

THE EFFECT OF LEARNING STRATEGY AND WAY OF THINKING TO LEARNING OUTCOMES OF SOCIAL SCIENCE

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ABSTRACT

The new paradigm of learning provides the opportunities to students involve actively in the learning process and appropriate learning strategies can increase and facilitate student learning activities in order to build concepts and reflect on learning activities. Oriented generative learning strategy orients in helping students to be able to understand and analyze new knowledge and incorporate new ideas with their prior knowledge, so that inside the students themselves will awaken new mental structures.

This study uses a non-equivalent design control group by applying 2x2 factorial design in the design of experiments. The subjects of the study are students of class VII academic year 2012/2013 in junior high school in Tulungagung Indonesian.

The result of this study indicates that: (1) there are differences understanding in learning outcomes of (social studies) IPS concept between students who study by using generative learning strategies and expository learning strategies, (2) there are differences in learning gains between students' understanding of (social studies) IPS concept of the cognitive style divergent and convergent thinking, (3) there is an interaction effect between learning strategy of cognitive styles toward the gain of learning understanding of (social studies) IPS concept, (4) there is a difference learning outcomes in applying (social studies) IPS concept between students who are learning by using generative learning strategies and expository learning strategies, (5) there are differences in the acquisition of learning in applying (social studies) IPS concept between students who learn by using divergent and convergent cognitive style, (6) there is an interaction effect between learning strategy cognitive style toward the acquisition of learning in applying (social studies) IPS concept.

Keywords: Learning strategy, Cognitive Style, Understanding, Applying the Concept

INTRODUCTION

Knowledge age impact on mega competition demands superior human resources prepared, smart, creative, adaptive and have global competitiveness. According to Marzano, et al., (1993), competencies need to be owned by a superior human being in order to compete in his life should have the ability to include: (1) creative thinking; (2) decision making; (3) problem solving; (4) learn how to learn; (5) collaboration and self-management. Based on this, the school as a developer of human resources lifelong learning need to reform and develop the habit of mind in order to prepare graduates who have the competence and high competitiveness.

Theoretical foundation as an alternative foothold in packaging of learning for understanding as well as in the development of the ability to apply the concept as social science problem solving is the key to learning. Some theoretical conception which underlying these conclusions are as follows. (1) The concept of learning refers to a constructivist view, that understanding of construction is becoming more important than memorizing fact (Brooks and Brooks, 1993; Jonassen, 1993); (2) Rote learning leads to inert knowledge-we know

something but never apply it to real life "(Heinich, et al., 2002); (3) Understanding is knowledge in thoughtful action (Perkin and Unger, 1999); (4) Understanding is a mental process of the adaptation and transformation of science (Gardner, 1999); (5) The understanding is the foundation for students to build insight and wisdom (Longworth, 1999); (6) Understanding is an indicator of performance prepared contemplated, critiqued and used by others (Gardner, 1999). The conclusion in the learning process becomes very important aspect of understanding as a representation of the learning outcomes that have implications for the ability to apply concepts in students.

Expectations is what drives the need for a foundation of theoretical, conceptual, and operational in the formulation of learning goals and development designs learning strategies of social science that more focused attention on the activation of prior knowledge of students, ways of overcoming the difficulties of student learning, and learning to understanding and its application.

Planning learning is done to obtain appropriate learning strategies in order to obtain optimal learning results in accordance with the purpose of learning. Implementation of learning is the implementation of learning design and should be measured or evaluated its success. Learning success include understanding the characteristics determined by the contents of the subject matter, the characteristics of the students, and the learning process. Bloom (1979) suggested a link between the characteristics of students, the quality of teaching and learning outcomes. Appropriate learning strategy is expected to improve the quality of teaching and students can learn by effectively and efficiently.

Generative learning is based on constructivist view that philosophical and pedagogical insights into how students construct concepts, searching for deeper meaning, digging new understanding and apply for problem resolution. Constructivist view of learning in generative learning strategy focuses on (1) the integration of new knowledge actively using the knowledge that has been owned by the students before; (2) students are active in constructing knowledge (3) gives the freedom to the students to uncover ideas or ideas and the reasons given to the problems (Wittrock, 1985).

Learning outcomes observed in this study is the ability of students to understand and apply the concept of social science. Bloom (1979) states that a person is said to have an understanding, when faced with something that must be communicated so he is expected to know what should be communicated and can use the ideas contained therein. While Wingkel (1996) understanding is the ability to grasp the meaning and significance of the material at present. While understanding the acquisition of learning application is the ability to apply a concept, principles, and methods on a problem that concrete and new.

