The Factors Influencing High Order Thinking Skills Among Social Science Student

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ABSTRACT

The study is conducted to understand the influence of peer group and classroom management to HOTS (High Order Thinking Skills), with mediating factor of motivation. The proposition of the study is peer group and classroom management are influencing directly and indirectly through motivation to HOTS. The data of the study was collected from social science student XII class of one private school located in Jakarta. The data was processed by using SmartPLS program. The study findings are HOTS is strongly influenced by motivation, and motivation is influenced by peer group.

Keywords : HOTS, Peer Group, Classroom Management, Motivation

I. INTRODUCTION

Education is facing significant challenges in the form of changing context and future. There are six drivers of change: extreme longevity, rise of smart machine and systems, computational world, new media ecology, super-structured organizations, and globally connected world. The trends lead to different set of skills need to be mastered by students, these are sense making, social intelligence, novel & adaptive thinking, cross cultural competency, computational thinking, new media literacy, trans-disciplinarity, design mindset, cognitive load management, and virtual collaboration (Institute for the Future, 2011). Other study in the similar subject and propose three groups of skills for the future. The first skill is cognitive & meta-cognitive skills covering critical thinking and critical thinking. The second skill is social & emotional skills including empathy, self-efficacy, responsibility, and collaboration. The last skill is practical & physical skills composing ability using new information and communication tech devices (OECD, 2018).

The skills for the future are closely related with high order thinking skills (Shukla & Dungsungnoen, 2016). While there are many studies on high order thinking skills (HOTS) and education, most study have two characteristics, which are focus on science students, and look for the influence classroom management techniques. This study elaborates the factors of peer group and classroom management with motivation as mediating to influencing HOTS. Social student is selected since still very few studies on HOTS relate with them.

II. REVIEW OF LITERATURE

2.1 High Order Thinking Skills

The concept of HOTS in the study are following on the Bloom's Taxonomy revised that comprising of analyzing, evaluating, and creating skills (Anderson

& Krathwohl, 2015; Shukla & Dungsungnoen, 2016). HOTS is also characterized as enabler for students to deal with problems or situations and find solutions (Barratt, 2014).

Yusmanto et al. (2017) describe the components of HOTS for students as following

Table 1. Components of HOTS

Components of HOTS	Activity Level	Operational Verbs
Analyzing	Can students produce various answer alternatives by distinguishing different concept?	Evaluate, compare, criticize, sequence, distinguish, and determine.
Evaluating	Can students defend on a certain choice by giving logical reasoning?	Evaluate, criticize, choose/ select, relate, and give opinion.
Creating	Can students answer, make or develop product, theory or new perspective based on the learning process undergone?	Assemble, design, plan, make, and formulate.

Source: Modified table (Yusmanto et al., 2017)

Developing HOTS will require coordinated and integrated activities known as HOT Lab. It needs to be conducted regular and frequent and composed of 11 stage activities. The activities are: 1) understand the challenges given: real world problems, 2) produce ideas: determine and evaluate ideas, 3) prepare practical activities: experimental question; (4) materials and equipment; (5) prediction; (6) question of the method, 7) carry out practical activities: exploration; (8) measurement; (9) analysis; (10) conclusion, and 11) communicate and evaluate the results of activities (Safitri et al, 2019)

2.2 Classroom Management

Classroom management is a term for various techniques used by teachers to create a positive environment that allows students to effectively focus on academics (Back et al, 2015). There are many teaching methods or techniques that can be chosen by the teacher to direct students' thinking abilities to a higher level. Teachers can use methods or techniques for solving problems, case methods, cooperative learning or other methods that are

relevant to the teaching needs needed (Chinedu and Kamin, 2015).

George et al, (2017) reported that students in secondary schools whose teachers give instructions do differ significantly in terms of academic performance from those whose teachers do not effective classroom management significantly influences students' academic performance. Back et al. (2016) adding note that the link between classroom management and academic performance is mediating by school climate.

