International Journal of Engineering Research and Technology. ISSN 0974-3154, Volume 13, Number 12 (2020), pp. 4616-4621

Improving Students' Creative Thinking Skills through Google Classroom Assisted GO_KAR Model during the Covid-19 Pandemic

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Abstract

The preliminary study results showed that in general, the creative thinking skill of Junior High School students in Bangkalan, Madura was low. Meanwhile, the learning models that are often used by teachers are Problem Based Learning and Discovery Learning. The researchers intend to develop the GO_KAR model, an innovation of the two learning models mentioned previously. This study aimed to describe the content validity and the GO_KAR learning model's construct, which was developed to improve Junior High School students' creative thinking skills. This study used Focus Group Discussion (FGD) as a method of data collection validation. The validity of the GO_KAR learning model is assessed from the aspects of content validity and construct validity. The validation of experts through FGD showed that the GO_KAR model is in a very valid category to improve students' creative thinking skills. The GO_KAR model can be implemented in the learning process to enhance Junior High School students' creative thinking skills in a science subject.

Keywords: Validity, content, construct validity, GO_KAR model.

I. INTRODUCTION

The development of science and technology in the 21st century is rapidly increasing, the era of industrialization and globalization shows it. Its development supports human life. This evidence requires people to have sufficient skills to follow science and technology [21; 33]. The development of science is currently designed to involve students in three aspects of rationality, research, and relevance [37; 1]. There are four groups of skills to conquer this 21st century, namely how to think, how to work, tools for working, and how to live in the world [8], which will be able to help students reach their full potential [24; 2]. The quality of education equips students with thinking skills. One of the skills students need to master to achieve educational goals in the 21st century is creative thinking skills [23].

Biology so far is perceived as a memorisation subject [26; 3]. The learning process tends to focus on the textbook, which is not true because biology is a science part. Science lessons are essentially defined as scientific processes, scientific attitudes, and scientific products [14]. They should be carried out by scientific inquiry to foster creative thinking skills [7]. In science learning, the students must think critically and a series of processes to find new facts, concepts, and knowledge through science learning [20]. The purpose of science learning, according to the regulation of the Minister of National Education (Permediknas) No. 22/2016, at the level of primary and secondary education is to acquire essential competencies in science and technology and to cultivate critical, creative, and independent scientific thinking. However, the Program for International Student Assessment (PISA) results show that Indonesian students could not apply knowledge and skills autonomously and creatively to deal with various situations, including new conditions (0.8%) [22]. Indonesian students need to strengthen their ability to integrate information, draw conclusions, and generalise their knowledge into other forms [35].

Based on the survey regarding students' creative thinking skills to the eighth-grade students of nine Junior High School in the Bangkalan Regency, the students' skills were low (51.91% not creative, 29.63 less creative, 16.93 quite creative, and 2.12% creative). Some research shows the obstacles in developing students' creative thinking skills are because (1) it has not been appropriately handled in learning, so it is crucial to integrate the skills to think creatively to every lesson [27]; (2) the learning process, especially science, still relies on how to understand concepts, principles, and theories and has not become a means to empower students' creative thinking skills [29; 30]; (3) For several years, educators have only considered creative thinking skills as a process that can only be done individually [13]; (4) The teacher does not know the right way to increase students' creativity in the learning process in the classroom [16]; (5) the learning approach used to develop creative thinking skills is too difficult for students who have limited creative thinking in knowledge and skills [11].

The variety of abilities of students' creative thinking skills require a learning condition that involves learning experiences to develop. Several ways can be enforced to train creative thinking skills, including 1) according to Yildrim & Ozkahraman (2011) [38], creative thinking skills and problem-solving can be improved through conditioning and thinking. 2) activities such as observation, experiment, field trips can develop students' creative thinking [4; 6] Open questions (open problem) are also activities that can facilitate creative thinking skills [9; 36]. 4) Facilitating creative

thinking that requires scaffolding must be done by asking students again about things related to the problem they face without overly controlling them [31]. Some suggestions for practicing these thinking skills can be recommended in developing a learning model to facilitate students' creative thinking skills.

The learning environment and learning conditions can be created with a learning model. The learning model will direct the teacher to use various abilities to achieve creative learning goals. The learning model is a broad and comprehensive teaching approach with a coherent theoretical basis or a rationale for the learning objectives to be completed, teaching behavior, and the learning environment needed to achieve learning goals [5]. The learning model component as a teaching approach includes theoretical and empirical support, syntax, social systems, reaction principles, support systems, instructional and accompaniment impacts [15; 12]. The learning model is said to be of high quality when it meets three criteria, namely: (1) model validity, a measurement of the quality of the model in terms of content validity including the need for model development and the novelty of knowledge (state-of-the-art knowledge), and construct validity of the consistency between the components of the model and the supporting theories; (2) the practicality of the model, the model can be applied in the settings that have been designed and developed, and (3) the effectiveness of the model, the impact of using the model can produce the expected results [25].