Some research on generative learning by experts deemed able to improve the cognitive abilities of a person to the highest level (Craik and Lockhart, 1972), resulting in a more meaningful learning, a process of elaboration of learning outcomes. (Eysenck and Keane, 1990), the learning outcomes that are superior (Gardner, 1983). Jonassen (1993) says that the generative learning theoretically and empirically rooted in constructivist learning theories. Grabowski (1995) and Wittrock (1985) argues that the constructivist-based generative learning can improve learning effectiveness.

Based on the background above, researchers are encouraged to conduct research on the influence of learning strategies and thinking style on the ability to understand and apply the concept of social science. Learning strategy is expected to improve the quality of learning by actively engage students and improve learning outcomes. Steps has been taken is to integrate

learning strategies variables (generative and expository) in the style of thinking (divergent and convergent) for studying social science.

LITERATURE REVIEW

Generative Learning Strategy

In philosophical and pedagogical, generative learning is active learning activities, where students construct their own knowledge. Students seek their own sense of what they learn. This is the process of adjusting concepts and new ideas with the framework that already exists in their minds. This is consistent with the constructivist learning paradigm that emphasizes: (1) knowledge built by students actively; (2) the emphasis in teaching and learning lies in students; (3) teaching is to help students learn; (4) the emphasis in teaching and learning more on the process rather than the final result; and (5) the teacher is a facilitator (Jonassen, 1993) is the foundation of generative learning.

Empirical grounding generative learning strategy according to Osborn and Wittrock (1985) consists of five stages (syntax), namely: (1) the orientation stage; (2) the stage of expressing the ideas; (3) the stage of challenge and restructuring; (4) the stage of implementation; and (5) look back.

Expository Learning Strategies

Expository learning strategies including conventional learning strategies are implemented on a regular basis in daily lessons. Regularly applied learning is defined as learning that begins with a lecture, followed by delivering course material, discussion, exercises, assignments, and ends with an evaluation.

Based on the definition or the characteristics of expository teaching strategy mentioned above, it can be said that learning with expository teaching strategy is a practice that is mechanistic and reduced to the provision of information. Tishman (1993), with other languages the model called "transmission of knowledge". The teacher's role is to prepare and transmit knowledge or information to students, while the role of the student is receiving, storing, and perform other activities in accordance with the information provided.

Linear learning principles are: (1) identifying and formulating learning goals; (2) the subject matter based on textbooks that have been determined; (3) the expected learning outcomes must be measured and adjusted to the standard validity and reliability; (4) The change-oriented design student behavior.

Divergent and Convergent Thinking style

Differences in style divergent thinking and convergent in solving a problem as expressly stated by Seifert (1983), that a variety of situations and problems encourage students to solve such problems by using the style of convergent thinking, otherwise the situation and problems of others, encourages students to solve problems with divergent thinking styles.

The term divergent and convergent thinking first was proposed by Torrance (1979). Convergent thinking oriented one good answer or right as required by the exam questions in general. Meanwhile, divergent thinking is a process-oriented thinking on the discovery of alternative answers or more answers.

Social Science Education Characteristics

Social Science Education as educational disciplines with the identity of the field of study eclectic called "an integrated system of knowledge", "synthetic discipline",

"multidimensional", and "conceptual studies systemic" is a study (new) different from the study of mono-disciplinary or "traditional" discipline science (Phillip, 1990).

Social Science as a branch of "synthetic and multidimensional" integrated from various branches of the social sciences such as sociology, history, geography, economics, politics, law, and culture were formulated on the basis of reality and social phenomena with an interdisciplinary approach of aspects and branches of the social sciences (sociology, history, geography, economics, politics, law, and culture) (Welton and Mallan, 1988).

Interaction between Learning Strategies, Style thinking and Learning Outcomes

Learning strategy in synergy with the style of thinking indicates the interactive effects between learning strategies and thinking styles to improve learning outcomes to understand the concept and apply the concept of social science. Provisional estimates appear no interactive effect between learning strategy and style of thinking to understand the concepts and results of applying the concept of social science.

Based on the characteristics of generative learning to construct, and transfer knowledge into his complex and meaningful. Style characteristics thought to have a role in looking at the tendency of students to respond to such information. Thus, there is an interaction between learning strategy and style of thought on learning outcomes of students in understanding and applying the concept of social science.

