Reflective-Metacognitive Learning (RML) in Achieving Higher Order Thingking Skills (HOTS) of KKNI Curriculum

Reksiana[1*], Asep Abdul Aziz[2], Ida Putri Rarasati[3]
[1] *Institut Ilmu Al-Qur'an Jakarta, Indonesia*
[2] *Universitas Islam Negeri Sunan Gunung Djati Bandung, Indonesia*
[3] *Universitas Islam Balitar, Indonesia*

Corresponding Author: Reksiana, ✉ reksiana@iiq.ac.id*

ABSTRACT

This research based on the problems of the learning system in Indonesia which national and international scale. At this time learning must be oriented in Industrial Era 4.0 and the educational paradigm must be changed in systems thinking to the top level of Bloom revised taxonomy. The researchers analyzed how to apply using Reflective Metacognitive Learning (RML) model and integrated Garrison, Anderson, and Archer model to achieve Higher Order Thinking Skills (HOTS) of KKNI Curriculum at Institut Ilmu AL Qur'an Jakarta in Islamic study program. This research based on a qualitative approach with descriptive analysis method. The data was obtained from the fifth semester students of Islamic Education Program of Institut Ilmu Al-Quran (IIQ) Jakarta and from all relevant sources such as interviews, observations, and documentations. The findings showed that the application of the Reflective-Metacognitive Learning (RML) model integrated with the Garrison, Anderson, and Archer model was found in the four critical thinking skills of (IIQ) Jakarta students in learning, for instance: (1) students are quick to respond to events (trigger event), (2) students are more able to explore (exploration) (3) students can integrate knowledge into the context of learning (integration) and (4) then students propose (resolution). It was important that the application of these two models can improve the learning process and level of thinking of Higher Order Thinking Skills (HOTS) metacognitive levels.

Keywords: *High Order Thinking Skills, Reflective-Metacognitive Learning, KKNI Curriculum*

INTRODUCTION

At present the new paradigm of education in the era of globalization was internally, for instance the quality of education in Indonesia, especially higher education has a very high disparity. It was informed by Ministry of Research, Technology and Higher Education (that the graduate students don't have equal qualification either graduates or the study program. Moreover, it cannot be distinguished between graduates (outcomes) of academic type education, with

vocational and professional professions (Yunanto & Herilina, 2019). The other problem come from the results of international studies. It can be proven from reading and literacy of PIRLS (Progress in International Reading Literacy Study), that informed more than 95% of Indonesian students in grade IV elementary schools were only able to study in the middle level. Furthermore the results of the PIRLS study (Progress in International Reading Literacy Study), Indonesia ranked 45th out of 48 participating countries with a score of 428 from an average score of 500 (Tahmidaten & Krismanto, 2020; IEA 2017; Kobakhidze, 2016). These data above can be indicated that education in Indonesian country was still be worried about or at a low level on the international achievement index. The other indications were also analyzed from the PISA study (2017) in the fields of literacy, mathematics, and science that shows Indonesia occupies the bottom 10 of 65 countries. It the same as the study of the TIMSS (Trends in International Mathematics and Science Studystudy), showed Indonesian low skill at : (1) understand the complex information, (2) the theory, analysis and problem solving, (3) use of tools, procedures and problem solving (4) doing investigation (Steiner-Khamsi & Waldow, 2018; Kobakhidze, 2016). Review from study above, Indonesian students are still low interest in literacy. Moreover, the quality of education must have and adjust the quality parameters that will be applied to standardize the quality of graduates at various levels such as primary, secondary and high school.

Oviyanti (2016) & Putra (2019) gave the response that in improving the quality of learning and teaching, teachers must be able to develop three basic intelligence of students, namely; intellectual, emotional and moral of students. These elements must be present in the student as strongly as possible. And the spiritual dimension of students was applied by students. In addition the other researchers confirmed that need to emphasize the need for changes in educational paradigms that can accommodate various aspects of life lines such as: (1) changes from the outlook of life of local communities to the world community (global) including the digital era (era industry 4.0), (2) change from social cohesion to democratic participation (mainly in the education and practice of citizenship), and (3) change from economic growth to human development regarding quality human resources.

