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The Development of Deconstructive Learning History Model to Promote the Higher Order Thinking Skill of University Students

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Abstract

The presented research develops a deconstructive learning history model to promote the Higher Order Thinking Skill (HOTS) of university students. According to Thiagarajan, Semmel, & Semmel's (1974) approach, the model was developed in four stages: defining, design, development, and dissemination. The research participants were 120 students of the History Education Department, Sebelas Maret University, Indonesia. The authors found the main problems related to the aspects of chronological thinking, students' passive attitude, and the availability of learning path. Based on those problems, the author designed a deconstructive learning history model, consisting of four learning stages: problem statement, deconstruction, construction, and articulation. At the development and summative evaluation stages, the learning model proved feasible and effective in promoting the HOTS, thus, the learning model can solve the problems of time orientation and students' passive attitude. Considering the findings and results of the research, the authors state that the learning model becomes a decisive factor in provoking students to reach the higher cognitive level in Bloom's taxonomy.

Keywords: *higher order thinking skill, learning history, learning model, deconstructive*

Introduction

One of the primary objectives of the higher education learning system in the 21st century is to develop students' higher order thinking skill (HOTS) (Collins, 2014). The HOTS can be defined in the framework of the cognitive level of Bloom's taxonomy (1965), which later was revised by Anderson and Anderson (2001). The HOTS is achieved when the student has reached three high levels in the cognitive domain: analyze, evaluate, and create (Yen & Halili, 2015).

In learning history, the HOTS is similar to the concepts of historical thinking and history reasoning skill (Drie & Boxtel, 2007; Ercikan & Seixas, 2011). Some researchers dealing with the development of the process of learning history, have developed their own concepts, either intertwined or unrelated to Bloom's framework.

Seixas, Morton, Colyer, and Fornazzari (2013) constructed six levels of historical thinking, encompassing establishment of historical significance, using primary source evidence, identifying continuity and change, analyzing cause and consequence, taking historical perspectives, and understanding the ethical dimension of historical interpretations. In the same spirits, Masood, and Abdullah (2016) adapted Bloom's taxonomy for assessment purposes in learning history. They generated six levels of taxonomy encompassing example, pre-structural, uni-structural, multi-structural, relational and extended abstract.

Although the HOTS has been described theoretically, in many practical cases the HOTS is hard to achieve. Weay and Masood (2014) stressed the problem in promoting the HOTS, which ironically lies on the time orientation paradigm of teachers and students, which emphasizes memorizing the chronological facts. Meanwhile, Seixas (2017) mentioned local problems, which relate to the differences of temporal orientation, learning environment conditions, and the uniqueness of students and teachers.

In facing those problems, some researchers have been trying to promote the HOTS by developing the role of teachers (Dorren, 2004), students' activity (Pattiz, 2004), student examination (Demircioglu, 2009), or students' educational experiences (Kim & Seo, 2015). Meanwhile, Drake and Brown (2003) suggested a systematic way by emphasizing the enrichment of learning material and using more than one book reference to present more perspectives in the classroom.

Following those endeavors, this research takes another approach by designing a deconstructive learning history model. The basic idea is to transform Bloom's taxonomy into a learning model that consists of classroom practice and student activities. Following Joyce, Weil, and Calhoun' (1972) work, the authors believe

that the learning model will become one of the exponents in the development of the HOTS. The design of learning stages should support students in mastering each level of the taxonomy by providing a learning path.

Research Method

The design of the instructional development by Thiagarajan, Semmel and Semmel (1974) was adopted to develop a deconstructive learning history model. The authors modified the design according to the local conditions and research purposes. At the defining stage, the authors focused on the problems and analysis of student characteristics related to their level of HOTS. The design stage was focused on generating the prototype of a deconstructive learning history model in the form of learning stages. The development stage consisted of two steps: expert appraisal and developmental testing. Small group and large group testing was used in the developmental testing to measure the feasibility and consistency of the learning model. The last stage was dissemination, consisting of summative evaluation to prove the effectiveness of the learning model in promoting the HOTS of students.

The research participants were 120 students of the History Education Department, Sebelas Maret University, Surakarta, Indonesia. The data were collected with the use of interviews, open questionnaires, feasibility forms, and HOTS test. At the defining stage, 30 students were interviewed and asked to fill the questionnaire in order to find the problems and contextual factors that influence the level of students' HOTS. At the development stage, a feasibility form was used to collect responses from experts and students in expert appraisal, small group testing, and large group testing. The feasibility form consisted of the holistic indicator of the learning model arranged by Joyce and Weil (1972), encompassing learning stages, social system, lecturer and student roles, supporting system, and nurture effects. The feasibility of the prototype was measured according to the following criteria:

Table 1. Product Feasibility Criteria

Range	Criteria
3.26–4.00	Very feasible
2.51–3.25	Feasible
1.76–2.50	Feasible enough
1.00–1.75	Not feasible

In the summative evaluation, 60 students were involved to measure the effectiveness of the learning model. They were divided into a control group and an experimental group, each group consisted of 30 students. At this stage, a HOTS test was used with t-test analysis to measure the effectiveness of the learning model. The HOTS test was designed by the authors following the revised version of the cognitive levels of Bloom's taxonomy, the six-levels of historical thinking, and the adaptation of Bloom's taxonomy in learning history. The authors then generated the indicators into a questionnaire and validated it by the SPSS 17.0 program.

