

## Developing Creative, Innovative, and Polite Learning Model

**Prof. Dr. Sunandar, M.Pd.  
Muhtarom, S.Pd., M.Pd.  
Sugiyanti, S.Pd., M.Pd.**

Lecturers of Mathematics Education Department Universitas PGRI Semarang, Indonesia  
Correspondence address: Jl. Sidodadi Timur No. 24 Semarang Indonesia  
email: rukni@gmail.com

### ABSTRACT

The aim of this study was to develop Kreatif, Inovatif, dan Santun (KIS) learning model or creative, innovative and polite learning model in order to give positive impact on students' character and to improve students' problem-solving ability. This study concerned with "*library report, documented paper*" involving five steps namely choosing a topic, gathering information, evaluating teaching materials, organizing ideas and writing the manuscript.

Before developing the model, literature study and field study were conducted. The literature study which was conducted by the researchers, including the analysis of the conceptual framework based on curriculum 2013, creative learning, learning that can foster students' innovation, and polite learning. The field study was aiming to raise the fundamental problem needed in the design of developing KIS learning model and learning tools of junior high school mathematics.

The main problem that attempted to be solve was that students tend to be passive in learning process. Accordingly, it caused the low level of students' creativity, innovation and problem-solving skill. Afterwards, we developed the design of KIS learning models which consists of lecturer modeling, posing and identifying problem, acquising ideas, formulating the best ideas, presenting ideas, evaluating ideas and follow-up. Every step of the KIS model is important to reach the learning goals. Therefore, those six steps were designed interrelated to each other.

Keywords: developing, KIS model

### 1. INTRODUCTION

The background of this study is the explanation of the Indonesian Ministry of Education, Mohammad Nuh, which described that the challenge of curriculum 2013 is that all subjects taught in schools have to contribute to the establishment of students' attitude, skill, and knowledge. Furthermore, it also explained that how far the topics in a subject should be taught in school must be in line with the international standard, which means that it must go to the level of reasoning. Hence, students will be able to reach the higher level than the results of PISA 2013 and TIMMS 2011.

According to the framework competency in the 21<sup>th</sup> century (Nuh, 2013), a learning must be able to establish a situation which lead teachers to collaborate and push students to learn something which has connection to their daily life contexts. Therefore, a learning process must be able to

create innovative and creative students. Furthermore, Su'ud, et al (2001); Nuh (2013) argue that innovative, creative, and smart skill can be gained in the activities of observing, questioning, associating, and experimenting. If this learning can be conducted well, the characters of independent, creative, responsible, and nationalism insight will be established afterwards.

Therefore, a learning must be directed into activities which encourage students to learn actively in psychological, physical, and social aspects. The main and determined duty of a lecturer is guiding students to study meaningfully and to learn solving problems. Hence, students will have skill needed for their life in future. The benefit of problem based learning is to practice designing a finding, to stimulate thinking and doing creatively, and to stimulate the development of students' thinking to solve problems effectively (Posamentier and Krulik, 2009: 2). Absolutely, this is in line with the challenge and perspective of curriculum 2013.

Based on the above explanation, the University of PGRI Semarang needs to develop and conduct a learning which give prospective teachers skill to do their duty as professional teachers. For example by the course of Matematika SMP or Mathematics for Junior High School. However, this situation is sometimes difficult to be conducted because a clear design, supportive learning tools, and an appropriate format of evaluation are not available yet. Therefore, it is necessary to conduct a study of developing the KIS learning model to give positive impact on students' character and to improve students' problem solving skill.

## 2. RESEARCH METHOD

This study refers to "*library report, documented paper*" (Purnomo, 2006), this method consists of five steps namely 1) Choosing the topic of developing a creative, innovative, and polite learning model; 2) Collecting information from journals, relevant textbooks, interview with teachers, and observation of learning activities in Junior High School; 3) Evaluating topics which is conducted to choose the relevant topics supporting the development of KIS learning model; 4) Organizing ideas which means organizing logically ideas directed to the conclusion to become the "out line" of KIS learning model involving syntax model, social system, reaction principal, supportive system, and instructional effect; 5) Writing report based on the four steps mentioned previously.

## 3. RESULTS AND DISCUSSION

### 3.1. Literature Study and Field Study

Literature study conducted by the researchers consists of conceptual framework analysis of the learning activities based on curriculum 2013, creative learning, learning which can stimulate students' innovation, and polite learning. Besides that, in the literature study, we also conducted a study of supportive theories about problem solving skill. The field study aims at emerging the main problem needed in developing KIS model and the learning tools of mathematics in Junior High School. The main problem which need to be developed in the learning activities is that the students who tend to be passive in learning process. It cause the low level of creativity, innovation, and

students' problem solving skill. In this stage, we conduct curriculum analysis of the curriculum 2013, students' textbooks, teachers' textbooks, and the relevant theories. From that studies, we get the overview of learning approach which can become the solution of the main problem mentioned before. In this study, the researcher choose KIS learning model to improve students activities in learning process and to increase the Junior High School students' problem solving skill in learning mathematics.

