

# Developing investigation group learning model based on Marzano instructional framework to promote students' higher order thinking skill

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**Abstract.** Higher order thinking skill is one of the skills that must be possessed by 21<sup>st</sup> century students. The purposes of this study are to develop a conceptual model of investigation group learning model based on Marzano's instructional framework and to analyze the design and validation of the learning model. The approach used in this study was Research and Development (R&D). Then, observations, questionnaire, interviews, and Focus Group Discussion (FGD) were used as the data collection techniques. The results of validity test showed that the investigation group learning model based on Marzano's instructional framework is valid and relevant to be applied in social studies learning at junior high school level to improve students' higher order thinking skills. In addition to obtaining a conceptual learning model, this development also created learning instruments, namely syllabus, lesson plan, teaching materials, observation sheet of critical and creative thinking skills, and test of critical and creative thinking skills that can be used in social studies learning at junior high school level especially on the material of Plurality. Considering that the purpose of education in general is to improve students' skills, so the investigation group learning model based on Marzano's instructional framework can present effective learning criteria.

## 1. Introduction

Education, unquestionably, should be able to create human resources that are able to compete in the 21st century. In this regard, 21<sup>st</sup> century education requires students to master various skills, such as critical thinking skills, creative thinking skills, problem solving skills, decision making skills, collaboration skills, information literacy and technology as well as life skills to be able to work and survive. Those skills are then known as transferable skills.

Higher order thinking skill as one of transferable skills is very important to be developed in teaching and learning process at school. Higher order thinking skill itself occurs when a person takes new information and information stored in his memory and interrelates and/or rearranges and extends this information to achieve a purpose or to find possible answers in perplexing situations (King *et al.*, 1997). Therefore, students' higher order thinking skills can be developed when education is not only



directed at mastering and understanding concepts or materials, but also at improving students' thinking skills by involving them in a real learning activity.

It is clear that the teacher is not only required to have theoretical understanding, but is also required to have practical experience. These two aspects are very important because the teacher is not only conveying the material, but also creating meaningful learning experiences. In the 2013 curriculum, especially in social studies subjects, the purpose of education is to foster students to become good citizens. This is in line with Sumaatmadja (2007) who states social studies aim to foster students to become good citizens who have knowledge, skills, and social care that are useful for themselves as well as for society and the state [2]. To this end, the learning process should not only be limited to cognitive aspect, but should also be able to develop students' higher order thinking skills so that students will be able to master various skills needed to compete in the 21st century.

Based on preliminary observations conducted in several junior high schools in Kuningan Regency, it is revealed that students' higher order thinking skills are still low. This can be seen from the number of students who did not listen when the learning process took place and who have difficulty in asking and expressing opinions during the discussion. Besides, the average scores of both critical and creative thinking skills achieved by the students are still below the minimum completeness criteria. These show that students' higher order thinking skills are relatively low. The low level of students' thinking skills is caused by several factors, including the teacher's habit in carrying out the learning process which adopts the conventional method of teaching so that the students are unable to explore and solve social problems independently. Besides, it also happens because the learning process is only directed at memorizing and receiving information, without requiring students to understand and relate the information received to their daily lives.

Therefore, the appropriate selection and application of learning model is a must in order to provide maximum output as well as to help students to easily understand the materials conveyed by the teacher. One of the learning models that can develop students' higher order thinking skills is cooperative learning. According to Asma (2006, p. 12), "cooperative learning is based on an assumption that students cooperate in a group learning and, at the same time, each student is responsible for the learning activities so that all group members can understand the materials well." [3] In this study, the cooperative learning model selected is Investigation Group. The selection is based on the consideration that social studies contain materials which require higher order thinking skills to solve social issues. It is in line with Sanjaya (2008, p. 243) who explains "investigation group is a cooperative learning enabling students to take an active role and think critically in completing specific tasks." [4] Further, Slavin (2009, p. 216) notes "Investigation group is suitable for integrated study projects relating to understanding, analyzing, and synthesizing information as an effort to solve multi-aspect issues." [5] Thus, to facilitate students to get used to think critically and creatively, to have positive attitudes and perceptions of learning, to acquire and integrate knowledge, to extend and refine knowledge, to use knowledge meaningfully, and to build productive habits of mind, the investigation group learning model based on Marzano's instructional framework is used.

Marzano' (1992) developed his instructional framework based on five dimensions of learning, namely attitudes and perceptions, acquire and integrate knowledge, extend and refine knowledge, use knowledge meaningfully, and productive habits of mind [6]. These five dimensions of learning are interrelated and form a framework that can be used to improve the quality of learning [7].