OBJECTIVES

The purpose of this study was to examine the influence of generative learning strategies and the expository learning strategies as well as style of divergent and convergent thinking towards learning outcomes understanding and applying the concept of social science in 7th grade of Junior High School (SMP) to determine the existence of:

1. The difference in the learning outcomes and application of the concept of understanding between groups of students who were treated using generative learning strategies and expository in social studies in 7th grade of Junior High School (SMP).
2. The difference to the learning outcomes and application of the concept of understanding between groups of students who have divergent and convergent thinking styles in social studies in 7th grade of Junior High School (SMP).
3. The effect of significant interaction between learning strategy and thinking styles of students' learning outcomes understanding and application of concepts in social studies in 7th grade of Junior High School (SMP).

METHODOLOGY

This research uses experimental design apparent in the measurement of two factors, namely learning strategies (generative and expository) and style of thinking (divergent and convergent) to the learning outcomes concept understanding and implementing the concept in the design version 2 x 2 factorial pretest-posttest nonequivalent control group (Kerlinger , 1986; Tuckman, 1999; Wiersma, 1991). The study population was the seventh grade students of Junior High School (SMP Negeri 1 and 2) Sumbergempol in Tulungagung. Sampling was done by cluster random sampling technique is sampling 6 random class of 20 existing classes in seventh grade at Junior High School (SMP Negeri 1 and 2) Sumbergempol (Ardhana, 1987; Campbell and Stanley, 1966). Based on the sample determination techniques, elected

two groups. One class as the experimental group using generative learning strategies treatment the other as the control group using expository learning strategies treatment.

RESEARCH DESIGN

The study design or the design of this study is an investigation plan and structure are arranged in such a way, so that it will be able to obtain answers to questions that have been put forward in the study (Kerlinger, 1986). Factorial design two factors provide an opportunity to investigate the effects of simultaneous treatment of two variables called factors of the sample group were investigated (Ferguson, 1981; Wiersma, 1995). Nonequivalent pretest-posttest control group design aims to investigate the degree of similarity between the group and the scores of pre-test learning outcomes of social science serves as covariates to statistical control (Campbell and Stanley, 1966; Kerlinger, 1986; Wiersma, 1995). Design of experiments use a 2 x 2 factorial design as a form of treatment.

Based on a quasi-experimental design pretest-posttest nonequivalent control group, the 2 x 2 factorial experiment follows the pattern in Table 3.1.

Table 1. The design of 2 x 2 factorial experiments

		<i>Learning Strategy</i>			
		<i>Generative</i>		<i>Expository</i>	
<i>Thinking Style</i>		<i>Understanding Concept</i>	<i>Applying Concept</i>	<i>Understanding Concept</i>	<i>Applying Concept</i>
		(1)	(2)	(1)	(2)
Divergent	(1)	$Y_{1,1,1}$	$Y_{1,2,1}$	$Y_{1,3,1}$	$Y_{1,4,1}$
		$Y_{1,1,2,\dots}$	$Y_{1,2,2,\dots}$	$Y_{1,3,2,\dots}$	$Y_{1,4,2,\dots}$
		$Y_{1,1,n}$	$Y_{1,2,n}$	$Y_{1,3,n}$	$Y_{1,4,n}$
Convergent	(2)	$Y_{2,1,1}$	$Y_{2,2,1}$	$Y_{2,3,1}$	$Y_{2,4,1}$
		$Y_{2,1,2,\dots}$	$Y_{2,2,2,\dots}$	$Y_{2,3,2,\dots}$	$Y_{2,4,2,\dots}$
		$Y_{2,1,n}$	$Y_{2,2,n}$	$Y_{2,3,n}$	$Y_{2,4,n}$

Legend: y = Learning Outcomes of Social Science, n = Research Subject to-n

This table shows the variables that can be explained as follows. The first variable is a learning strategy that has dimensions of generative learning strategies and learning strategies expository. The second variable is thinking style, has two dimensions, namely style of divergent and convergent thinking style. The **main influence** and **interaction effects** of treatment variables can thus be expressed clearly and easily.

Research Subject

The subjects were students of Junior High School (SMP Negeri 1 and 2) Sumbergempol Tulungagung semester II academic year 2012/2013.

Table 2. Research subject

<i>School</i>	<i>Sample</i>	<i>Number</i>	<i>Learning Strategy</i>
SMP Negeri 2	7 th grade Class A	34	Generative (99 siswa)
	7 th grade Class F	32	
SMP Negeri 1	7 th grade Class H	33	Expository (95 students)
SMP Negeri 1	7 th grade Class B	32	
SMP Negeri 2	7 th grade Class C	33	
	7 th grade Class G	30	
Total	6 classes	194 students	2 groups

The initial sample was selected students is 194 students. Sorting and tabulating the results and showed that learners who had complete data for all variables that 194 students.

