UNIVERSITAS ISLAM INDONESIA

UNIVERSITAS GADJAH MADA

INTERNATIONAL INDONESIAN FORUM FOR ASIAN STUDIES

PROCEEDING

The 3rd International Indonesian Forum for Asian Studies

BORDERLESS COMMUNITIES & NATIONS WITH BORDERS

CHALLENGES OF GLOBALISATION

Universitas Gadjah Mada & Universitas Islam Indonesia
Yogyakarta

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The 3rd International Indonesian Forum for Asian Studies

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February 8-9th 2017 | Gedung Lengkung UII Yogyakarta

WELCOME ADDRESS

International Indonesian Forum for Asian Studies

The International Indonesian Forum for Asian Studies (IIFAS) is an organically grown academic network to enhance the study of the Asia-Pacific region. It was initiated by several doctoral students from Indonesia, Australia and several other countries with the aim to provide an opportunity for young academics in their start-up phase of their career and established academics to meet together in academic exchanges. Sharing research findings and opening discussion in an interchange of knowledge at renown academic venues was the desire for the founding members. Building on a series of successful conferences and public lectures of some of its initial members has made IIFAS grown considerably.

After receiving a keen invitation from two hosting partners, Universitas Gadjah Mada (UGM) and the Universitas Islam Indonesia (UII), IIFAS has come to Yogyakarta in 2017. The Forum is dedicated to friendly and open exchanges in a truly academic tradition, thus actively welcoming participants from Asia, the Pacific and the rest of the world. The call for papers was circulated in May 2016 and by request extended till the 15th of January 2017. IIFAS is aware of the difficulties some far away students might face to present a paper in person at the conference venue in Yogyakarta. As a result of those difficulties, some presenters have been permitted to prepare a poster or absentee presentation at the conference.

I wish to thank the generous UII and UGM rectors, deans, heads of departments, lecturers, staff and volunteer students for the outstanding facilities granted and services provided at this 3rd IIFAS Borderless Communities and Nations with Borders: Challenges of Globalisation Conference. I encourage all delegates and guests a constructive time in creative exploration of innovative interdisciplinary research ideas. I wish you an enjoyable time at the conference, a wonderful experience meeting the Yogyakarta residents and visiting the magnificent sites of interest that virtually stretch between the beach of Parangtritis and the top of Mount Merapi volcano.
Welcome and thank you for your endeavours meeting here together.

Johan Richard Weintré
Chairperson of the Forum

FOREWORD

Center for Southeast Asian Social Studies (CESASS), Universitas Gadjah Mada

We are pleased to welcome all the honourable speakers, guests, and participants to the heart of Java in Yogyakarta, Indonesia, a city of arts surrounded by traditional ambience as a source of Southeast Asian treasure.

Universitas Gadjah Mada, through its CESASS, promotes a social transformation in Southeast Asian epistemic community based on how Southeast Asian see themselves, and to be a hub for its studies network in global scale. CESASS was also pointed as a Center of Excellence (PUI) in social science by Ministry of Research and Higher Education of the Republic of Indonesia since 2016. By this mandate, the Center prioritizes to develop advanced research management and to promote inclusiveness in reconstruction of Southeast Asian studies.

In regard to those roles, the Center aims to bound an epistemic community of Southeast Asian studies for knowledge transfer and scholars networking. 3rd IIFAS Conference is one of the significant agendas from CESASS, as well as our partners; IIFAS and UII, to deliver that purpose. By gather all the scholars to discuss a discourse in the studies, it might be useful for our research development near future. I do hope that you will take this opportunity to explore the potential knowledge and broadening your network.

We are glad for meeting you in this Conference and wish you have fruitful forums. Hopefully, it can contribute to the development of Southeast Asia and Social Studies.