Reflecting on the above description, the problems raised in this study are formulated into the following questions; 1) How is the conceptual model of investigation group learning model based on Marzano's instructional framework to promote students' higher order thinking skills? and 2) How are the design and validation of investigation group learning model based on Marzano's instructional framework to promote students' higher order thinking skills?

## 2. Method

The approach used in this study was a Research and Development (R&D). Operationally, the Research and Development began with the collection of materials from the field as a basis for designing the

model. The preliminary study was conducted to identify and inventory the field needs in order to obtain the materials needed during the development process. This preliminary study was carried out by conducting a survey held at the 2<sup>nd</sup> and 3<sup>rd</sup> week of May 2018 by using closed questionnaires. The questionnaires were distributed to 100 eighth graders (50 females and 50 males) and four social studies teachers in four junior high schools in Kuningan Regency. This preliminary study aimed to find out the habituation of higher order thinking (critical and creative thinking) in junior high school by analyzing teachers' learning instruments (syllabus and lesson plan) and the teachers' as well as students' perceptions about the teaching and learning process. The results of this preliminary study then became the basis for developing the model. In addition to questionnaire, observations, interviews, and Focus Group Discussion (FGD) were also used to collect the data. Focus Group Discussion was carried out systematically based on activity guidance, including facilitators who guide the discussion in each group, teaching instruments, assessment rubrics, and assessment recommendation forms.

### 3. Results and discussion

This development was done to develop a conceptual model of investigation group learning model based on Marzano's instructional framework that is able to promote students' higher order thinking skills (critical and creative thinking skills). In addition to obtaining a conceptual learning model, this development also created learning instruments, namely syllabus, lesson plan, teaching materials, observation sheet and test of critical and creative thinking skills that are in accordance with the implementation of investigation group learning model based on Marzano's instructional framework. The development of this learning model was applied especially on the material of Plurality at the eighth grade of Junior high school.

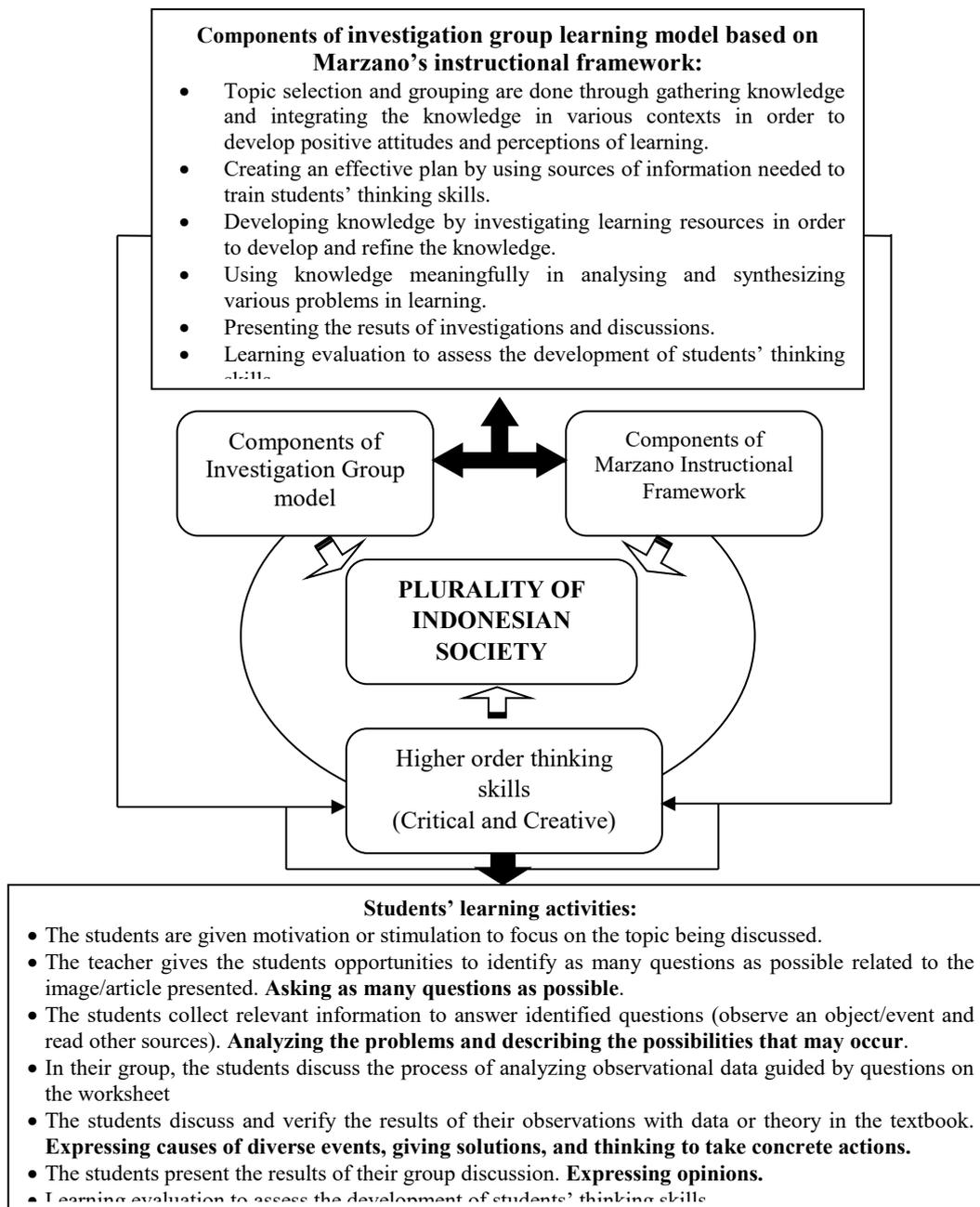
#### 3.1. Conceptual model of investigation group based on Marzano's instructional framework