Research Findings and Results

The Findings of the Defining Stage

The authors found several student characteristics in the classroom. The majority of the students mostly recite historical data and information that was presented during the learning process as the construction of their historical argumentation and reasoning. They have an assumption that all of the historical data, which were presented in the classroom, were generally true. Other students not only reiterate but also try to use historical data, whether partially or fully, to construct their historical argumentation and reasoning. However, the students have a tendency to emphasize the chronological aspect of the historical events explanation. The authors also found that few students are able to produce argumentation or historical reasoning based on their analysis and evaluation of historical data. Based on those data, the authors emphasise that the differences in the students' abilities are affected by how the students organize their existing as well as new knowledge during the learning process.

The Design Stage

The findings of the define stage become an empirical foundation to design the deconstructive learning history model. The framework of the prototype of the learning model was generated from Bloom's revised taxonomy (Anderson & Anderson, 2001), the six levels of historical thinking (Seixas, Morton, Colyer, & Fornazzari, 2013), and the adaptation of taxonomy in learning history (Weay, Masood, & Abdullah, 2016). Vygotsky's (1986) approach, particularly the concept of scaffolding, was adopted to design the social system of the learning model, in order to help the students to reach their zone of proximal development by

providing a space for collective discussion, problem solving, and articulate their finding in the classroom.

The authors also adopted problem-based learning (PBL) in contextualizing the learning model. PBL could improve the HOTS by posing present and complex problems to solve (Tan, Chye, & Teo, 2009; Duch, 2001), which in the context of learning history must be interrelated with historical events (White, 2008). Meanwhile, the deconstruction approaches of Derrida (1997) and the concept of continuity and discontinuity of Foucault (1972) were adopted as a tool of the heuristic phase to analyze the genealogy of the present problems in the past. It affected the design of the learning stages that emphasize the profound analysis of genealogy of problems in order to find a new concept or argumentation from its process. The prototype of the deconstructive learning history model is as follows:

Table 2. Prototype of Deconstructive Learning History Model

Learning Stages	Learning activities	Competences
Stage 1: Problem statement	• Lecturer explains present problems as the main topic of learning • Lecturer makes a link between the present problems and the past problems	• Remembering and understanding the concept of continuity and discontinuity
Stage 2: Deconstruction	• Students discuss the problems collectively • Students compare and analyze the problems in historical perspectives • Students find and describe roots of the problems	• Applying the concept of continuity and discontinuity • Analyzing similarities and differences between the present problems and past problems
Stage 3: Construction	• Students give critiques to the existing assumptions, perspectives, and concepts based on their findings • Students construct new assumptions, perspectives, and concepts in looking at the problems	• Produce new findings by evaluating old assumptions, perspectives, and concepts based on historical evidence and reasoning
Stage 4: Articulation	• Students articulate and share their findings with other students	• Acknowledge and take ethical aspect of the learning process

The Result of the Development Stage

The result of expert appraisal and developmental testing proved that the prototype is feasible. The average result of expert appraisal is presented in Table 3.

Table 3. The result of expert appraisal

Evaluation Aspect	Result average	Criteria
Learning Stages	3.0	Feasible
Social system	3.16	Feasible
Lecturer and student roles	2.73	Feasible
Supporting system	3.16	Very Feasible
Nurture effects	2.66	Feasible

After expert appraisal, the prototype was tested in small group testing and large group testing, in order to find the consistency of its feasibility. The result of small group testing and large group testing is presented in Table 4.

Table 4. The result of development testing

Evaluation Aspect	Result (Average)		Criteria
	Small Group Testing	Large Group Testing	
Learning Stages	3.25	3.5	Very feasible
Social system	3	3.25	Feasible
Lecturer and student roles	2.75	3.10	Feasible
Supporting system	3.25	3.5	Very Feasible
Nurture effects	3	3.10	Feasible

The result of expert appraisal and development testing has proven the feasibility and consistency of the prototype. It means the prototype could be tested for its effectiveness at the dissemination stage.

The Result of the Dissemination Stage

The post-test average score and independent sample t-test score of the control class and the experimental group have proved the effectiveness of the learning model. The results are shown in Tables 5 and 6 below:

Table 5. The post-test average score

	Groups	N	Mean	Std. Deviation	Std. Error Mean
High Order Thinking Skill	Control Group	30	33.17	1.913	.349
	Experimental Group	30	35.73	3.129	.571

The post-test average score showed differences between the control group and the experimental group. The mean of the control group (33.17) was smaller than that of the experimental group (35.73). It proved that the score of experimental group was better than that of the control group. The result of the independent sample t-test is shown in Table 6.