Efforts have been made to develop creative thinking skills in secondary schools, such as applying the GO_KAR model in classroom learning. The accuracy of the GO_KAR model in facilitating the improvement of students' creative thinking skills can be firstly done by testing the validity of the models and supporting devices that were developed by the experts. Therefore, this article discusses how the GO_KAR model's effectiveness improves students' creative thinking skills at the Junior High School level.

II. RESEARCH METHOD

This study aims to develop a valid GO_KAR learning model to improve Junior High School students creative thinking skills in science. The subject of this research is the GO_KAR learning model itself. The research design refers to educational research design (academic research design), an investigation developed to develop research-based solutions in solving complex problems in education [25]. This study focuses on testing the validity and construct validity of the developed GO_KAR model. The validity measured in this study includes content validity and construct validity [19]. The validity of the model content is a validator's assessment of the intervention component based on the needs and state of the art.

In contrast, the model of construct validity is an arrangement. This framework reflects a construction that the developed product components are supported by specific theories and able to measure thinking, such as cognitive, affective, psychomotor aspects. Learning model validation sheets were used to obtain data on the validity of the learning model. The validation sheet is filled with experts who review and assess the learning model developed by the researcher. The developed model and supporting tools are reviewed and evaluated by experts during the FGD. The FGD activity focused on discussing the learning model's validity and supporting tools for the developed model.

II.I. Research Instrument and Procedures

Experts carried out collecting data on the validity of the GO_KAR model by using the GO_KAR model validation sheet. The validation sheet was filled by the experts who review and assess the learning model which id developed during the FGD. The evaluation of the validity of the model content is examined from several aspects of the assessment, namely: 1) the needs for GO_KAR learning model development, 2) the design of the model meets the novelty of the knowledge (state of the art of knowledge), 3) the description of GO_KAR model.

The assessment of the construct validity model is reviewed from these following aspects of evaluation: 1) rationality and sequence system model, 2) theoretical and empirical support for the GO_KAR learning model, 3) GO_KAR brief model, 4) social system, 5) reaction principles, 6) support systems, 7) instructional and accompaniment impact, 8) [5; 25; 19].

II.II. Data Analysis

The validity of the GO_KAR model is calculated based on the mode values of five experts in each measurement aspect. The final score is obtained from the mode score. The GO_KAR model and the supporting tools which id developed are indicated to be valid if the results of the assessment are categorised as valid and reliable. The reliability of the GO_KAR model validation sheet instrument is based on the *interobserver agreement,* which is obtained from the statistical analysis of the percentage of agreement (R) [10].

Percentage of agreement (R): $1 - \frac{A-B}{A+B}$ x 100%

Information:

R: Reliability

A: The frequency of behaviour aspects observed by the observer who gives a high frequency

B: The frequency of behaviour aspects observed by the observer who gives a low frequency

Table 1. The Criteria of Learning Model Validity

Interval Score	Assessment Criteria	Remarks
3.25 < P ≤ 4,00	Very valid	Can be used without revision
2,50 < P ≤ 3,25	Valid	Can be used with less revision
1,75 < P ≤ 2,50	Less valid	Can be used with many revision
1,00 < P ≤ 1,75	Not valid	Cannot be used and needs improvement

III. RESEARCH RESULT

1. The result of evaluating the content validation of the GO_KAR model obtained from the instrument are shown in Table 2

Table 2. Content Validity data and GO_KAR Construct Model

No	Asessment Aspects	Modus Score	Category	Reliability
A.	**Content Model**			
1	The needs for model development	4	Very Valid	100% (Reliable)
2	Model design meets the updating knowledge (*State of the art of knowledge*)	4	Very Valid	100% (Reliable)
3	Description model of GO_KAR	4	Very Valid	94,7% (Reliable)
B	**Construct Model**			
1	Rational model and sequence syntax model	4	Very Valid	100% (Reliable)
2	Theoritical and empirical support for GO_KAR model	4	Very Valid	94,7% (Reliable)
3	Syntax model	4	Very Valid	94,7% (Reliable)
4	Social system model	4	Very Valid	94,7% (Reliable)
5	Reaction principles	4	Very Valid	94,7% (Reliable)
6	Supporting system	4	Very Valid	94,7% (Reliable)
7	Instructional impact and accompaniment impact	4	Very Valid	94,7% (Reliable)
8	Learning environment and model class management	4	Very Valid	94,7% (Reliable)
9	The implementation of GO_KAR Model Assessment and Evaluation	4	Very Valid	94,7% (Reliable)

Remarks: The validity score s obtained based on the modus score given by five validators

Based on the data in table 2, the categories that arose mostly from the aspects of the model content and construct model are very valid. It indicates an assessment made by five experts on all aspects of the content and constructs validation. GO_KAR model is declared very valid. The consistency of the assessment between experts can be seen through the reliability test. Each of them has a reliability coefficient of 97.4% and is in the reliable category. These results indicate that there is consistency in the assessment between experts on the GO_KAR learning model component. Hence, it meets the requirements and is suitable for science subjects to improve Junior High School students; creative thinking skills.