Based on the preliminary study, some important points are highlighted; 1) Although most social studies learning in junior high school in Kuningan Regency have met the process standards seen from the learning administration, the teachers have not fully encouraged students to think critically and creatively, especially in addressing various issues regarding the diversity of Indonesian society. Therefore, there is a need for further evaluation and development of learning instruments as well as learning practices; 2) Teacher's factors become very important in designing and carrying out the teaching and learning process that promotes students' critical and creative thinking skills in social studies learning. Hence, it is necessary to conduct training to improve teachers' capacity in designing as well as implementing effective and quality teaching and learning process; and 3) The learning model that aims to promote students' critical and creative thinking skills has not well implemented in social studies learning. Therefore, social studies teachers must broaden their knowledge and understanding regarding methods, approaches and learning models that promote students' critical and creative thinking skills by seeking information and in-depth literature studies.

Based on the three points highlighted, the researchers tried to develop an investigation group learning model based on Marzano's instructional framework which is oriented on promoting students' critical and creative thinking skills. The principles of investigation group learning model based on Marzano's instructional framework are as follows: 1) Creating a conducive learning environment; 2) Providing issues associated with daily lives; 3) Providing opportunities for students to complete tasks cooperatively; 4) Providing performance objectives containing operational verbs to direct students' performance in analyzing the materials; and 5) Using prior knowledge in the long term memory to reconstruct material concepts which will then result in assimilation of knowledge.

In general, investigation group learning model based on Marzano's instructional framework aims to develop thinking processes in a cognitive domain specifically by promoting the capability of information processing from a concrete stage to abstract and encouraging reasoning. To achieve a significant experience, Marzano (1992) published a learning dimension theory developed from learning assumptions that accommodate how one learns and thinks [6]. Marzano's learning dimension consisting of five dimensions is further developed into an instructional framework controlled by a

metaanalysis of educational instruction that uses specific categories to provide guidance on classroom learning practices. Figure 1 shows the conceptual model of investigation group learning model developed on the basis of Marzano’s learning theory to improve students’ higher order thinking skills.



**Figure 1.** A conceptual model of investigation group based on Marzano’s instructional framework

*3.1.1. Social studies’ learning instruments applying the investigation group learning model based on Marzano’s instructional framework*

After developing the model, the next step is to develop learning instruments. Developing learning instruments aims to provide an overview and empirical analysis of hypothetical model that has been theoretically constructed. The learning instruments developed are:

*3.1.1.1 Syllabus.* The syllabus developed contains basic competencies, learning materials, learning activities, indicators, and assessment technique. There are two basic competencies set to implement the investigation group learning model based on Marzano's instructional framework, namely; 1) analyzing the effects of social interactions in different spaces on socio-cultural life as well as the development of national life, and 2) presenting the analysis results of the effects of social interactions in different spaces on socio-cultural life as well as the development of national life.