Multivariate test

Hypothesis testing is done by analysis Multivariate Analysis of Variance (MANOVA) 2 x 2 factorial, include examining activities multivariate test (multivariate testing), testing the effects of inter-subject (test of between-subjects effects) and the estimated grand mean using the computer program SPSS 18.0 for Windows.

Table 3. Multivariate Test Effect between subject To Examine Independent Variables Against dependent Variable

source variation	Dependent Variabel	Quadratic number	df	quadratic Average	F	Sig.	Partial Eta Squared
Corrected Model	Understanding concept	4347.843 ^a	3	1449.281	14.957	.000	.191
	Applying concept	11938.259 ^b	3	3979.420	30.340	.000	.324
Intercept	Understanding concept	1111204.075	1	1111204.075	1.147E4	.000	.984
	Applying concept	692145.873	1	692145.873	5.277E3	.000	.965
Learning Strategy	Understanding concept	2421.162	1	2421.162	24.987	.000	.116
	Applying concept	7074.133	1	7074.133	53.934	.000	.221
Thinking style	Understanding concept	1225.768	1	1225.768	12.650	.000	.062
	Applying concept	2470.710	1	2470.710	18.837	.000	.090
Learning Strategy	Understanding concept	412.057	1	412.057	4.253	.041	.022
* Thinking style	Learning Outcome Applying concept	1476.985	1	1476.985	11.261	.001	.056
Error	Understanding concept	18410.142	190	96.895			
	Applying concept	24920.963	190	131.163			
Total	Understanding concept	1159625.000	194				
	Applying concept	750825.000	194				
Corrected Total	Understanding concept	22757.985	193				
	Applying concept	36859.222	193				

RESULTS

Based on the results of hypothesis testing, the results of this study can be summarized as follows:

1. There is a significant difference between the groups of students were given treatment using generative and expository learning strategies in understanding concepts in social studies with F value of 24.987 and probability of $0.00 < 0.05$.
2. There are significant differences between the groups of students who have divergent and convergent thinking styles in understanding the concepts in social science with F value of 12.650 and probability of $0.00 < 0.05$.
3. There is a significant interaction effect between generative and expository learning strategies and thinking styles of students in understanding the concepts in social science with F value of 4.253 and a probability of $0.041 < 0.05$.
4. There are significant differences between the groups of students were given treatment using generative and expository learning strategies in applying the concept in social science with F value of 53.934 and probability of $0.00 < 0.05$.
5. There are significant differences between the groups of students who have divergent and convergent thinking styles in applying the concept of social science with F value of 18.837 and probability of $0.00 < 0.05$.
6. There was a significant interaction effect between learning strategies and thinking styles of students in applying the concept of social science with F value of 11.261 and probability $0.001 < 0.05$

DISCUSSION

In detail in this discussion, there are six main points discussed, namely: (1) the influence of generative learning strategy and expository on learning outcomes towards understanding of the concept of social science; (2) the effect of divergent and convergent thinking styles on learning outcomes towards understanding of the concept of social science; (3) the interaction between learning strategy and style of thought on learning outcomes towards understanding of the concept of social science; (4) the effect of generative learning strategy and expository on learning outcomes of applying the concept of IPS; (5) the effect of divergent and convergent thinking styles to apply the concept of social studies learning outcomes; (6) the interaction between learning strategy and style of thought on learning outcomes of applying the concept of Social Science.

Effect of Generative and Expository Learning Strategies in Understanding the Concept of Social Science

The first hypothesis testing results prove that there are differences in the acquisition of learning outcomes between students' understanding of the concept of social science learning with generative learning strategy and learning strategies expository. Based on the estimated marginal means with the output value of $F = 24.987$ and probability value of $0.00 < 0.05$ (5% significance level) showed that the average of 80.19 generative learning strategies and expository learning strategies average of 72.75. Indicate statistically significantly different.

Another theoretical reasons that expository learning strategy does not exert significant influence on learning outcomes is not the emergence of positive interdependence in learning, students with high academic achievement has not contributed to students with low academic achievement. Further Johnson and Johnson (1994) divides interdependence into: (1) positive;

(2) negative, and (3) there is no mutual dependency among students. Researchers predict that no interdependence among students is quite dominant in learning so that learning outcomes are not increased optimally. On the other hand according to Woolfolk and Nicolich (1984) expository teaching strategy is: "*Appropriate for teaching relationship Among the concepts but not for teaching the concept Themselves*". Expository strategy appropriate to teach the relationships between concepts is not to teach the concept itself.