2. The Validity result of the GO_KAR learning model from the assessment instrument construct validity, as shown in table 3.

Table 3. Validity Data of Learning Model

No	Learning Materials	Modus Score	Category	Reliability
1	Syllabus	4,0	Very valid	94,7% (Reliable)
2	Lesson Plans	4,0	Very valid	94,7% (Reliable)
3	Students' Book	4,0	Very valid	94,7% (Reliable)
4	Students' Worksheets	4,0	Very valid	94,7% (Reliable
5	Assessment of Students' Creative Thinking Skills	4,0	Very valid	94,7% (Reliable)

Remarks: The GO_KAR model learning device's validity data is very valid within a very valid category with a reliability percentage of ≥75%.

IV. DISCUSSION

IV.I. The validity of GO_KAR Learning Model

Referring to the data, as shown in table 2, it can be seen that the content validity of the GO_KAR model is stated to be very valid, with reliability between 94.7% - 100%. The need for developing the GO_KAR model viewed from the developed model is the latest research trend needed by the community to overcome all existing problems and is considered a determinant of success in 21st-century life. GO_KAR learning model is also required related to the needs for learning model to achieve the goals of national education including developing potential students, competent, creative, independent and democratic and responsible and also have the responsibility and other competencies which should be achieved in science subjects have skills to think and act creatively and independently through appropriate scientific approaches based o the issues they learn and other resources independently [17].

Content validity shows the novelty aspects of the GO_KAR learning model in facilitating creative thinking skills. The novelty of the GO_KAR learning model lies in the learning syntax stage, where students are independent in learning. Students independently must ask research questions or problem formulations, design problem solutions, and report their findings creatively and independently. Another novelty is seen in the syntax's final phase, where students must reflect independently and classically. Classroom structure is created in a democratic manner that ensures students to express opinions or argue. The teacher is only a facilitator and motivator in guiding the course of learning and ensuring all logistics are available. Following Yildrim & Ozkahrahman (2011) [38] opinion, creative thinking skills can be improved through clearly defined learning steps. The results of the GO_KAR learning model validity have been declared to meet the requirements in content because they have met the need and designed based on the novelty (state of the art)

IV.II. Construct Validity of GO_KAR Learning Model

The GO_KAR model's construct validity based on table 3, the assessment conducted by experts on all aspects, shows that construct validity is very valid. The supporting components of the GO_KAR model is consistent and interrelated. GO_KAR has a reliability coefficient of 94.7% or is in a reliable category. These results indicate that there is consistency in the assessment between experts on the components of the GO_KAR model, so they can meet the requirements and suitable to be used in science subjects. The construct validity of the GO_KAR learning model is stated to be very valid because it is logically designed, and there is consistency between the learning model and the theory that underlies it. The consistency between phases can be viewed from the rational sequence of stages that make up the syntax model. The consistency between the components' model is known from the sound linkage of the model, syntax, social systems, reaction principles, support systems, and instructional and accompaniment impacts. The consistency between the model and underlying theory can be seen based on the relationship between the model and the learning theories. It can be seen from the results of the validation that all components of the GO_KAR model measured in the construct were declared very valid by the five validators.

The validation analysis is supported by the GO_KAR model reliability analysis to determine the developed learning model's reliability. Data in table 2 and table 3 show that the reliability coefficient is above 75%. These results indicate that the contents and constructs of the GO_KAR model have been developed based on the robust supporting theories because they have a high percentage of agreement. Borich (1994) [10] states that the forged instrument is reliable if it has a portion of ≥75%. In line with Plomp's (2013) opinion, one of the requirements for a high-quality learning model is when it meets the content validity. It includes the need for model development and state-of-the-art of knowledge and constructs validity regarding the consistency between model components and the consistency between the model with supporting theories.

IV.III. The learning tools validity in supporting the implementation of the GO_KAR learning model

The GO_KAR model needs to be supported by learning tools in its implementation in the class. The learning tools used must also be in the variable category. The supporting learning

tools' validity data in Table 4 shows that all supportive tools (syllabus, lesson plans, worksheets, student textbooks, validated creative thinking skills tests are very valid with a reliability of 94.7%. The data shows that all the supporting tools will support the implementation of the GO_KAR model in classroom learning that has met the requirements to facilitate the improvement of students' creative thinking skills.

V. CONCLUSION

The assessment of the validity of the GO_KAR developed model has a very valid category. The percentage of agreement from the content validity assessment ranges from 94-7% to 100%, classified as reliable. The assessment of the GO_KAR developed model's construct validity has a very valid category with a percentage of agreement of 94.7%, and it is classified as reliable. Learning equipment also has a very valid category; 94.7% percentage of agreement is classified as reliable. GO_KAR model can be implemented in learning to improve the creative thinking skills of Junior High School students. This study's results still require further research, especially for implementing the learning process in the classroom to determine the developed model's practicality and effectiveness. Relevant further research is conducted to see and analyze the usefulness and effectiveness of the GO_KAR model in improving creative thinking skills.

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