### 3.2. The Planning of Developing KIS Model

Every step in KIS model is important to reach the learning goals. Consequently, six steps designed are interrelated to each other. The steps of KIS model are lecturer modelling; posing and identifying problems; acquiring ideas; formulating the best idea; presenting ideas; evaluating ideas and follow-up, respectively. The syntax of KIS model are completely described in Figure 1.

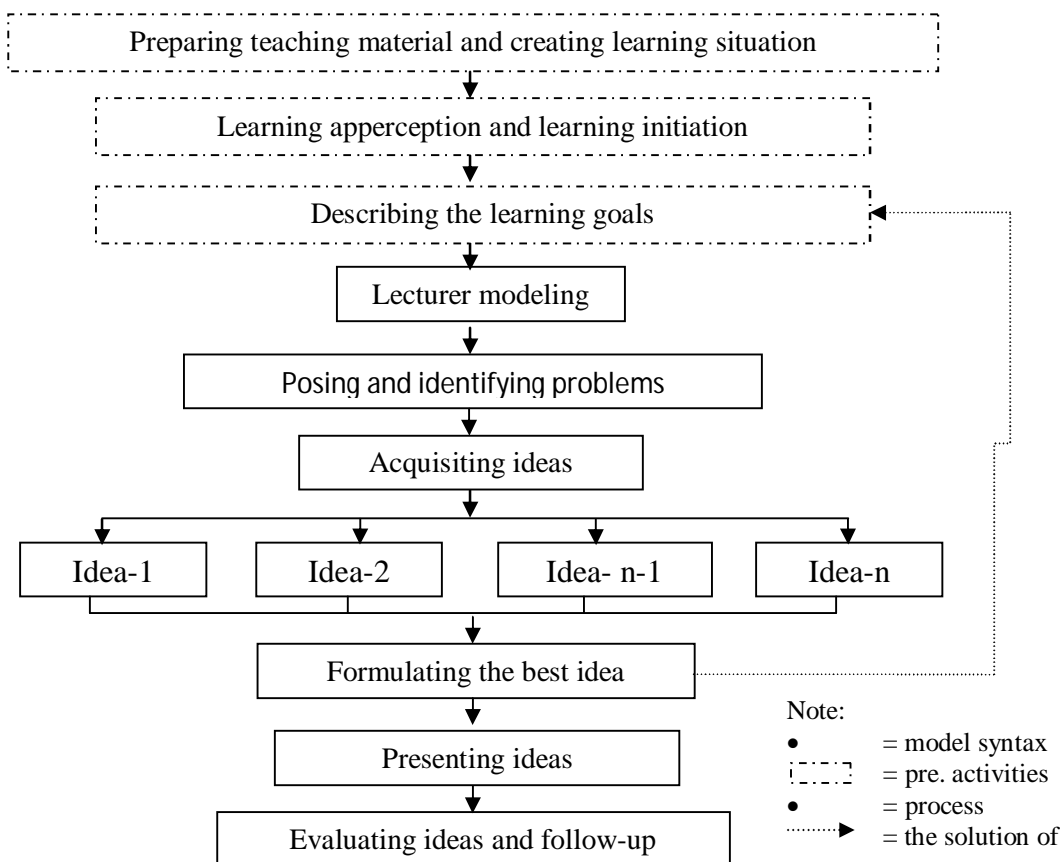


Figure 1. Desain Syntax KIS Model

### 3.2.1. The syntax of KIS model

Every step of KIS model is important to reach the learning goals. Therefore, the six steps are designed interrelated to each other. The steps of KIS model are lecturers modelling; posing and identifying problems; acquiring ideas; formulating the best idea; presenting ideas; evaluating ideas and follow-up, respectively.

**The first step** is lecturer modelling which is done by giving examples related to the learning goals. This is designed to catch students' interest and to show to students that the lecturer understand and able to conduct an educated learning activities. According to the general dictionary of Bahasa Indonesia (2000: 619), *keteladanan* or providing model is something as an example which can be imitated. Model has a big influence and plays important role in someone's personality. However, a model need to be evaluated whether it is good or not before children do the same thing. Models can also be interpreted as the attempt did by someone consciously reflected by the attitude and actions to reach the goals. The success can be measured by the changes of someone's attitude which make he/she as a role model harmoniously with the determined goals (Utami, 2000). Within this model, it is expected can develop the characters of creativity, innovative, and polite attitude in learning process.