Studies related to generative learning strategy often found in the journals of education. Several studies, among others by Doctorow, et al., (1978) conducted a study of primary school children in understanding the meaning of sentences in each paragraph of text. Research results show the students progressing increase in organizing information more regularly to be kept in the student's cognitive. Carnine and Kinder (1985) in their study examined the effects of combination for generative strategies on understanding through improved feedback. His findings were the students better understand the narrative text in significantly after the post-test compared understand narrative text through expository method. This view is supported by studies Linden and Wittrock (1981) also tested the effect of an image, sentence summary, and analogy, everything is increased and correlated with understanding.

Smith and Kame'enui (1998) in his research stated that the generative learning strategies can improve absorption (both categories) and mastery learning (complete category) and increasing the activity of the students (good categories).

Effect of Divergent and Convergent Thinking Styles in Understanding the Concept of Social Science

Based on the results of testing the effect of divergent and convergent thinking styles in understanding the concept of social science in the table 4:15 that the test results indicate H_0 2 F value of 12.650 and probability amount $0,00 < 0,05$ so that H_0 rejected. These test results show that H_0 2 rejected, which means that there are differences in learning gains IPS concept understanding among students who studied with divergent and convergent thinking style.

In accordance with previous studies in which a person's thinking style in a variety of formats and forms a significant influence on learning outcomes. This statement is based on the theory Eggen and Kauchak (2008) which states that the effectiveness of the learning happens when students are actively involved in organizing and discovery of information (knowledge). Students not only receive the information provided by the teacher, but with all its potential will become active learners.

According to Good and Brophy (1990) active students in the learning process is strongly influenced by the students' ability to apply cognitive skills that include attitudes and attempt to answer the question, explores memory, processing information, and assess the potential for problem solving. Carlson and Buskist (1997) explains that the thought process of reviewing the structure and introduction of the concept of deductive reasoning, inductive reasoning and problem solving.

Thus, theoretically students divergent thinking style tends to have the acquisition of learning outcomes are higher than the individual style of convergent thinking. It is supported by empirical findings shown in the results of research on convergent and divergent thinking styles.

The Effects of Significant Interaction between Generative and Expository Learning Strategies and Thinking Styles of Students in Understanding the Concept of Social Science

Based on the results of testing the interaction of two main influences learning strategies and style of thinking for the dependent variable learning gain understanding of the concept of social science in the table 4:15. Tests that produce F of 4.253 and a probability of 0.041 <0,05 so H_0 rejected. These test results indicate that there is an interaction between learning strategies and cognitive style on learning acquisition understanding of the concept of social science.

Research findings reveal the significance level or the probability value interaction learning strategies and thinking style (THINKING STYLE STRATEGIES *) is 0.041 <0.05, so that the null hypothesis is rejected or nil. This test shows that there is an interaction effect between learning strategies and thinking styles of students towards learning outcomes of understanding the concept of social science.

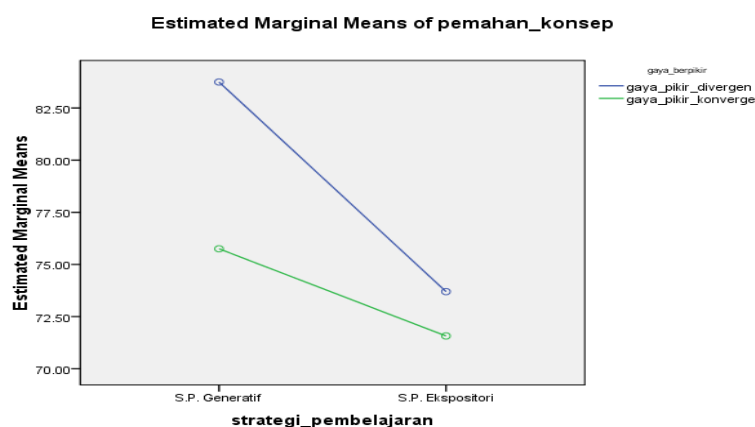


Figure 1. Graph of influence the interaction between learning strategy and style of thinking towards learning outcomes of understanding the concept.

Support theoretically and empirically against the main influence learning strategies and the major influence of the style of thinking towards the acquisition of learning outcomes understanding the concept of social science has the strong impact on the interaction of learning strategies and style of thinking towards the acquisition of IPS understanding of the concept of learning outcomes. In accordance with the findings of this dissertation research that states there is an interaction between the strong interaction learning strategies and style of thinking towards the acquisition of learning outcomes IPS concept understanding, then learning strategy depends on how the thinking styles of students in learning acquisition understanding of the concept of social science.