2.3. Peer Group

The literature on peer group written by Kinderman (2009) describe peer group is largely of friends in which students have frequent contact, conduct common activities, and develop interpersonal connectedness in certain level creating strong socializing power. Students can belong to several peer groups at the same time with different level of connectedness. The influence of peer group to

student's motivation is dynamics influenced by various factors (Carrell et al., 2009).

In relation with adolescence, Ryan (2001) found that peer group is an important context of development during adolescence and affects young adolescence achievement, beliefs, and behavior. The effect of peer group to student performance is confirmed by Ding & Lehrer (2007) with two important notes. Firstly, there is a tendency that high ability students will benefit more in having higher achieving schoolmates and having less variation in peer quality. Secondly, peer group effect is likely sensitive to the school quality.

2.3. Motivation

Motivation in learning context can be defined as a manifestation of the personal relationship of the individual to learning (Hrbackova & Suchankova, 2016). In other words, motivation is the condition required for effective learning. When students are not motivated internally, they will find difficulties in developing interest in contributing attention and energy to developing their learning or further development.

The study of Bailey & Philips (2015) support the indication that student with high motivation or able to self-motivate will perform better in the study. The study is also confirmed by Yahaya et al. (2012) concluding student motivation has strong significance on academic achievement. The way of motivation impacting academic performance is by enhancing resiliency in facing difficulties and challenges during study (Di Fabio & Saklofske, 2018).

The alignment of motives and incentives is the best condition for student's learning. The motives can cover aspects such as the intention to learn so that they can complete an activity, the basic need for new experiences, a need to perfect particular skills, to trounce a particular challenge, to be competent, a

need to be successful, and also a need to interact with peers (Kariuki & Mbugus, 2018; Sieberer-Nagler, 2015).

III. METHOD

The study is designed to identify factors influencing HOTS for senior high school social students. Two independent variables are peer group and classroom management. Peer group is essential for young adolescences. Classroom management as many studies already showed have significant influence on student performance. Mediating variable is motivation and dependent variable is HOTS.

Based on the purpose of the study and identified variables, there are five hypotheses proposed in the study:

H1: Peer Group has positive and significant impact on Motivation

H2: Classroom management has positive and significant impact on Motivation

H3: Motivation has positive and significant impact on HOTS

H4: Classroom management has positive and significant impact on HOTS

H1: Peer Group has positive and significant impact on HOTS

The study used quantitative method and using structural equation modelling technique. The data was. collected by distributing questionnaire to all XII grade of social student in a private school in Jakarta. The questionnaire consisted closed questions with five response options, namely Strongly Disagree score 1, Disagree score 2, Less Agree score 3, Agree score 4, and Strongly Agree score 5.

Data analysis is conducted by using SmartPLS software. Ghozali (2014) explained partial least square is soft modelling analysis method. The research model is as follows.