*3.1.1.2 Lesson Plan.* The lesson plan is arranged for three meetings with time allotment of 3x2H. The objectives set in this learning activity are: 1) understanding the concept of plurality; 2) describing several examples of differences in religion, culture, ethnicity, and occupation that can be found in media or students' environment; 3) identifying the plurality of socio-cultural life in Indonesia; 4) describing the factors influencing plurality in Indonesia (religion, culture, ethnicity, and occupation); 5) describing the citizens' attitude towards the plurality of the nation; 6) presenting papers on the plurality of socio-cultural life in Indonesia; 7) presenting and providing examples of types of plurality in Indonesia; 8) presenting the factors influencing plurality in Indonesia (religion, culture, ethnicity, and occupation); and 9) applying the positive attitude towards the plurality of the nation.

*3.1.1.3 Teaching Materials.* The teaching materials are arranged based on the topic of plurality relating to the diversity of Indonesian society.

*3.1.1.4 Observation Sheet of investigation group learning model based on Marzano's instructional framework.* The observation sheet is arranged with the purpose to see teacher's and students' activities in the teaching and learning process. The observation sheet consists of preliminary, core, and closing activities. The activities observed are the learning stages, the class dynamics, and the assessment techniques. The learning and the students' activities are assessed by using a check list with a score of 1-4. The aspects assessed in students' observation sheet are collaboration in groups, expressing opinion and questions, answering questions, and expressing ideas for real action.

*3.1.1.5 Observation sheet of critical thinking skills.* The observation sheet of critical thinking skills is arranged to assess students' critical thinking skills in the teaching and learning process. The observation sheet consists of four main aspects, namely expressing opinions, analyzing problems, providing solutions, and designing concrete actions. The students' critical thinking skills are assessed by using a check list with a score of 1-4.

*3.1.1.6 Observation sheet of creative thinking skills.* The observation sheet of creative thinking skills is arranged to assess students' creative thinking skills in the teaching and learning process. The observation sheet consists of four main aspects, namely asking as many questions as possible, expressing causes of various events, describing possibilities that may occur, and creating a new and unique product design. The students' creative thinking skills are assessed by using a check list with a score of 1-4.

*3.1.1.7 Test of critical and creative thinking skills.* Test of critical and creative thinking skills is arranged to assess the development and improvement of students' critical and creative thinking skills after the learning activities. The test consists of 44 complex multiple choice questions regarding the plurality of Indonesian society. The tests are given at the beginning and at the end of learning activities to see the improvement of students' critical and creative thinking skills after learning with the investigation group learning model based on Marzano's instructional framework.

*3.2. Design and validation of the investigation group learning model based on Marzano's instructional framework*

The hypothetical model contains a conceptual framework that was further developed in learning syntax. Both the model and the learning instruments are validated by four validators. Concerning the learning model, there are six aspects validated by the validators, namely usage guideline, clarity of conceptual framework, clarity of model's syntax, clarity of model's objectives, possibility to be used by teachers, and suitability with the principles of model development. The result of the validity test showed that the model can be used with minor revision suggested by the four validators. Then, these improvements become the materials for establishing a valid learning model which can be used as a reference in arranging learning instruments.

Moreover, in terms of learning instruments, the validation results of the syllabus, the lesson plan, the teaching materials, the observation and the test indicated that most of the rated aspects are in the "Good" category meaning that the syllabus, the lesson plan, the teaching materials, the observation and the test can be used in learning activities.

Thus, based on the processes and procedures implemented, the development of the investigation group learning model based on Marzano's instructional framework has met the standards of a learning process. This model has achieved the objectives of developing a learning model. The investigation group learning model based on Marzano's instructional framework emphasizes that higher order thinking skill is an integral part of education. Then, it is worth to note that critical thinking itself is one of the four characters that must be possessed by 21st century students, namely communication, collaboration, critical thinking, and creativity.

#### 4. Conclusion

The investigation group learning model based on Marzano's instructional framework is a combination of investigation group learning model and the Marzano's instructional framework that has the following characteristics: 1) based on constructivism theory; 2) oriented to problem solving activities by applying pluralism concept; 3) oriented to higher order thinking skills (critical and creative thinking skills); and 4) cooperative-collaborative activity settings. Based on the validity test, it can be concluded that the investigation group learning model based on Marzano's instructional framework is valid and relevant to be applied in social studies learning at junior high school level to improve students' higher order thinking skills. In addition to obtaining a conceptual learning model, this development also created learning instruments, namely syllabus, lesson plan, teaching materials, observation sheet of critical and creative thinking skills, and test of critical and creative thinking skills that can be used in social studies learning at junior high school level especially on the material of Plurality. Considering that the purpose of education in general is to improve students' skills, so the investigation group learning model based on Marzano's instructional framework can present effective learning criteria.

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