Hermin Indah Wahyuni
Director of the Center

FOREWORD

International Relations Department, Universitas Islam Indonesia

Welcome or selamat datang to the 3rd International Indonesia Forum for Asian Studies (IIFAS). This year the 3rd IIFAS Conference is held in Yogyakarta and co-hosted by the Department of International Relations of Universitas Islam Indonesia (UII) and the Center for Southeast Asian Social Studies of Universitas Gadjah Mada (PSSAT UGM). We are delighted to share with you the city of Yogyakarta, a well-known academic magnet for many students of the Indonesian Archipelago and international visitors alike who visit Indonesia every year. The city is a host to several hundred institutions of higher education and also truly one of the most important centers of Javanese culture. Therefore, Yogyakarta ought to be a perfect spot for this conference event and for us to meet at this occasion.

The two host universities of this year's conference have both their own uniqueness. It is not very well known but UII holds the title of the oldest national private university in Indonesia, while our partner in this conference, UGM, holds the title of the oldest state university here in Yogyakarta. UII has committed itself to provide study opportunities in the many fields of sciences and the religion of Islam for the benefit of the society. This IIFAS conference is one of UII efforts to fulfill its commitment in sciences and to provide a greater understanding of our particular religious' feelings. The conference has opened an opportunity for a greater interaction among academics and guests. As the conference theme indicates, we hope in these two days to explore and share ideas on how borderless communities interact in a field of nations with fixed borders. We hope that the conference will expose significant results for the development of knowledge and society.

Irawan Jati
The Head of the
International Relations Department

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Investigation Students' Logical Thinking Abilities on Chemistry Learning

Yeni R. Saselah,
Muhammad Amir M and Riskan Qadar

Investigation Students' Logical Thinking Abilities on Chemistry Learning

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ABSTRACT

The study of students logical thingking ability on chemistry learning was carried out. The purpose of this study was to map students' logical thinking abilities students for learning chemistry. A total of 39 students of SMK-SPP Negeri Samarinda grade eleventh Agribisnis and Horticultura Program participated in the study. Test of Logical Thinking (TOLT) was administered to determine students' reasoning abilities. Quantitative descriptive was used to analize the datas. The result shows that 84,62 % students for concrete levels, it consist of male 58,97 % and female 25,64 %. Further, 7,69 % male students found at trantition level and 7,69 % students for formal level, each 2,56 % male and 5,13 % female.

Key Words: *logical thinking abilities, Piaget, students' logical thinking*

INTRODUCTION

The success of the learning process is influenced by the fit between the subject matter and level of thinking ability of students (Nuroso & Siswanto, 2012). According to Piaget, every individual have each of cognitive development level. Piaget stresses that as children mature mentally, they pass through four major stages of cognitive development sequentially, each stage having several sub stages. The major stages of cognitive growth are: sensory motor stage (0 - 2 years), preoperational or intuitive stage (2 - 7 years), concrete operations stage (7 - 11 years) and formal operations stage (11 - 15 years) (Simatwa, 2010). Formal reasoning is characterized by the ability to think about abstract ideas, organize ideas, logical thinking, reasoning about what will happen later.

The relationship between prior knowledge, reasoning ability, achievement and gender has received special attention in science education research for many years (Yenilmez, Sungur & Tekkaya, 2006). Throughout the courses taught in elementary and middle school, 'science' is the one requiring intellectual skills to collect and analyze data to solve problems. In fact, science process skills taught in elementary grades such as observing, classifying and collecting data act as prerequisites for integrating the processes usually taught in middle school grades like hypothesizing, controlling variables and defining operationally (Yenilmez, Sungur & Tekkaya, 2005).

Chemistry is one of the most important part of science that make students to understand what is happening around them. Chemistry relates generally to the structure of matter. Chemistry combines many abstract concepts, which is the basis of knowledge to learn more about the chemistry and other science (Taber, 2009). Chemistry curriculum commonly incorporate many abstract concepts, which are central to further learning in both chemistry and other sciences (Taber, 2009; Sirhan, 2007). Abstract concepts is important because chemical/ science concepts further or subsequent theories could not be understood easily if the concepts are not well understood by students (Coll & Treagust, 200; Sirhan, 2007). Empirical studies (e.g. Ben-Zvi, Ey lon, & Silberstein 1986, 1987) have shown that learning the microscopic and symbolic representations is especially difficult for students because these representations are invisible and abstract while students' understanding of chemistry relies heavily on sensory information (Wu, Krajcik & Soloway, 2000).