**The second step** is posing problems and identifying problems. This step aims at emerging students' curiosity and interest to solve problems posed by the lecturer. In order to stimulate curiosity and interest in learning, students should pay attention (the first step). Piaget said that someone will be more challenged to face new problems and experiences than scheme which they have been had. In other words, there is a process of integrating a new stimulus through changing the old scheme or creating the new scheme to be appropriate with the received stimulus, so that the old scheme should be adapted or changed to be appropriate with the received stimulus through accommodation process.

The accommodation will happen if students can not assimilate the new experience with their scheme. This happen because the new experience does not suit with the existing scheme (Suparno, 2001). Milnick (1974) described that accommodation is the modification of existing structures according to the demands of the environment. The received stimulus might not suit with the old scheme. Hence, the old sheme have to be adapted or changed in order to be suited with the received stimulus. Qayumi (2001) stated that accommodation is changing existing information to include new information.

Accommodation can also be called as a changing radically concept which needs several conditions: 1) there is unsatisfying with the existing concept, 2) the existing concept have to be understood, rational, and can solve new problems or phenomenon, 3) the concept must be rational, can solve the old problems, and consistent with the existing theories or knowledge (Suparno, 2001). In the process of accommodation to the structure of a new problem, someone's sheme is developed in line with the diversity of problems they deal with. Therefore, there are also new various schemes formed which at the end, can emerge creative ideas to solve problems.

**The third step** is identifying ideas. The aim of this step is to give opportunities to students to learn how to get ideas (constructivist) through scientific activities. In this step, students work in

collaborative group to identify ideas, to arrange argument, and to answer problems posed in the third step. This refers to Cobb (1994) argument which suggested that personal constructivism should be combined with sociocultural constructivism. In the perspective of personal constructivism, it highlights on how a student form a scheme (interwoven concepts that exist in the mind), develop a scheme, and change a scheme. He emphasize more on how people by themselves construct knowledge as the result of their interaction with their experiences and objects they face, and on how children do simple or reflective abstraction in constructing their mathematical knowledge. Whereas, sociocultural constructivism more concern on the perspective that people do construct knowledge. This means that learning need a process of actively personal building and a process of inculturation in society.

**The fourth step** is formulating the best idea. This step is designed to describe firmly the importance of scientific argumentation skill for students. This step is also help students to develop good arguments, whether proofs can be used to support problem solving or not. This is because it is rarely that students connect arguments with proofs and use data to support proofs when answering questions. Moreover Shemwell & Furtak (2009) explained three important characteristics which should be noticed in scientific argumentation. First, priority is given to proofs as the basic to firmly state the falidity of claim. Second, argumentation is a social process of sharing a certain number of ideas which are focused to the different perspectives of people. Third, argumentation aims at building and completing explanation.

**The fifth step** is presenting ideas. In this step, each group is given an opportunity to deliver their ideas and arguments to other groups and other groups will give comments about the arguments delivered. Students will be more interested when they are given an opportunity to deliver their ideas to other groups, respond other students' questions, describe the proofs of their ideas and evaluate the benefits of sharing ideas. The argumentation step is designed in order to make students experience a social interaction, intlectual freedom, respect each other, so that students can develop creative ideas, innovation, critical thinking, and the characters of honest, polite, careful, and tolerant in learning processes. In this step, the role of a lecturer is guiding and facilitating the learning process.

**The sixth step** is evaluating ideas and further steps. This steps is designed in order to make students have opportunities to give feedbacks to the whole learning process and the results of solving problems which have been agreed together, so that it will help students to develop their metacognitive ability. In the end of this session, the lecturer give feedback by giving correction and affirmation to the results of solving problems and arguments which have been agreed, so that students can understand well in line with the learning goals. Finally, students are asked to make an innovative creation based on the agreed ideas, for example designing media, learning materials, and worksheets.

### **3.2.2. Social System**

Social system describes the role of students and the lecturer, the interaction among students, the interaction between the lecturer and students, and the expected target. In KIS model, the

learning is students centered and the lecturer have a role as a facilitator, a guide, and a mediator. As a facilitator, the lecturer have to provide learning sources, motivate students in order to keep spirit in learning, manage and encourage students in order to make the learning activities can be well conducted. As a guide, the lecturer have a role as a place to ask when students experience difficulties, the lecturer can give support, guidance, and instructon in order to make students can solve problem and make sure that all activities are well done by students. As a mediator, the lecturer have to be a certain number of activities which stimulate students to built arguments with facts or data, the lecturer lead the discussion in the session of ideas presentation and the lecturer has a role as a judge if there is disagreement in the discussion process.