The Effect of Generative and Expository Learning Strategies in Applying the Concept of Social Science

The test results showed that the PH value of 53.934 and probability value of 0.00 <0.05 so H_0 4 rejected. The test result means that there are differences in learning gains application of social science concept between students learning with generative and expository learning strategies.

Theoretical foundation which supports the findings of the above study is that the ability of students to understand the material has a strategic position in the ladder of learning (learning ladder) (Ardhana, et al., 2003). If the student does not achieve the ability to "understanding",

the students will have difficulty in achieving the skills above such as the implementation, synthesis, analysis and evaluation. According to Johnson (2002) students need to be trained in the skills of critical thinking, creative, and logical-scientific, since this capability is indispensable in solving the problem (Marzano et al., 1993; Krulik and Rudnick, 1999).

The Effect of Divergent and Convergent Thinking Styles in Applying the Concept of Social Science

Based on test results null hypothesis fifth tested in this study is to show the F value of 18 837 and the probability amount $0,00 < 0,05$ so that H_0 is rejected. The test results showed that H_0 is rejected, which means that there are differences in the acquisition of learning to apply the concept of social science between students learning style with divergent and convergent thinking.

There are several studies that use divergent thinking as a moderator variable in the study who had a good opportunity to understand and apply the concept of knowledge, such as brainstorming (brainstorming) by Artherton (2005), giving the question open (open ended question) by Collette and Chiappetta (1994), accompanied by the provision of sufficient time for students the opportunity to think by Croom and Stair (2005), a technique to write freely and mind mapping by Carnine and Kinder (1985), model of research projects and the model compilation portfolio (Gronlund, 1998), model of service learning Baker, et al., (1994), role playing by Dickson (1994), and problem solving by DiMino et al., (1990).

The Significant Interaction Effect between Learning Strategies and Thinking Styles of Students in Applying the Concept of Social Science

Based on the results of testing the interaction of two main influences learning strategies and style of thinking produce F at 11.261 and probability of $0.001 < 0,05$ so that H_0 is rejected. These test results indicate that there is an interaction between learning strategies and cognitive style on the acquisition of learning to apply the concept of social science.

Ordinal pattern of interaction between learning strategies and thinking style is described as follows:

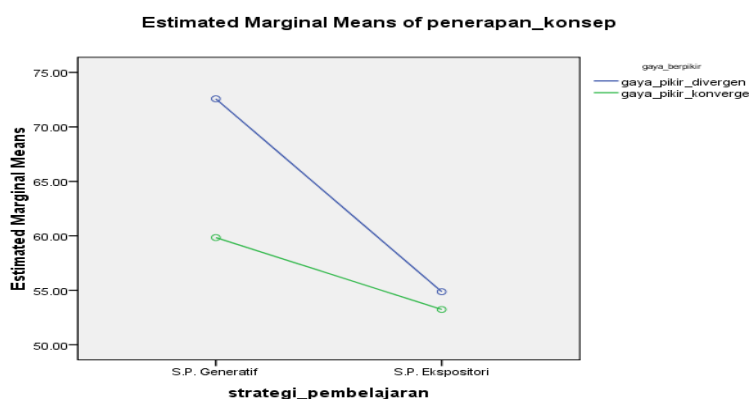


Figure 2. Graph influence the interaction between learning strategy and style of thinking towards the acquisition of applying the concept of learning outcomes.

According to Mac and Dettmer (2006), generative learning is characterized by the aspirations of students in various cognitive aspects include: (a) the process of synthesizing of various components to produce one combined have meaning, (b) imagination in the sense of creating and exploring mental picture of the situation showed not physically, and (c) be creative in the sense of creating new things that are different from existing ones.

In this concluding part mentioned two main points, namely the conclusions and suggestions.

CONCLUSION

Based on hypothesis testing and discussion, some conclusions can be delivered the following results:

1. The Results of studying understanding and applying the concept of social science between students learning with generative learning strategy and learning strategies expository indicate a difference. The use of generative learning strategy gives effect to the understanding of the concept of social science learning outcomes are higher than the use of expository teaching strategy.
2. The results of studying understanding and applying the concept of social science between students with divergent thinking and convergent style showed a difference. Students who have divergent thinking style higher learning outcomes than students with an understanding of the concept of convergent thinking style.
3. The difference learning strategies and thinking style shows the influence of interaction on learning outcomes understanding and implementing the concept. The consequence of the interaction is logical for the main treatment effects. Divergent and convergent thinking styles to change the relationship of learning strategies on learning outcomes understanding the concept of social science.