IV. RESULTS

The PLS analysis result can be used to test study hypothesis when convergent validity, discriminant validity, and reliability testing meet the requirement.
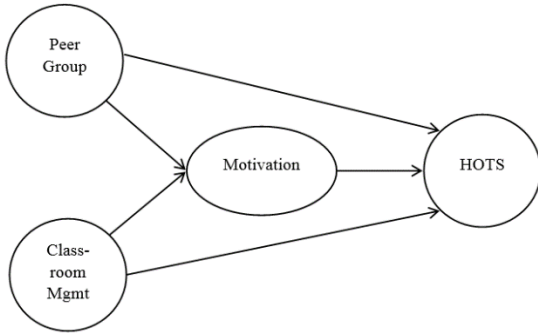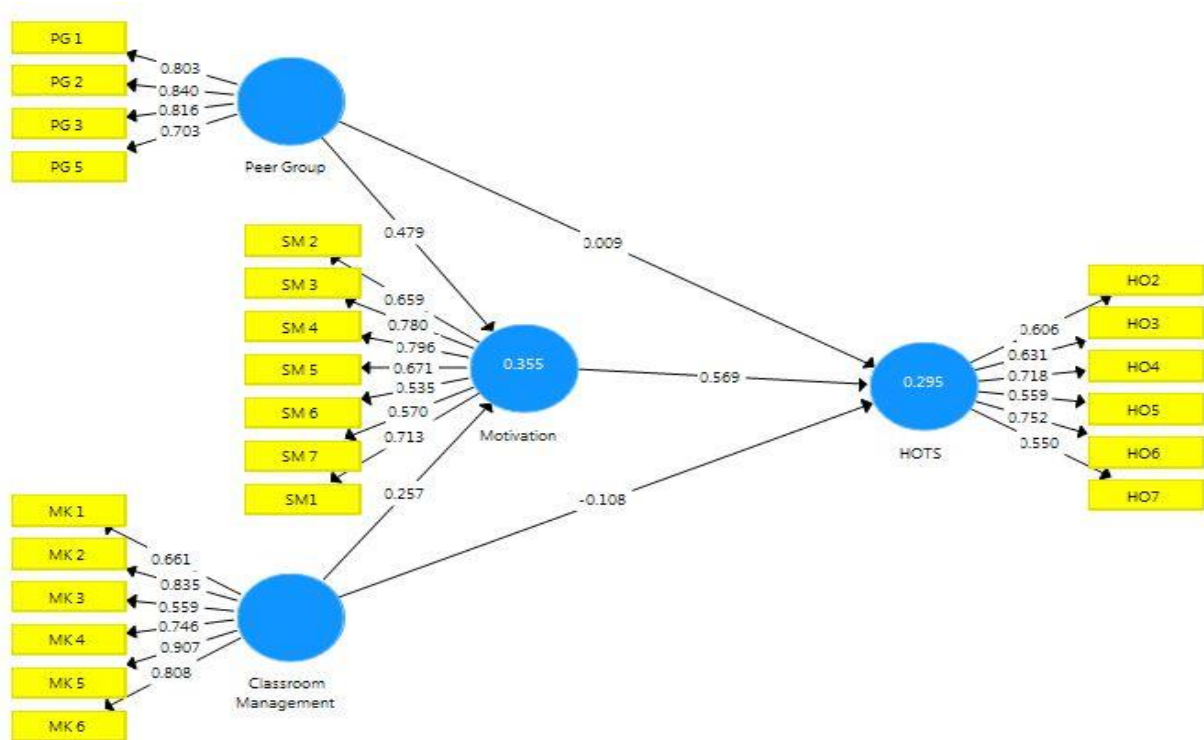

Figure 1. Research Model

Figure 2. Valid model estimation
Source: Processed primary data, 2019

Based on the estimation result in Figure 2, all indicators have loading factors above 0.5. Factor weight of 0.5 or more is considered strong enough to validate latent constructs (Hair et al, 2010; Ghozali, 2014). To measure the reliability of the result, the value of Cronbach Alpha, rho_A, and Composite Reliability will be used.

Table 2. Cronbach's Alpha, rho_A, Composite Reliability

Variables	Cronbach's Alpha	Rho_A	Composite Reliability
HOTS	0.716	0.731	0.804
Motivation	0.806	0.837	0.856
Peer Group	0.802	0.812	0.870
Classroom Management	0.854	0.928	0.890

Source: Processed primary data, 2019

The results of reliability test showed that all variables have value more than 0.7. Ghozali (2014) recommended reliability test have values more than 0.7 to meet reliability requirement. The results meet the requirement and considered as reliable.

The next test is for validity. The discriminant validity is used to ensure that each concept of each latent variable was different from the other. The Fornell-Larcker criteria requires for model to be considered has good discriminat validity when the value of each exogenous construct (diagonal) exceeds the correlation of the construct and the other construct (below the diagonal). The result of the testing as following.

Table 3. Discriminat Validity

	Classroom Mgmt	HOTS	Motivation	Peer Group
Classroom Mgmt	0.761			
HOTS	0.107	0.640		
Motivation	0.373	0.534	0.681	
Peer Group	0.242	0.291	0.541	0.792

Source: Processed primary data, 2019

The result showed the criteria of Fornell-Larcker as suggested by Ghozali (2014) is met and the model is valid.