Actually it is still aligned with the level of students' thinking which has entered formal thinking according Piaget level, that the ages of 11-15 years and over able to think abstractly. Ben-Zvi, Eylon, dan Silberstein (Wu, Krajcik & Soloway, 2000) find many students senior high school which has not reached the level of thinking that difficulties in understanding chemical concepts. With the result that students who studied chemistry just memorize chemistry concepts without understanding the concepts.

Throughout the courses taught in elementary and middle school, 'science' is the one requiring intellectual skills to collect and to analyze data to solve problems. Flavell mention that Jean Piaget's theory of intellectual development (Simatwa, 2010) is considered a leading theory on cognitive development.

Piaget viewed constructivism as a way of explaining how people come to know about their world. He buttressed this explanation with extensive documentation of behaviors he witnessed and with well-support ed inferences about the functions of the mind. Piaget (1952) viewed the human mind as a dynamic set of cogn itive structures that help us make sense of whatwe perceive (Brooks, J. G., & Brooks, M. G, 1999).

Piaget also states that children are considered ready to develop a concept or special material when obtaining the necessary schemata. This means that children can not learn if you do not have the cognitive skills. This means that the learning process becomes blocked when students do not have formal reasoning as required.

UPTD SMK-SPPN Samarinda have their own mapping in recruiting student based farming region spread in East Kalimantan. So that the school has the capability profile of students who are very diverse, especially coming from the rimland.The ignorance of teachers to the theory of cognitive development that has resulted in the settlement of existing problems in learning and follow intuition teaching experience.

With the result, it is necessary to conduct research cognitive development according to Piaget. Because according to their age they should have in the thinking stage of formal operations (Simatwa, 2010). The teacher's knowledge of the cognitive development of students made the teachers can plan the exact method that can be used in the learning process happens in the classroom.

METHOD

Sample

A total of 39 students (27 male and 12 female) of SMK-SPP Negeri Samarinda grade eleventh Agribisnis and Horticulture Program participated in the study.

Instrument

The Test of Logical Thinking (TOLT), developed by Tobin and Capie (1981), was used to determine the formal reasoning ability of students. The test consists of ten items designed to measure proportional variables (1-2), controlling (3-4), probabilistic (5-6), correlational (7-8) and combinational reasoning (9-10). Students select a response from among five possibilities and then they are provided with five justifications to choose from (A. Yenilmez et al, 2006). In the first 8 questions, the student is asked to provide the correct answer and the reason that this answer is correct. Both the answer and reason must be correct for the student to be awarded a credit. The last 2 questions involve combinatorial reasoning and require the student to enumerate the possibilities. The score on the TOLT is an integer value between 0 and 10. For each question correctly answered, the student receives 1 point, and for each question with a wrong answer, the student receives 0 points (Etzler and Madden, 2014)

Procedure

In each class, students are informed about the purpose of the questionnaire and the procedure for completion. After this short explanation, the answer sheets were distributed, and students were required to complete the personal background information on the answer sheet. They were instructed to think about each question and answer it as it applies to them. Then, the tests were distributed and students were asked to complete the questions on their own. It took about 40 minutes for students to complete the test.

Data Analysis

This research was quantitative descriptive study, the research described the mapping of formal thinking skills class XI student of Agribusiness and Horticulture Program SMK-SPPN Samarinda. Therefore, the data were analyzed by quantitative descriptive.