Table 6. The result of independent sample t-test

		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Difference
HOTS	Equal variances assumed	4.980	.030	-3.833	58	.000	-2.567	.670
	Equal variances not assumed			-3.833	48.030	.000	-2.567	.670

The result of the independent sample t-test proved that the control group and experimental group were not an identical population. It showed the sig. value of Levene's test for equality of variances was 0.030 < 0.05. The values proved that the deconstructive learning history model was effective in promoting the students' HOTS.

Discussion

The presented study discusses a common problem in the development of the HOTS, particularly in the subject of learning history. The student's challenge is to think beyond the chronological thinking and make connections among historical events in a wider contexts. The problem lies in how students organize their knowledge in its relation to time perceptions and historical sequences. This problem is similar to the time orientation problem found by Weay and Masood (2014) in the context of learning history in Malaysia.

Moreover, as stressed by Seixas (2017), the authors also found local problems related to students' passive learning attitude, which was constructed by the students' assumption of historical data in learning history. The students tend to acquire all historical data and do not have a path to retrace and organize all the

historical data acquired during the learning process. The facts that there were differences in the HOTS levels among the students in one classroom, as an epistemic community that intermingled and received the same knowledge, reflected the uniqueness and locality aspect in the development of HOTS. Furthermore, it reflects the importance of a learning path as the student's cognitive ability to organize their existing knowledge as well as their new knowledge that affects their cognitive level.

The presented study confirms the importance of the learning model in promoting HOTS. It means, as stressed by Collins (2014) and Budsankom, Sawaboon, Darongpanit, and Chuensiringmokol (2015), that the learning model becomes a fundamental aspect in developing HOTS. This can also be perceived in line with an attempt to transform Bloom's taxonomy into classroom practice in the form of the students' activities (Mulcare & Shwedel, 2017; Shalaby & Milad, 2017).

Our empirical study proved that the deconstructive learning model affects the level of students' HOTS. The result of the summative evaluation showed the effectiveness of the learning model in promoting students' HOTS. The learning model could solve the problems of time orientation and students' passive attitude. The learning model improves students' HOTS by providing learning stages that not only emphasize chronological perspectives but also critically force students to retrace historical data at each learning stage, from problem statement, through deconstruction, and construction, to articulation. In line with Duch (2001) and Pritchard and Woolard (2003), the present problem could be posited as the main topic in learning history to reverse the chronological thinking of the student. It is added to the concept of continuity and discontinuity as basic thinking to understand the past. Furthermore, the deconstructive and genealogical approaches are imparted as a heuristic component in the learning model and it proved effectively helpful to the students in the deep analysis of problems. In other words, the learning model acted like modeling for students' activity and a medium of scaffolding to achieve the HOTS of students.

In the context of education theory, this research continues Usher and Edward's (2003) and Walshaw's (2007) ideas to use Derrida's and Foucault's thought in the educational field. They theoretically focused on the positions of deconstruction in the matter with subjectivity and individualism of students' construction in modern times. This research puts forward a supportive finding that the processes of analysis and evaluation, as well as creativity, do not merely depend on students' authentication and subjectivity but are also affected by students' contiguity with others. The students' contiguity was shown during their activities at the deconstruction stage. At that stage, the students showed the need to collaborate with

others to solve difficult problems. Moreover, at the articulation stage, the students personally learned to accept and take the ethical aspect from the argumentations and critiques of others. The students' activities reflecting the process of knowledge construction depends on the presence of others, who scaffold them in reaching the highest level of learning. Moreover, the mixture of personal and collective action at the learning stages contribute to the development of HOTS by producing an awareness of others. The authors argue that the HOTS is composed by the aspect of students' subjectivity and the awareness of the presence of others. Thus, the learning model plays a role in decentering the notion of authentication and subjectivity in the learning process as well as reinforcing the understanding of others' influence on students' subjectivity.

Based on the above discussion, the authors agree that the learning model should be intensively developed in future research by considering other learning components, such as curriculum (Casagrand & Semsar, 2017), learning theory and practices (Ganapathy, Singh, Kaur, & Kit, 2014), and technologizing university (Hopson, Simms, & Knezek, 2001; Bolton, 2006). Thus, following Drake and Brown's (2003) holistic approach, the development of HOTS could be systematically implemented in all the aspect of the higher education learning system.

Conclusion and Recommendations

The result of the research reflects the importance of the learning model in the development of the HOTS. Our research proves that the deconstructive learning model is effective in promoting students' HOTS. The learning model could solve two problems in the development of the HOTS: time orientation and students' passive attitude. Thus, the development of the learning model should be intensively developed in future research. However, this notion should be followed by other elements in the university, such as curriculum and policy as well as lecturer training and student learning support programs, thus, students' HOTS could be more systematically promoted.

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