Thus, an inevitability of a change in learning system paradigm that is more improved at the level of thinking of students that was applying the Higher Order Thingking Skill (HOTS) system (Eliyasni, Kenedi, & Sayer, 2019). For this reason, the curriculum is being developed and applied in Indonesia in the curriculum 2013 for unit's education. While in institutions, Kerangka Kualifikasi Nasional Indonesi (KKNI) curriculum was reformed by applying the Higher Order Thingking Skill (HOTS) system (Sağsan et al., 2016). Thus, the KKNI curriculum can be developed in setting learning objectives, learning design, and planning in the evaluation system process. Related study about Higher Order Thingking Skill (HOTS) system on the metacognitive aspects, has revealed the importance of learning achievements that emphasize the metacognitive aspects of students (Weinberger & Libman, 2018; Muhali et al.,

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2020). It has the function for the needs of high-level thinking skills, especially metacognition to students. This achievement can be developed with a Reflective-Metacognitive Learning (RML) model. It is also relevant to the learning process which is integrated in Blanded learning model: that is learning to use syntax-syntax-face learning model and online learning.

The study Ismirawati et al., (2015) revealed the importance of learning that emphasize of metacognitive achievement on Higher Order Thingking Skill (HOTS). They reported that metacognitive skills are proven to be implemented through the ER-CoRe learning development model, and this model needs to be integrated with constructivist theory-based models with cooperative learning models and those that empower students' metacognition skills. Meanwhile, if analyze of the findings from Nurismirawati et al., (2015), was unfortunate, because their findings have not shown positive results, students lack metacognitive skills and teachers still do not understand metacognitive empowerment.

The differences were also seen in the some aspects for instance subject of Ismirawati's research was Student of senior high school (10 students), while the researchers used students university. Another difference was seen in the metacognitive development of Plomp Model (Alkhaira & Yerizon, 2019; Purnamawati et al., 2017; Purnamawati et al., 2018), with development model: 1) initial investigation, 2) design, 3) realization or construction, 4) test, evaluation, revision, and 5) implementation, while the researcher used development model the Reflective-Metacognitive Learning (RML) and integrated with Garrison, Anderson, and Archer model.

Hanifah (2019) & Hayikaleng et al., (2016) provided that the system of Higher Order Thingking Skill (HOTS) was proposed by Bloom's Taxonomy emphasized of Lower Order Thinking Skills (LOTS). Then this taxonomy experienced changes or revisions by Anderson dan Krathwol in (Dinni, 2018) and finally revised formulations by Amrzeno (Dubas & Toledo, 2016). Higher Order Thingking Skill (HOTS) were indispensable in the current Industrial era 4.0, and each has advantages and specialties. The implementation of HOTS learning system has already been applied to the KKNI curriculum at the Islamic Education Program, for instance Islamic Education Program at Institut Ilmu AL Qur'an Jakarta. In learning process, it has applied Reflective-Metacognitive Learning (RML) Model and integrated with Garrison, Anderson, and Archer Model. This model was very relevant to the demands of KKNI curriculum in the institutions at this time, which emphasizes the ultimate achievement of each learning activity that must be able to refer to the qualification level of KKNI curriculum. The learning that has been applied to the lecture at Instiutt Ilmu AL Qur'an Jakarta have adjusted to the KKNI curriculum. Where the learning process that was applied truly integrates with the learning material and formatted according to the achievement, either levels or subjects known as learning outcomes taxonomic level Bloom revision. This step was seen in the achievements of the Syllabus and RPS in the course. Then, on the achievement of knowledge and cognitive process dimensions, according to the four pillars of

learning that have characteristics that reflect the nature of interactive, holistic, integrative, definitive, contextual, thematic, effective, collaborative and student-centered. Based on the review above, the researcher analyzed how to apply using Reflective-Metacognitive Learning (RML) model and integrated Garrison, Anderson, and Archer model to achieve Higher Order Thingking Skills (HOTS) at Institut Ilmu AL Qur'an Jakarta in English study program.

METHODS

This study used qualitative approach, with the type or research of Descriptive Analysis Method (Killam & Heerschap 2013; Moser & Korstjens, 2018). The researcher conducted this research at Institut Ilmu AL Qur'an (IIQ) Jakarta. In collecting the data the researchers used observation, documentation and interview. The main data sources involve lecturers of Islamic Education Program, Syllabus, RPS and Observation. The sample of this study was taken from the students in the fifth semester that consist of thirty students. The researchers' reason put this sample because also teach in this class, and interact regularly. And when analyzed from individual characteristics, the class has characteristics that meet the data standards required in high average GPA.