RESULTS

The TOLT scores of the 39 students ranged from 0 to 5. The average age of the students taking the test was 15-18 years. The youngest students were 15 years old and the oldest student was 18 years old. Nevertheless, age of the students was not a significant factor relating to the TOLT score. Sixty nine percent of the students taking the TOLT were male. There was no significant difference between TOLT score and gender and the average TOLT scores of each gender were nearly the same.

Descriptive statistics are used to see the distribution of student TOLT results shown in Figure 1, Figure 2 and Figure 3. In this study, the performance of students at TOLT also used to categorize the stages of cognitive development by Piaget criteria of students in detail divided on a concrete level, transition, and formal. Formal stage was also divided into two parts, the formal stages and the final stage of formal. In this study, the performance of students at TOLT also used to categorize the stages of cognitive development by Piaget criteria of students in detail divided on a concrete level, transition, and formal. Formal stage was also divided into two parts, the early formal stages and the final formal stages (Valanides, 1997). The results are presented in Figure 1.

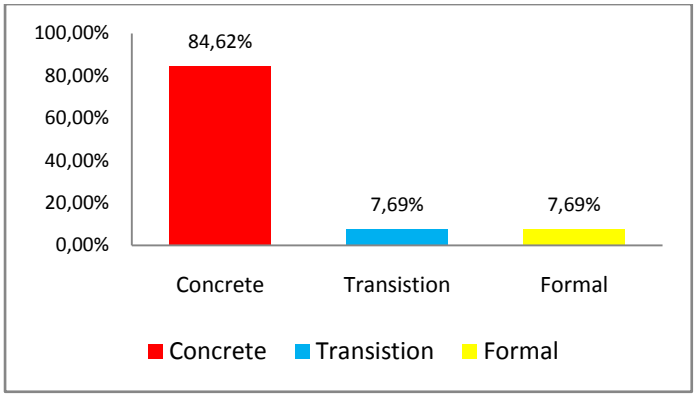

Figure 1. Students Mapping Cognitive Development

Students mapping cognitive development by gender differences were presented in Figure 2. As shown in Figure 2, only a minority of students have reached the formal operational stage. Of the total study sample as many as 39 people had been found as many as 33 students at the level of concrete thinking (84,62%), three students at the level of thinking transition (7,69%) and 3 students think early formal (7,69%). The persentages of the male students more than the female studenst in the concrete and transtition level. Eventhough, the highest percentages in the formal level were the male students.

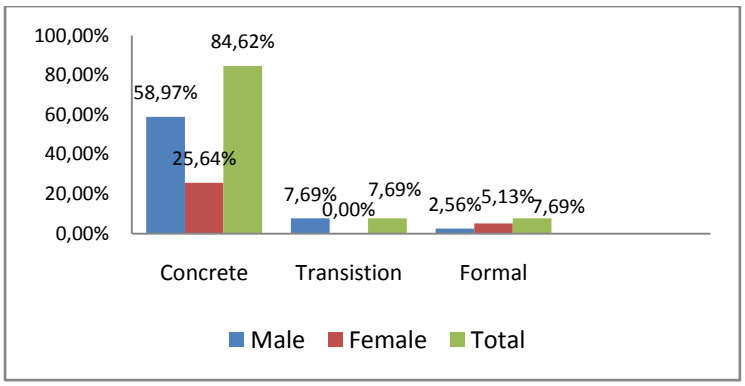

Figure 2. Students Mapping Cognitive Development by gender

Students mapping four of cognitive development male and female were presented in figure 3.