SUGGESTIONS

The suggestions were submitted, namely:

1. Teachers are encouraged to use generative learning strategies to improve learning outcomes understanding and applying the concept of social science.
2. Generative learning strategy requires activity and independence of students to learn the appropriate lesson plan that has been set.
3. Before applying the generative learning, facilities, infrastructure and learning resources that support the implementation of generative learning strategy should already be well prepared.
4. Planning, organizing, delivering, managing and evaluating of learning, should consider students thinking style as a moderator variable that is predicted to affect learning outcomes.

REFERENCES

- [1]. Perkin, D.N., & Unger, C. (1999). *Teaching and learning for understanding*. Prentice Hall, New Jersey.
- [2]. Torrance, E.P. (1979). *Torrance Test of Creative Thinking: Norms and Technical Manual*. Bensenville, IL: Scholastic Testing Service.
- [3]. Ardhana, W., Kaluge, L., & Purwanto. (2003). Pembelajaran inovatif untuk pemahaman dalam belajar matematika dan sains di SD, SMP, & di SMU. *Laporan penelitian*. Penelitian Hibah Pasca Angkatan I tahun I. Direktorat Penelitian dan Pengabdian Pada Masyarakat. Ditjen Dikti. Depdiknas.
- [4]. *Innovative learning for understanding in learning mathematics and science in elementary, middle, and high school. Research report. Research Grants Post-Force*

- Directorate I. *The first year the Community Research and Service. Directorate General of Higher Education and Civil Service. Ditjen Dikti. Depdiknas.*
- [5]. Atherton, J. (2005). *Behaviour Modification*. (Online) http://www.learningandteaching.info/learning/behaviour_mod.htm Web page, diakses 7 Maret 2013
- [6]. Baker, S., Simmons, D., & Kame'enui, E. (1994). Making Information More Memorable For Students with Learning Disabilities. *Learning Disabilities Forum*. 19 (4): 14-18.
- [7]. Bloom, B.S. (1979). *Taxonomy of Educational Objectives (the Classification of Educational Goal) Handbook I Cognitive Domain*. London: Longman Group Ltd.
- [8]. Brooks, J.G. & Brooks, M.G. (1993). *In search of understanding: The case for constructivist classrooms*. Virginia: Association for Supervision and Curriculum Development.
- [9]. Campbell, J.T., & Stanley, J.C. (1966). *Experimental and Quasi Experimental Design for Research*. Chicago: Rand McNally.
- [10]. Carlson, N., & Buskist, W. (1997). *Psychology; The science of behaviour*. (5th Ed). Boston: Allyn and Bacon
- [11]. Carnine, D., & Kinder, D. (1985). Teaching Low-Performing Students To Apply Generative And Schema Strategies To Narrative And Expository Material. *Journal Remedial and Special Education*. 6 (2): 20-30.
- [12]. Carnine, D. W. & Kinder (2005). *Designing Effective Mathematics Instruction: A Direct Instruction Approach (4th Edition)*. Amazon.com: Pearson.
- [13]. Collette, A.T., & Chiappetta, E.L. (1994). *Science Instruction in the Middle and Secondary Schools* (3rd ed.). New York: Merrill.
- [14]. Craik, F.I.M., & Lockhart, R.S. (1972). What do student perceive as difficult in H.S.C. chemistry. *Australian Sciences Teacher Journal*. 32 (2): 45-51
- [15]. Croom, B., & Stair, K. (2005). Getting from to a effective questioning for effective learning. *The Agricultural Education Magazine*. 78 (2): 12-14
- [16]. Dickson, S. (1994). *An Examination of The Affects of an Integrated Reading and Writing Instructional Approach on The Ability of Middle School Students to Produce and Comprehend Compare/Contrast Prose*. Disertasi tidak diterbitkan. Eugene: University of Oregon
- [17]. Dimino, J., Gersten, R., Carnine, D., & Blake, G. (1990). Story Grammar: An Approach for Promoting At-Risk Secondary Students' Comprehension of Literature. *The Elementary School Journal*. 91(1): 19-32.
- [18]. Doctorow, E.L. (2001). *Bloom's Modern Critical Interpretations*. Chelsea: Duke University Press.
- [19]. Ferguson, G.A. (1981). *Statistical analysis in psychology and educatin (5th ed)*. New York: McGraw-Hill
- [20]. Gardner. (1983). *Frames Of Mind –The Theory Of Multiple Intellegences*. New York: Basic Books.
- [21]. Gardner, H. (1999). *The dicipline mind: What all students should understand?* New York: Simon and Schuster Inc.