In PLS, hypothesis testing is also named inner model testing. The test include measuring R Square, F Square, and by bootstrapping technique also measure P Values. Measuring the value of R Square is required to indicate the influence exogenous on endogenous variables. The test produced the value of R Square and R Square Adjusted in Table 3.

Table 4. Value of R Square

	R Square	R Square Adjusted
HOTS	0.295	0.253
Motivation	0.355	0.329

Source: Processed primary data, 2019

The result of the test indicated that HOTS can be explained by the variables of the study 29,5%, while 70,5% contributed by other variables. Motivation is influenced by peer group and classroom management for 35,5% and 64,5% from other variables.

Inner model testing also calculate the F Square and produce following results

Table 5. F Square

	HOTS	Motivation
HOTS		
Motivation	0.297	
Peer Group	0.000	0.334
Classroom Mgmt	0.014	0.096

Source: Processed primary data, 2019

The test indicates the influence of motivation to HOTS (0,297) and peer group to motivation (0,334) is enough, classroom management to motivation (0,096) is weak

Table 6. Hypothesis Testing (P-Values)

Relationship	Sample Mean	Standard Deviation	T Statistic	P-Values	Decision
Peer Group -> Motivation	0.472	0.111	4.296	0.000	Supported
Classroom Mgmt -> Motivation	0.263	0.151	1.697	0.090	Not Supported
Motivation -> HOTS	0.590	0.192	2.961	0.003	Supported
Classroom Mgmt -> HOTS	-0.096	0.231	0.467	0.641	Not Supported
Peer Group -> HOTS	0.009	0.232	0.039	0.969	Not Supported

Source: Processed primary data, 2019

The result of hypothesis testing showed only two hypotheses supported which are peer group to motivation and motivation to HOTS relations. The other three hypoheses are not supported.

V. DISCUSSION AND CONCLUSION

The study found that the effect of peer group to HOTS is weak. The result is not in line with the finding of Ding & Lehrer (2007) stating that peer has significant contribution to student performance. There are three notes to the differences. Firstly, as Kindermann (2009) already indicated that student can belong to several peer group at the same time and the effect of peer group to the student is dynamic. Secondly, the fitness of student to their peer group. Ding and Lehrer (2007) found high ability student benefit more in higher achieving peers. Thirdly, the effect of peer group to the HOTS is mediated by another variable.

The third note is verified with the supported hypothesis that the effect of peer group to motivation and motivation to HOTS is significant. In line with it, the study of Ryan (2001) found that peer group provides an important context for development of young adolescent especially in achievement, belief, and behavior. To conclude, the influence of peer group to HOTS is not direct but mediating through motivation. Using other stand point, not all peer groups can influence student's HOTS, only peer group that able to motivate students can support student in developing HOTS.

The study identified that classroom management has insignificance negative influence to HOTS directly. The finding different with many studies (Ahmad et al, 2017; Jamian et al, 2018). The difference of the studies indicate the effectiveness of teacher in managing the classroom is influenced by other variables that need to be studied. However, the classroom management have more positive influence on motivation. It is other role of classroom management that already identified by Kariuki & Mbugua (2018) stating positive teacher-student relationship boosted academic performance. In other words, the study found that classroom management can influence student's HOTS through facilitating motivation of the student.

The study indicate some interesting findings, namely, HOTS is significantly affected by motivation, peer group is linked to student's motivation, classroom management's influence to

HOTS is not supported. The findings clearly required for further study on more diverse and broad schools and students, elaborate the subjects with other variables such as family and cover different school years.

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Cite this Article

I Riza Primahendra, Ardian Sopa, Agus Purwanto, "The Factors Influencing High Order Thinking Skills Among Social Science Student", Shodhshauryam, International Scientific Refereed Research Journal (SHISRRJ), ISSN : 2581-6306, Volume 3 Issue 1, pp. 71-80, January-February 2020.
URL : http://shisrrj.com/SHISRRJ203115