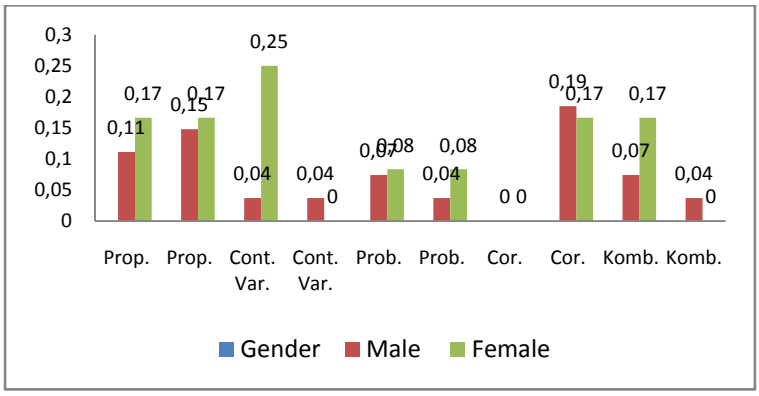

Figure 3. Students Mapping Cognitive Development Male and Female

Based of figure 3 female students got score higher than male students in proporsional logic level, controlling, probabilistic and combinational reasoning. But in correlational level, male students got score higher than female.

DISCUSSION

If categorized in stages of cognitive development just a little students have entered the formal stage. Most of student at the stage of concrete. This means they are still not able to predict the final answers so that any data and information geared towards achieving that goal.

The ability to think of students who have not entered the stage of formal thought would make them difficult to understand chemistry. Because chemistry is generally combin es many abstract concepts, which is the basis of knowledge to learn more about the chemistry and other sciences (Taber, 2009).

Individual differences in cognitive development refers to the difference in capacity and speed of learning chemistry. Individual differences learners will be reflected on the nature or characteristics of their abilities, skills, attitudes and habits of learning, as well as the quality of the learning process and results either in terms of cognitive, affective and psychomotor.

The teaching methodology and teaching materials, and the learning activities should be those that are appropriate to each of the cognitive developmental stages of the learners. Since the theory says that there is a mutual interaction between the learner and the environment, teaching materials should come from the learner's environment (Simatwa, 2010). The learning model that we can use is contextual learning model or could be combined with other learning model that is essentially rooted in the daily lives of the students.

Teachers as instructional managers should use the hierarchy to: understand why children think and reason as they do; and to help the pupils`s master intellectual processes at the appropriate age (Simatwa, 2010). Each student has different intellectual capacity. Children at various ages have different capacities for attention and comprehensive.

Piadget opined that teachers as learning managers must ensure that the learning environment should be rich in physical experiences because intellectual development stage depends on the activity. Student activity is the key to intellectual development. How teachers manage the class will be visible from how independent and how creative the students are in the classroom (Brooks & Brooks, 1999). Curriculum, learning and task developers must make a special effort to understand the world of children. They should not assume that what they think is good for children is certainly good for the child. They can design an educational experience based on the needs and readiness of children (Simatwa, 2010).

Chemistry teachers' understanding of students' logical ability thinking can make teachers plan learning chemistry better and stimulate students' ability to think logically. For instance, teacher could create multimedia to explain abstract concepts in chemistry learning.

Here are some practices that can maximize cognitive functioning of students in remembering, understanding, and applying knowledge of chemistry or other science.

1. Make learning relevant and activate prior knowledge (Shodri, 2012). Use of the early organizers (analogy, elaboration) with students to help activate their previous knowledge. Teacher can use visual image or animation to present microscopic level in chemistry matter. The cognitive processes involved in comprehending a visual image can be described on various levels. At a minimum, they include (a) identifying the important features of a visual display, which is referred to as surface-level processing or external identification, (b) relating the visual features to their meaning, i.e., semantic processing, and (c) constructing the communicated message, i.e., pragmatic processing (Plass, Homer and Hayward, 2009).
2. Organize information. Teacher should try to be well informed on how the students interpret ideas which come up in class by encouraging free discussion. He should also watch for the tendency of the adolescent to

indulge in unrestrained and unrealistic political theorizing. The teacher may handle such immature forms of thinking by helping students realize that they have overlooked certain considerations. Another example is classifying specific issues under the more general problem (Shodri, 2012).