While the secondary data obtained from dokumenutasi Guidelines for Curriculum Menristekdikti 2014 and 2016, journals, articles, newspapers online(online) and includes standards in the form of product legislation relating to the national education system, especially directly related to the dynamics of the curriculum in Indonesia from various phases of thelearning system Higher Order Thingking Skill (HOTS) in the IQF Jakarta curriculum at IIQ Jakarta tertiary institution as well as the KKNI Curriculum Guide for the Tarbiyah Faculty of Islamic Education Program. An observations in the form of field notes such as giving field assignments to schools and documentation in the form of photographs of activities either in the classroom and activities in school and audio. Furthermore, The informants interviewed were three lecturers, five students and dean at Institut Ilmu AL Qur'an (IIQ) Jakarta.

Data analysis techniques use inductive data analysis of the model Miles and Huberman (Conway. 2015). The stages by the researcher in analyzing the data are as follows; firstly, collecting data relating to research from experts' discussions and previous research in the form of books, journals, and theses. Secondly, combine information that has been obtained from observations in the field. Thirdly, analyze the results of interview data that has been done and strengthened by theory, journals, observations, and documentation.

RESULT AND DISCUSSION
Analysis Learning Activities of Reflective-Metacognitive Learning (RML) In Achieving Thinking Higher Order Thinking Skill (HOTS)
Problem Identification Phase:

In the application of Garrison, Anderson, and Archer's Higher Thinking Order Skill (HOTS) Learning system divides four critical thinking skills, namely: (1) trigger event or rapid response to events, which is identifying or

recognizing problems, dilemmas from one's experience quickly, (2) exploration/thinking, thinking about personal and social ideas in order to make decision preparations, (3) integration, which is constructing the intentions of ideas and integrating relevant information that has been determined in the previous stage, and (4) resolution / proposing, which is proposing a possible solution, or applying a solution directly to an issue, dilemma, or problem and testing ideas and hypotheses (Hidayah et al, 2017). Inquiry learning model built through the COL learning model can support students in linking the knowledge they have just learned with their experiences to build a deep and meaningful understanding. In the stage or phase of presenting the problem, the lecturer/educator tries to explore the student's fundamental knowledge by presenting an advance organizer and stimulating the experiences of the students they have gained.

In addition to the Garrison, Anderson, and Archer models or expertise of the COL model for learning activities. Reflective-Metacognitive Learning (RML) model is also a learning model for higher-order thinking skills, particularly student metacognition. Metacognitive knowledge and awareness of the cognition process or knowledge of the mind and how it works. The solution of chemical problems requires metacognitive involvement (Muhali, Yuanita, & Ibrahim, 2020). Each student has different metacognitive abilities. The level of metacognitive students involved in solving material solubility problems and the results of solubility. RML model is also an apprenticeship model that is built with a reflection on every level of learning, which stimulates the process of conscious thinking to enhance student metacognition through four phases: (1) Reflection Orientation; (2) organizational reflection; (3) reflections on Execution; and (4) reflection verification. The COL and RML models are therefore very well suited for integration in lectures. This is based on the theoretical and empirical support which adapts metacognitive, cognitive models and problem resolution models (Veenman, 2012). The existence of reflection activities at the end of each phase of learning through different forms of activity (De Jager, 2019). These include the presentation of the phenomenon of cognitive conflict, the presentation of anomalous phenomena, internalization (through the presentation of problems or concepts) and the presentation of new phenomena that are still referred to decision-making. Reflection plays an essential role in teaching students metacognition, and refection can play a role in monitoring the knowledge process of students.

The results of the metacognition activities may include general provisions for students, such as the classification of information relevant to the problem at hand, or maybe in the form of specific results, such as finding specific solutions following the correct theory or concept to help students solve the problem at hand.

Orientation Reflection Activities

The first stage of lecturing activities by lecturers and students is Orientation Reflection. It is called the initial step of receiving information at this

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point. This initial stage, seen from the Syllabus and RPS, is referred to as a lecture contract and the second and third meeting, where the lecturer transmits the subject for one semester, related to the orientation of his lectures. In this phase are four main activities: 1) delivering objectives for lecture, 2) providing information analysis, 3) assessing familiarity with the material/task, 4) evaluating problems and opportunities at difficulty levels and 5) reflecting orientation activities with the provision of the phenomenon of cognitive conflict.

There are some stages in implementation of the process of acquiring knowledge information as basic knowledge in the following learning material. At this stage, students are also encouraged to have fundamental knowledge that is built by themselves through the problems they face. In this phase, the lecturer presents a description of the lecture; as stated in the Syllabus / RPS, the lecturer presents the orientation of the material and issues related to the material to be discussed. The purpose of this phase, according to Muhali et al., (2018), is to provide motivation/motivation, prepare and attract attention, and focus the attention of the students. This activity is also known as apperception in learning activities

Organizational Reflection

At this stage, it is called the Data Organization or the Discussion Group Division. This phase consists of two stages, namely: 1) the students evaluated the discussion section or groups, then 2) the students formulated hypotheses, to define the operational variables in the learning process, to determine the problem-solving steps that will be used.

