DEVELOP MODEL TASC TO IMPROVE HIGHER ORDER THINKING SKILLS IN CREATIVE TEACHING

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Abstract

The new curriculum requires learning paradigm transformation, from the monotonous and conventional learning (teacher centered) into active learning (student centered), innovative, creative, and requires transformation from lower order thinking skills into higher order thinking skills. Higher order thinking skills are part of 21st century skills. One alternative to improve higher order thinking skills is to develop a learning model TASC (Thinking Actively in a Social Context) that can be applied by teachers for senior years students to improve higher order thinking skills. Actually, TASC is a commonly used model for early years students in social and language subjects. The latest survey conducted by Belle Wallace in 2007 showed more than 10,000 classes in the UK have used the TASC to improve the ability of problem solving and thinking skills of students. This research is focussing to develop model of TASC using development model 4-D type, which begins with a needs assessment in several high schools in Yogyakarta. This research will conducted in January 2015 through February 2015. Based on the results of the needs assessment then developed the new breakthroughs model of TASC in science subjects for senior years students that believed can increase the higher order thinking skills in creative teaching.

Keywords: *higher order thinking skills, TASC model, development model type 4-D*

INTRODUCTION

Thinking skills is defined as a person's ability to process all the information both in solving a problem, planning, or creating something (Editor, 2006: 3). Humans are born with thinking skills, thinking skills born through a process called learning. Through thinking and learning students get a more complete understanding and can even infer something meaningful. If the higher order thinking skills of students are under the average then this becomes a major problem that must be solved immediately.

As a step to determine the quality of students in aspects of science for senior years students, their performance at the national or international level can be seen as a benchmark. Achievement at the national level which disclosed the results of research by Edi Istiyono (2014) show that higher order thinking skills of students in 11th grade of High School in Yogyakarta is not satisfactory, ie 49% of students are below average skills. While the achievement at the international level, according to data Program of International Student Assessment (PISA), the science aspect of Indonesia was ranked 38th in a row in 2000 and 2003 with a score of 393 and 395, and ranked 50th in 2006 with a score of 393. It shows that the average Indonesian science achievement scores are significantly below the international average score set at 500. the same thing is also demonstrated by an international study into the cognitive abilities of students in math and science that TIMSS (Trends in Mathematics and Science study) held by the IEA (International Association for the Evaluation of Educational Achievement). The results of TIMSS 2011 in science showed Indonesia scored

406 where this value is below the international average is 500. According the two achievements at the international level, it is clear that student's higher order thinking skills still needs to be improved.

Based on the analysis of need assessment through student questionnaire at six schools in Yogyakarta with the intermediate level categories based on the ratings of the National Exam in 2014, showed that the average percentage of the higher order thinking skills of students in 10th and 11th grade MIA is approximately 71.38%. Ideally the average percentage of the higher order thinking skills in the range of 80%. Other than that, the results of the analysis of needs assessment through questionnaires of teachers, namely 1) In the preparation of indicators of learning, 100% of teachers believe that identifying basic competence to construct a model is important and 82% of teachers had to apply model-based thinking skills, inquiry and problem solving that is a basic of TASC model; 2) In the implementation of learning indicators, 97.8% of teachers have applied a scientific approach in the learning process and they often use a variety of learning models to simplify the understanding of the students in understanding the subject matter; 3) In reflecting on learning indicators, 100% of teachers agreed to motivate students to reflect on the attitude of knowledge into everyday life; 4) Application-oriented learning in higher order thinking ability has been adopted by 83.7% of teachers but only 26% of teachers already know TASC model; 5) 100% of the teachers are willing to apply the learning model TASC.

Most of the research in the education journal only apply TASC model in social or Language subjects. Actually, if it is investigated more deeply, this model very well when applied in the science subject for senior years students because the TASC based on Vygotsky's constructivist theory which states that intellectual ability is not just based on experience alone but also of social interaction as its main proponent

THINKING ACTIVELY IN A SOCIAL CONTEXT (TASC)

Thinking Actively in a Social Context (TASC) is a learning model developed by Belle Wallace. Wallace (2000) said that TASC is universal, it means that can be used for a variety of learning, inclusive, to help the process of problem solving, as well as stimulate thinking skills. TASC is based on the brain's ability to receive and forward stimuli through the nervous system that affects the success of learning.

Sekar, P.K (2014: 7) claims that TASC has four forming elements which are the basis of the ability to think and problem-solving. Thinking, thinking is a dynamic process that is continually made by students, aims to enable students to continue to develop the capacity to think, especially higher order thinking skills. Actively, aims to enable students to actively understand, figure out, and the expression of their learning experiences. Social, as social beings, this model aims to enable students to undertake interaction, share knowledge, and work together so that all students have equal opportunities in learning and knowledge that obtained are more varied. Context, by learning to build thinking skills and problem solving aims to enable students to have a strong basic concepts and set of real experience experienced by students in the learning environment. Anything that includes the ability to think effectively contained in the model which are presented in the form of TASC problem solving wheel. Before using TASC, first students were given a description of the wheel which is the flow of the problem solving of TASC. This is intended to allow students to remember and apply the methods that they design themselves. The scheme of the wheel which is the logic of TASC as follows:

Figure 1.
Troubleshooting TASC wheel pattern (Sekar, PK, 2014: 6)