3. Using questioning techniques. Presentation of questions prior to the introduction of teaching materials to help students learn the material related to the teaching (Shodri, 2012). Teachers encourage student inquiry by asking, open questions and encourage students to apply for a review question one another. Teachers always engage students by experiences which could make contradictions between each student. So there will be a discussion of hypotheses and perspectives. Teachers can not know what will be perceived as a contradiction for the students, this is an internal process. But teachers can and should challenge students' conceptions of this, knowing that the challenge only if the student considers contradictions. Teachers directs the student's perspective to help them understand what the idea of another student and enable them to accept or to reject the conflicting views (Brooks & Brooks, 1999).
4. Using multimedia interactive for abstract concepts. The analysis further revealed that dynamic visualizations are more effective than static visualizations only when they are of a representational rather than decorative nature. The analysis also showed a larger benefit of dynamic over static visualizations when the target knowledge was procedural motor knowledge rather than procedural or declarative knowledge (Plass, Homer, and Hayward, 2009).

Some of the above can be applied by teachers in order to help the cognitive functioning of students in chemistry and learning in general. After applied then there will be implications in learning, it is easier for the students to process information and knowledge then will have implications on their learning outcomes as well

CONCLUTIONS

The study conclude that the total study sample as many as 39 people had been found as many as 33 students at the level of concrete thinking (84,61%), three students at the level of thinking transition (7,69%) and three students think formal (7,69%).

Chemistry teacher plays an important role in helping and facilitating students to learn chemistry in accordance with ability and cognitive development of students. Teachers as learning chemistry managers in the class should ensure that the learning environment should be rich in physical experiences for growth in one stage depending on the many activity.

REFERENCES

Brooks, J. G., & Brooks, M. G. (1999). *In search of understanding: The case for constructivist classrooms*. ASCD.

Kozma, R., and Russell, J. (2005). Multimedia learning of chemistry. *The Cambridge handbook of multimedia learning*, 409-428.

Nuroso, H., & Siswanto, J. (2012). Model Pengembangan Modul IPA1 Terpadu Berdasarkan Perkembangan Kognitif Siswa. *Jurnal Penelitian Pembelajaran Fisika*, *1*(1/april).

Ojose, B. (2008). Applying Piaget's theory of cognitive development to mathematics instruction. *The Mathematics Educator*, *18*(1).

Plass, J. L., Homer, B. D., & Hayward, E. O. (2009). Design factors for educationally effective animations and simulations. *Journal of Computing in Higher Education*, *21*(1), 31-61.

Shodri, Hilman. (2012). *Perkembangan Kognitif*. http://hilmanshodri.blogspot.co.id/2012/06/perkembangan-kognitif.html. Diakses pada tanggal 27 September 2017 pukul 02. 00 wita.

Sirhan, G. (2007). Learning difficulties in chemistry: An overview. *Journal of Turkish science education*, *4*(2), 2.

Simatwa, E. M. (2010). Piaget's theory of intellectual development and its implication for instructional management at pre-secondary school level. *Educational Research and Reviews*, *5*(7), 366.

Taber, K. S. (2009). Learning at the symbolic level. In *Multiple representations in chemical education* (pp. 75-105). Springer Netherlands.

Tobin, K. G., & Capie, W. (1981). The development and validation of a group test of logical thinking. *Educational and Psychological Measurement*, *41*(2), 413-423.

Treagust, D., Chittleborough, G., & Mamiala, T. (2003). The role of submicroscopic and symbolic representations in chemical explanations. *International Journal of Science Education*, *25*(11), 1353-1368.

Valanides, N. (1996). Formal reasoning and science teaching. *School Science and Mathematics*, *96*(2), 99.

Wu, H. K., Krajcik, J. S., and Soloway, E. (2000). *Promoting understanding of chemical representations: Students' use of a visualization tool in the classroom*. Journal of research in science teaching, 38(7), 821-842.

Yenilmez, A., Sungur, S., & Tekkaya, C. (2005). Investigating students' logical thinking abilities: the effects of gender and grade level. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *28*(28).

INVITED SPEAKERS

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