- [22]. Good, T.L., & Brophy, J.E. (1990). *Educational Psychology: A Realistic Approach* (4th ed.). New York: Longman.
- [23]. Grabowski, B.L. (1995). Mathemagenic and generative learning: A comparison and implications for designers. Dalam Romiszowski, A. J. & Dills, C. (Eds.), *Instructional developments* (hlm. 111-121). Englewood Cliffs, NJ: Educational Technology.
- [24]. Gronlund, N. (1998). *Assessment of student achievement*. (6th Ed.). Boston, Allyn & Bacon.
- [25]. Heinich, R., Molenda, M., Russell, J.D., & Smaldino, S.E. (2002). *Instructional media and technology for learning, 7th edition*. New Jersey: Prentice Hall, Inc.
- [26]. Johnson, E.B. (2002). *Contextual Teaching and Learning*. California: Corwin Press, Inc.
- [27]. Johson, D.W., & Johnson, R.T. (1994). *Learning Together and, Alone Cooverperative, Competitipe, and Individualistic Learning* (4thed). Massachusetts: Allyn & Bacon Publisher.
- [28]. Jonassen, D.H. (1993). Objectivism versus constructivism: Do we need a new philosophical paradigm. *Journal of Educational Technology: Research and Development*, 39 (3), 15–26.
- [29]. Kenny, R. (1995). The generative effects of instructional organizers with computer-based interactive video. *Journal of Educational Computing Research*, 12(3), 275–296
- [30]. Kerlinger. F., N. (2000). *Foundation of Behavioral Researh*. Holt: Rinehart
- [31]. Krulik, S., & Rudnick, J.A. (1999). *The new sourcebook for teacing reasoning and problem solving in Junior and Senior High School*. Boston: Allyn and Bacon.
- [32]. Longworth, N. (1999). Making Lifelong Learning Work: Learning Cities for a Learning Century. London: Kogan, M (Ed.): *Theory into practice: Teaching for higher order thinking*. 32(3): 179-186.
- [33]. Macht, M., & Dettmer, D. (2006). Everyday Mood and Emotions After Eating a Chocolate Bar or an Apple. *Journal of Appetite*. 46 (3): 332-336.
- [34]. Marzano, R.J., Paynter, D. E., & Doty, J. K. (2003). *The pathfinder project: Exploring the power of one: Teacher's manual*. Conifer, CO: Pathfinder.
- [35]. Marzano, R.J., Pickering, D., & McTighe, J. (1993). *Assessing Student Outcome: Performance Assessment Using the Dimensions of Learning Model*. Alexandria,VA: Association for supervision in curriculum development.
- [36]. Osborne, R. J., & Wittrock, M.C. (1985). The Generative Learning Model and Its Implications for Science Learning. *Journal of Studies in Science Education*. 3 (12): 59-75
- [37]. Philip A.H. (1990). Integrating Science and Technology In To The Social Studies: Basic Elements. *Journal of Social Education*. 4 (5): 207-209
- [38]. Seifert, K. (1983). *Educational Psychology*. English: Publisher CENGAGE Learning
- [39]. Smith, S., Simmons, D.C., & Kame'enui, E.J. (1998). Phonological awareness: Research bases. Dalam Simmons, D.C. & Kame'enui, E. J. (Eds.), *What reading research tells us about children with diverse learning needs: Bases and basics* (hlm. 129-140). Mahwah, NJ: Erlbaum.

- [40]. Taricani, E. (2002). *Effect of the level of generativity in concept mapping with knowledge of correct response feed back on learning*. Desertasi tidak diterbitkan. Pennsylvania: Pennsylvania State University.
- [41]. Tishman, S. (1993). Teaching Thinking Dispositions: From Transmission Enculturation. *Journal Theory into Practice*, 32 (3): 147-153
- [42]. Tuckman, B.W. (1999). *Conducting Educational Research*. (5th ed). Orlando: Harcourt Bruce & Company Press
- [43]. Welton, D.A., & Mallan, J.T. (1988). *Children and Their World*. Boston: Houghton Mifflin Coy.
- [44]. Wiersma, W. (1995). *Research Method in education: An Introduction (6th ed.)*. Boston: Allyn & Bacon
- [45]. Wingkel, W.S. (1996). *Psikologi Pengajaran (edisi revisi) cetakan ke-5*. Jakarta: Gramedia Widiasarana Indonesia.
- [46]. Wittrock, M.C. (1985). Teaching Learners Generative Strategies For Enhancing Reading Comprehension. *Journal Theory and Pract.* 24 (2): 247-254
- [47]. Woolfolk, A.E., & Nicolich, L.M. (1984). *Educational Psychology for Teaching*. New Jersey: Prentice Hall.