Figure 1. The Discussion of Students in Learning Materials

Figure 1 reported that after students were divided into several groups, students begin to discuss the material learned by observing the students' differences and analyze the issues and the material under discussion. Students are also directed and grouped at this stage by lecturers with different cognition groups. This segment aims to enable less talented students to observe students who are more intelligent in learning. The students was less intelligent can do

the same thing as intelligent students to learn faster and better. All students can find several excellent learning features to improve their learning quality. Initial and final objectives are identified, and the planning is based on the identification of problems in Phase 1 that further organizes settlement in the form of logical reasoning (hypothesis and operational definitions of the variables observed).

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Execution Reflection

In the first step, the professor directs/asks students to make observations to solve problems according to the plans formulated. Besides, during this level, students carefully follow preparation. They carefully observe the suitability and interrelation of each level of problem-solving. Careful preparation demonstrates that right information can be measured. Then students carefully monitor the planning and observe the adequacy and interaction of each problem-solving step. Attentive planning demonstrates the ability to assess good knowledge. In the second phase, the teacher determines how special and general planning is executed. The teacher evaluates at this stage, the performance of problem-solving based on the students' smooth and accurate problem-solving following observations in the field.

Figure 2. Students' Learning Process

The third stage is the decision-making process. Students in these phases formulate decisions through the evaluation of hypotheses and based on data and informative analyzes derived from sources of information and the field. The last stage of reflection is that students reflect through the internalization process, i.e. the presentation of associated phenomena which must be resolved

following the problems solving steps previously done after the discussions and the field observation activities. According to Muhali et al., (2018), in practices such as the above process, students' metacognition skills are closely correlated with their learning activities. Moreover, a person also discovers during the process activities such as reading and reviewing assignments, activating fundamental knowledge, formulating goals and preparation and observation, or moving into the field to discover the symptoms of learning.

The problem-solving exercises with valid, science and practical learning instruments are beneficial. The use of metacognitive approaches with students ' expectations allows learning easier to adopt, provides guidance for reflective thinking and allows analogies easily understood by students . Such exercises are strategies for problem-solving. The metacognition measures are used to regularly schedule or change the plan as necessary to observe and test, take notes, and to control the time and source. These activities can guide and monitor the implementation of problem-solving in order to observe performance assessments and their connections with goals, the collection of information and the reflections on the learning process.

Reflection Verification

After the students do field activities or make observations, Reflection testing is the next stage and activity. The teacher's position in this stage is as an assistant and mediator. The instructor discusses and tests the problem-solving method of the study and its processes in the field. The instructor then considers student feedback as proof of learning experiences (reports are collected) and offers graded assignments for follow-up learning. Tasks in the advanced activity phase developed based on the reflective metacognitive model given to students. Here is a description of the reflective phases: Firstly, final decision-making: after observing in the school and the city, the lecturer asks students to explain the effects of the implementation of the problem-solving strategy. The professor then instructs students to explain the importance of problem-solving outcomes in the global goals they have developed before they encounter phenomena/symptoms in school/field. Secondly, the process of reflection is the presentation of new phenomena that remain to be resolved. Activities conducted by students in the form of observations and phenomena identified orally with their respective discussion groups in the field. The lecturer will then direct and evaluate every study they present. Then students must think about and re-analyze the lecturer 's instructions and explanations. The third step is the processing of data. After students submit their findings verbally, the students then process the data in the format decided by the campus by drawing up scientific reports.

At every point of the model, this process introduces reflective activities. This attribution is significant because it is the core of the ability of metacognition itself. Moreover, it can provoke student awareness of the cognition that is owned and the processes that have been experienced to get the cognition itself. Teachers in this process are asking students to explain the

effects of the implementation of the problem-solving program and to ask students to explain the connection of the effects of problem-solving with the global goals previously formulated. That is a higher level of thought, so the test or assessment must, therefore, be capable of assessing the higher level of thinking skills.