### 3.2.3. The Principle of Reaction

The principle of reaction is the guidelines of the lecturer to respond students' performance during learning activities. The prinsiple of reaction is related to how the lecturer respect and respond including how the lecturer pose questions, answer questions, and respond what students do. In KIS model which characteristic is students centered, students are the source of activities and information, so that the role of the lecturer are more consultative and students are the decision maker. Therefore, the lecturer have to frequently give opportunities to students to pose questions when they experience difficulties in constructing solving problems. The lecturer have to give sufficient support to students who experience difficulties, for example by posing questions to other students or supporting by giving guided questions to students who experience difficulties, so that their thinking to solve problems are helped.

### 3.2.4. Supportive System

In order to make KIS model can be applied, it is needed to provide a suportive system. The supportive system is an additional condition of model beside skill, power, and routine capability. This additional condition can be phisical an non phisical things. Learning tools and learning sources can be categorized as phisical condition. Learning tools and learning sources which are needed to implement KIS model are:

- a. Course syllaby
- b. Course planning and schedule
- c. Students' books
- d. Students' worksheets
- e. Learning media which is powerpoint
- f. Assessment instrument to measure the learning performance
- g. Learning observation sheet

Non phisical condition namely: a) psychologically students are ready to receive lectures, b) students are in conducive environment, c) the lecturer are able to manage learning, d) there is a good communication between the lecturer and students.

### **3.2.5. Instructional effects**

Instructional effects can also be called as direct effects or effects which intentionally designed as the results of instructional activities. Instructional effects usually design to measure the performance of the determined basic competence. Whereas, side effects can also be called as indirect effects or effects which are gained because of the learning environment created by a model. In the development of KIS model, instructional effects can be used to assess the quality of models empirically, which means whater a model developed has been resulted the expected effects. The instructional effects of KIS model can be described as follows.

- a. Students understand, apply, analyze mathematics knowledge based on their own experiences
- b. Students are able to apply mathematics knowledge to solve problems
- c. Students have discussion skill

The side effects which are expected in learning activities through KIS model are described as follows.

- a. Students have high motivation in the learning process.
- b. Students have creative thinking skill, innovative, and polite attitude during the learning process.
- c. Students have cooperating skill and are able to work with their fellow students. Students are able to respect other people's opinions.
- d. Students have communicating skill.
- e. Students have the characters of independent and responsible in solving problems.

## **4. CONCLUSION**

The design of KIS learning model consists of lecturer modelling; posing and identifying problems; acqisiting ideas; formulating the best idea; presenting ideas; evaluating ideas and follow-up. Every step of KIS model is important to reach the learning goals. Therefore, those six steps were designed interrelated to each other.



## REFERENCES

- Cobb, P., Yackel, E., & Wood, T. (1992). A constructivist alternative to the representational view of mind in mathematics education. *Journal for Research in Mathematics education*, 2-33.
- Departemen Agama Republik Indonesia. 2012. *Al-Quran dan Terjemahannya*. Jakarta: Departemen Agama Republik Indonesia.
- Melnick, S. D. (1974). Piaget and the Pediatrician Guiding Intellectual Development. *Clinical pediatrics*, 13(11), 913-918.
- Munandar, Utami. (1999). *Mengembangkan Bakat dan Kreativitas Anak Sekolah (Cetakan ketiga)*. Jakarta: PT. Gramedia.
- Nuh, Mohammad. 2013. *Kurikulum 2013*. Paper presented in curriculum 2013 socialization and the Building Inauguration Post Graduate Teachers' Training IKIP PGRI Semarang.
- Posamentier, A. S., & Krulik, S. (Eds.). (2009). *Problem solving in mathematics, grades 3-6: powerful strategies to deepen understanding*. Corwin Press.
- Purnomo, Harsoyo. 2006. Papers in Scientific Writing Training for Students, Student Activity Unit of Scientific Studies and Research Student Teachers' Training IKIP PGRI Semarang on 6 and 8 November 2006 Scientific Writing Studies Reader (Research Paper).
- Shemwell, J. T., & Furtak, E. M. (2009). *Argument-Driven Formative Assessment for Conceptual Science Learning*. California, The Annual Meeting of The American Educational Research Association. Tersedia dalam, [http://spot.colorado.edu/~furtake/AERA Argument Driven Formative Assessment\\_final\\_3\\_20\\_09.pdf](http://spot.colorado.edu/~furtake/AERA_Argument_Driven_Formative_Assessment_final_3_20_09.pdf)
- Suparno, P. (2001). *Teori Perkembangan Kognitif Jean Piaget*. Kanisius.
- Su'ud, Abu., et al. (2011). *Pendidikan Karakter di Sekolah dan Perguruan Tinggi*. Semarang: IKIP PGRI Press.
- Qayumi, S. (2001). Piaget and his role in problem based learning. *Investigative Surgery*, 14(2), 63-65.