consisting of the components of cause and effect. The students then provide an explanation of the components of the causes and effects that have been determined. This activity of analyzing serves as a forum for students to develop creative thinking skills. In addition, through phenomena containing moral messages about every day-life character-related problems, students are also given the space and opportunity to change their

character to be better. The phenomena in the worksheet are presented using concise, clear and easily understood language. Supporting images related to the phenomena described are also used/provided.

Student Worksheet Model Description

The development of the design of the worksheet is based on the characteristics of the causal model. The components of the causal model student worksheet consist of: 1) worksheet title, 2) student identity, 3) objectives, 4) basic competencies and indicators of competency achievement, 5) instructions for filling in the worksheet, 6) phenomena, 7) causality tables, and 8) space for explanation. The phenomena that will be identified in this worksheet are related to character-related problems in everyday life. The components refer to the student-worksheet component according to Prastowo (2011), which consists of six main elements, namely: 1) title, 2) learning instructions, 3) basic competencies or subject matter, 4) supporting information, 5) tasks or work steps, and 6) assessment.

The Implementation of Student Worksheet in Lessons

Causal learning model is divided into four phases (stages) of learning, namely: (1) the orientation phase, (2) the causality-concept exploration and development phase, (3) the argument preparation phase, and (4) the evaluation phase. After the first phase, the lesson proceeds to the second phase, namely the causality-concept exploration and development phase. At this stage, the teacher first divides the students into several groups and distributes student worksheets. Then, the teacher informs the students about the steps for completing the phenomena represented in the worksheet's structure design. The worksheet's structure consists of: 1) title, 2) student identity, 3) objectives,

4) basic competencies and indicators of competency achievement, 5) instructions for filling in the worksheet, 6) phenomena, 7) causality tables, and 8) space for explanation. The essential thing that students need to pay attention to is when the teacher explains the instructions for filling in the worksheet in order that the students understand the phenomenon and can fill in the causality table and the explanation space in the worksheet. For the next activity in the argument preparation phase, the teacher guides students to identify the conditions of each cause-effect element that is likely to occur from the phenomenon. Then in the evaluation phase, the teacher facilitates the students to match perceptions and/or revise perceptions related to the phenomena analyzed. Here, the teacher also provides the students with opportunities for material strengthening by developing constructive follow-up questions. Lastly, the teacher concludes the results of the learning activities.

Examples of On-worksheet Student's Work

The results of the work on the worksheets show that the students are able to achieve the four indicators of creative thinking skills, namely fluency, flexibility, originality, and elaboration. As for changes in character, the changes can be seen from the students' being able to be disciplined, honest and responsible in doing the tasks assigned to them. The phenomena provided in the worksheet also contain moral messages about care for others. The following is an example of the answers given by students.

The students' ability to think fluently (fluency) is considered to be attained because the students are able to choose the possible effects that might occur for the existing phenomena; The students' ability to

think flexibly is considered to be attained because students are able to provide arguments by involving concepts, principles, theories and/or laws of physics;

Tabel 1. Kausalitas untuk Fenomena 1.

Penyebab (ada 6)	Akibat (ada 3)
1. Kotak barang tidak bergerak atau dalam keadaan diam.	W bernilai positif
2. Kotak barang bergerak keatas atau searah dengan gaya (F).	
3. Bergerak berlawanan arah	W bernilai nol
4. F Rio lebih besar dari W _{berat}	
5. F Rio lebih kecil dari W _{berat}	W bernilai negatif
6. F Rio sama dengan W _{berat}	

Penjelasan:

Akibat 1: dapat terjadi jika gaya menahan Rio lebih besar dibandingkan dengan gaya berat kotak barang ($F > W_b$), sehingga kotak barang akan bergerak ke atas dan mengalami perpindahan sesuai dengan arah gaya yang diberikan Rio (F). Berdasarkan hal tersebut, maka usaha yang dilakukan Rio bernilai positif. Secara matematis, $W = F \cdot s$ (dengan $W =$ usaha, $F =$ gaya menahan Rio, dan $s =$ perpindahan). Karena arah s sama dengan arah gaya (F), maka usaha Rio adalah positif.

Akibat 2: dapat terjadi jika gaya menahan Rio sama dengan gaya berat kotak ($F = W_b$), sehingga kotak barang tidak bergerak atau dalam keadaan diam.

Akibat 3: dapat terjadi jika gaya menahan Rio lebih kecil dibandingkan dengan gaya berat kotak ($F < W_b$), sehingga kotak barang akan bergerak ke bawah dan mengalami perpindahan sesuai arah berat kotak.

Figure 2. An Example of Student's Work

The students' ability to think originally (originality) is considered to be attained because students are able to make arguments with their own wording from their own ideas—not from books or other sources; and The students' ability to think in details (elaboration) is considered to be attained because the students are able to elaborate and/or develop each phenomena-causing elements.

Limitations

Based on the discussion above, the limitations found in this study were the lack of students' attainment for creative thinking skill indicators 2 (IBK-2) and 4 (IBK-4). Here, the things that need to be done in order to improve the students' creative thinking skills for IBK-2 and IBK-4 are putting more

emphasis on learning, especially in distinguishing causes and effects that have the possibility to occur, and in explaining concepts, principles, theories, and/or laws of physics related to the material being discussed. In addition, even though the two classes had gone through a learning simulation before the treatment was given, the students were still not used to using the model so that the learning that uses the character value-integrated causal model took a longer time.

CONCLUSIONS

Based on the discussion elaborated before, Physics' student worksheet with character value-integrated causal model of business and simple machines materials for the 8th grade junior high school level is adjusted to the characteristics of the causal model and students' character-related problems in everyday life. The results of the analysis concluded that this character value-integrated causal model student worksheet has unique and different characteristics when compared to other types of worksheets. The strategy for developing a worksheet with character value-integrated causal model contains several characteristics, including: describing phenomena that contain several cause-effect elements, providing phenomena that are related to problems about character in everyday life to be identified, having a causality table, providing space for explanations, loading moral messages related to problems about character, using concise, clear, easily understood language, and using supporting images that are related to the phenomena described.

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