The finding showed that the application of the Reflective-Metacognitive Learning (RML) model that is integrated with the Garrison, Anderson, and Archer version models, which are found four critical thinking skills of IIQ Jakarta. These include (1) students are quick to respond to events (trigger events), (2) students are more able to explore, (exploration) (3) students can integrate knowledge into the context of learning, (integration) and (4) further students propose (resolution) related to what they have experienced and get in the field. At this stage of resolution, the students propose hypothetical solutions, or apply solutions directly to the issues, dilemmas, or problems they have encountered in the field and test ideas and hypotheses. The application of two models have proven in improving the learning process and the level of thinking of students of the Islmaic Education Study Program at IIQ Jakarta. The application of reflective attributions in each stage of learning, was to activate the process of thinking consciously to improve students' metacognition abilities through four phases, for instance (1) Reflection Orientation; (2) Organizational Reflection; (3) Execution reflection; and (4) Reflection Verification. As the result between the COL and RML models, are very suitable to be integrated in lecture activities in the Industrial Era 4.0. It is based on empirical and theoretical support that accommodates metacognitive cognitive models and problem solving models.

The urgency of this learning model was also expressed by Muhali (2018), Because it is the substance of the ability in metacognition itself. In addition, these phases can provide feedback in the form of student awareness oriented to aspects of cognition and the processes that have been experienced by students in providing critical thinking skills. Meanwhile, Hanifah (2019) reported that to get providing in critical thinking, the role of teacher in learning model through by asking students to make an explanation of the results of the implementation of the problem solving plan and asking students to explain the relevance of the results of problem solving with global goals that have been formulated.

The present finding is also supported by Maulida and Haryani (2016), that there was an increase in students' metacognition through the learning strategy Reflective-Metacognitive Learning by integrating the material inquiry model according to the Syllabus and RPS. Through inquiry learning strategies with methods and direct learning (Problem Based Learning) to improve student metacognition. Ismirawati et al., (2015) also stated that the metacognitive abilities can be done through the application of constructivist learning models, namely the ERCoRe learning model. The ERCoRe learning model was developed with a model development procedure referring to Plomp Model (Alkhaira & Yerizon, 2019; Purnamawati et al., 2018). It consists of five phases namely, (1) the initial investigation phase, (2) the design phase, (3) the

realization or construction phase, (4) the test, evaluation, revision, and (5) implementation phase. This model can be developed with the components of the syntax learning model, social systems, the principle of reaction. In this case the teacher's role in processing learning, support systems, and instructional impacts and accompaniment impacts. The findings of Wasis et al., (2016) also showed that the instrument of higher order thinking skills assessment has some characteristics: (1) is in the taxonomy of the thought process of analyzing, evaluating, and creating / creating and being on the dimensions of conceptual, procedural and knowledge metacognitive; (2) divergent nature, allowing the emergence of several alternative responses or answers; (3) not only measure knowledge competence, but also skills and attitudes; and (4) using stimulus in the form of real life contexts or phenomena that are close to students' lives.

CONCLUSIONS

Analysis application of Higher Order Thinking Skills (HOTS) in the Curriculum Learning Process (Syllabus and RPS) KKNI found that by applying the Reflective-Metacognitive Learning (RML) model, was integrated with the Garrison, Anderson, and Archer dividing models, found four critical thinking skills, namely: (1) students are quick to respond to events (trigger events), (2) students are more able to explore, (exploration) (3) students can integrate knowledge into the context of learning, (integration) and (4) further students propose (resolution) related to what they have experienced and get in the field. At this stage of resolution, the students propose hypothetical solutions, or apply solutions directly to the issues, dilemmas, or problems they have encountered in the field and test ideas and hypotheses. The application of reflective attributions in each stage of learning, was to activate the process of thinking consciously to improve students' metacognition abilities through four phases, for instance (1) Reflection Orientation; (2) Organizational Reflection; (3) Execution reflection; and (4) Reflection Verification. As the result between the COL and RML models, are very suitable to be integrated in lecture activities in the Industrial Era 4.0. It is based on empirical and theoretical support that accommodates metacognitive cognitive models and problem solving models. So, between the COL and RML models, it is very suitable to be integrated in lecture activities in the Industrial era 4.0. It is based on empirical and theoretical support that accommodates metacognitive cognitive models and problem solving models.

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AUTHOR CONTRIBUTION STATEMENTS

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Reksiana (R) was the main author in this article. Asep Abdul Aziz (ABZ) was the second author who provided support of this research. This study was designed by researchers with background of classroom problems faced by researchers. The researchers were also a lecturer was performed teaching and learning activities in the class. The researchers were also direct participants, and really solve the events in this study. Therefore, this research was designed, and has an orientation for the improvement and development of learning models that will be implemented in the future or next semester.

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