HIGHER ORDER THINKING SKILLS

Many expert opinion classifying which includes higher order thinking skills. Experts who laid the foundation of the theory of higher order thinking skills, among others, Piaget, Bruner, Bloom, Gagne, Marzano, Glaser, Vygotsky, and Haladyna. According to the revised Bloom, which includes higher order thinking capabilities include analyzes (C4), evaluating (C5), and create (C6) with a note that already mastered the ability to remembering (C1), understanding (C2), and applying (C3). Ability to analyze (C4) according to Krathwohl is the ability to separate the knowledge into sections and then identify the parts that relate to each other. The ability to evaluate (C5) is the ability to match the knowledge which obtained or works made with a criteria (Krathwohl, 2002: 214-215). The three categories of higher order thinking (C4, C5, and C6) generally appears when triggered by cause such a face a new problem, the uncertainty of something, or a dilemma. One way to stimulate students' higher order thinking skills is the way its exposes students to a question and the unusual task they received previously. This is where the teacher plays an active role in facilitating and stimulating students. Success or failure is influenced by the ability of students to apply and modify the way of thinking (King, Goodson, & Rohani, 2009: 1-20).

RESEARCH METHOD

Development model of this research adapted from 4-D type developed by Thiagarajan (1974) namely, define phase, design, develop, disseminate with little change in phase due to disseminate the resulting products only to one school, but did not dismiss if there are other schools that are interested in using this product. Broadly speaking, the development procedure described as follows.

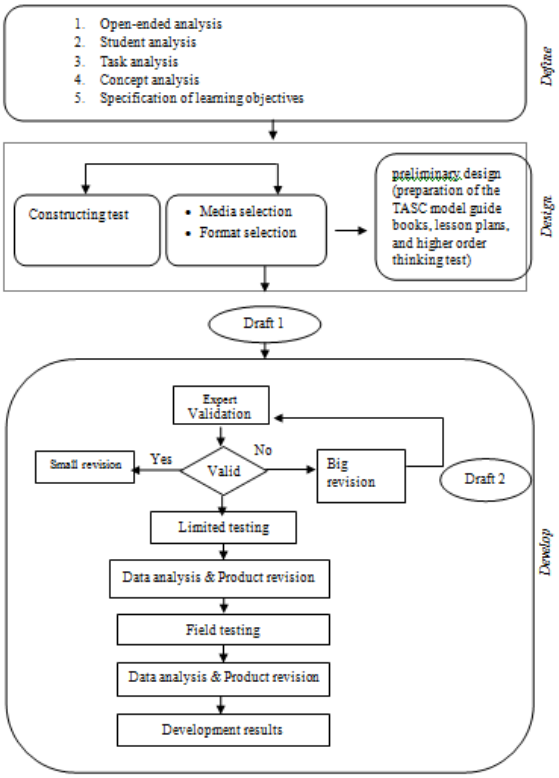

Figure 2
Stages of Product Development

Trials design in this research consisted of three stages: expert validation (expert judgment), limited testing, and field testing.

1. *Subjects*

The subjects were students in 11th grade of SMAN 6 Yogyakarta which consists of three classes, 11th grade of MIA 1, 11th grade of MIA 2, and 11th grade of MIA 3. Subject test in the first stage or a small-scale testing involving 10 students of XI MIA 1. While the second phase of the testing subject or field testing involving two classes consists of 60 students from 11th grade of MIA 2 and 11th grade of MIA 3 were conducted in January 2015 through February 2015.

2. *Techniques and Instrument*

Data obtained from this study is qualitative and quantitative data. Quantitative data obtained from the scores given by the validator, the teacher assessment scores, student assessment scores on the learning model Thinking Actively in a Social Context (TASC), a score from implemented learning, as well as higher order thinking skills student test scores. Qualitative data obtained from the quantitative data conversion. Data collection instrument in this study consisted of (1) validation sheet, (2) practicality assessment sheet by teachers and students, (4) observation of the implemented syntax sheet, and (5) higher order thinking test. The data obtained were used to determine the validity, practicality and effectiveness of the developed product. All of these three criteria refers to the criteria of product quality proposed by Nieveen (1999).

3. *Data Analysis Techniques*

The results of the data analysis obtained from experts and practitioners are used to determine the validity of the resulting product in terms of theoretical and consistency among the components of the developed product. The results of the data analysis from field testing are used as a basis to determine the practicality and effectiveness of the

developed products.

For this purpose it is necessary to see conversion table. Conversion table is made by convert the assessment scores from experts, teachers/practitioners, and students become standard scale of five grades. For this purpose used benchmark adapted from Saifuddin Azwar (2010: 163) as presented in the following table.

Tabel 1
Converting Qualitative to Quantitative Data

Interval	Criteria
$Mi + 1{,}5SBi < M$	excellent
$Mi + 0{,}5SBi < M \leq Mi + 1{,}5SBi$	good
$Mi - 0{,}5SBi < M \leq Mi + 0{,}5SBi$	good enough
$Mi - 1{,}5SBi < M \leq Mi - 0{,}5SBi$	low
$M \leq Mi - 1{,}5SBi$	bad

Explanation:
M = Actual score
Mi = 1/2 (maximum score + minimum score)
Mi = 1/6 (maximum score + minimum score)

Before performing experiments using the control class and the experimental class, firstly the data from first semester exam results of students analyzed to determine whether students' skills before treatment between the experimental class and the control class together are the same (for controling variables). Then performed the prerequisite test of Kolmogorof-Smirnov to see normality and Levene's to see homogeneity. Both of these prerequisites test using statistical software with SPSS 21. Gain scores (positive difference score between pretest and posttest) of higher order thinking skills is used to determine whether there is an increased higher order thinking skills after learning process using TASC model.

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