Analysis of Level-Thinking Skills Distribution inthe Classrooms Assessment of the Elementary Schools: Based on Taxonomy Bloom's Revision Theory

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ABSTRACT: *This research aimed to describe cognitive-level-thinking's distribution in the classroom assessment based on Taxonomy Bloom's theory that used by teachers for measuring students achievements in primary schools. This research used parallel mixed-method approach. The subject consists of 102 teachers from elementary school throughout Purbalingga Regency by stratified random sampling. Datas are collected by questionnaire technique for quantitative research and in-depth interview techniques for qualitative research.The research shows that Distribution of thinking level on exercises used by teachers are dominated by lower-order thinking skills while teachers are lack of preparing higher-level thinking skills questions. Questions of Primary School has not fully included the higher-order thinking skills.*

Keywords – *cognitive level thingking, assessment*

I. INTRODUCTION

According to Organisation for Economic Cooperation and Development, global competence become an education learning outcomes in the world in this century. Global competence is complex learning goals. It is a capacity to analyze and critizise global issue and multicultural issue with a variety of perspectives, assessments, and independently and classically[1]. It has many different components whih its main focus is PISA (Programme Internationale of Student Assessments) about cognitive domain at knowing, understanding, critical thinking, and analyze which can be measuring by cognitive scale.

Global Competence underlie the global competition that need more than knowledge but also skills including critical thinking, problem solving, communication, teamwork, creative thinking, literacy, and global issue awareness[2]. In 21st Century, we need generation of critical thinkers who can solve the problem and participate to decide about local and global issue, that skills was improving by thinking process[3]. Critical thingking skills and problem solving skills can improve by instruction based thingking-skills.

Thinking process structured by revision of taxonomy Bloom consisting of remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6). Thingking-process divided into two, lower-order thinking skills (remembering, understanding, and applying) and higher-order thingking skills (analyzing, evaluating, and creating)[4]. Higher-order thinking skills can guide student's thinking process and help them to find the connection something else accurately, that's also critical thingking skills very needed in problem solving process.

In 2012, Programme International Student Asessment (PISA) as a program from OECD have examined the student ability in literacy, mathematic, sciene, and reading around the world, including Indonesia. PISA result show the Indonesian student science literacy getting ranked 63 form 64 participating country with an average score 382, it is far below the average score 494[5]. While, by the TIMSS survey, Indonesian student (8th grade) achievement in science ranked 39 from 41 participating country with score 409, far below TIMSS Scale Centerpoint 500[6] .

Low quality of education, including learning outcomes achieved above caused many factor, among other the subjets characteristic, the students, and the teachers[7]. Based on Badan Akreditasi Nasional [8] have analyzed school needs based on 8 National Standard of Education consists of Content Standard, Process Standar, Learning Outcomes Standard, Education and Educator Standard, and Evaluastion Standard it was said that there are many weakness in Evaluation Standard in school. This is evidenced by summative and

formative assessment that teachers used in school only measure lower-order thinking skills.

Linn and Grondlund [9] mentioned that assessment is the common term consists procedure for getting information about instruction from students (observation, rating of performance projects, paper-and-pencil tests) and as a reasoning for judging. Furthermore, Evaluation is a systematic process determining the extent to which instructional objectives are achieved by pupils[10]. The aim of evaluation is for: 1) keeping track; 2) checking-up; 3) finding-out; and 4) summing-up[11]. Evaluation (assessmen) in the classroom including: 1) selected response and short answer; 2) extended written response; 3) performance assessment; 4) personal communication[12].

This research is analyzing about selected reponse assessment, that was objective test. Objective test is the test which all of the information needed for answering the test already available and the students have to choose one of the alternative option[13]. The type of selected response assessment including: 1) multiple choice; 2) true-false; 3) matching; 4) fill-in questions[12]. It is used for measuring the students skills, especially on cognitive domain. Bloom taxonomy classified thingking skills into two, higher and lower order thinking. There are knowing, comprehension, understanding, applying, sintesis, and evaluating.

Anderson and Krathwohl [4] have been revised Bloom taxonomy as a conceptual framework of thinking skills by changed the classification became two dimensions, namely knowledge dimensions and cognitive process dimensions. Knowledge dimensions involve factual knowledge, conceptual knowledge, procedural knowledge, and metacognition. Cognitive process dimention like remembering, understanding, applying, analyzing, evaluationg, and creating replaced remembering, comprehension, applying, analyzing, shyntesis, and evaluating in Bloom taxonomy before revision. Higher-order thingking skills indicator are analyzing, evaluating, and creating[14]. The development of students higher-order thinking skills can be done by five step, specifically determine the learning goals, teaching by questions, drill before assessment, repeat, remedy, and improve instruction process, give the feedback and evaluation on learning[15].

To date, higher-order thingking skills only has been researched in secondary school or higher education as is done by O'Dowd and Gregory[16], Ramirez and Ganaden[17], Thompson[18], Lewy[19], Lissa, Prasetyo and Indriyanti[20], Vijayaratman[21], Istiyono, Mardapi, and Suparno[22], Saido, et.al[23], Hartini and Sukarjo[24]. But, based on demands of curriculum, higher-order thingking skills is the one of learning outcomes in elementary school instruction, reciprocally on the classroom assessment.

This research aims to describes: 1) cognitive domain assessment based on teachers implementations; 2) the distribution of level-thingking in classroom assessment; and 3) assessment techniques that used by teacher for measuring students skills.

II. METHODS

2.1. Subjects

This research held on October up to December 2016 in elementary school on Purbalingga Regency, Central Java, Indonesia. The subject of this research are the elementary school teachers in 4th, 5th, and 6th grade. They should have been teaching at least 10 years. Researchers also considered the variety of the schools from urban schools, rural schools, inclusive school, and faith-based school. There are 102 teachers from 42 schools.

2.2. Data Collecting and Analysing

This research used parallel mixed-methods[25]. In this design, researcher used qualitative and quantitative methods together, different analysis but same research project. Data was collecting by questionnaire for quantitative research and in depth interview for qualitative research. The questionnaire collected datas from teacher perception about higher-order thingking assessment from 102 responden who has been selected by using multi-level mixed-methods sampling[26]. The datas were analyzing used descriptive statistic and presented use table, figure, and chart.

While the qualitative datas were collecting use in depth interview and document study on teachers assessment (formative tests, summative test, and school exams tests). The informans are headmasters and teachers from five schools which selected by purposive sampling representing the school variety (urban or rural), faith-based school, and inclusive school. The qualitative data is about the implementation of classroom assessment and

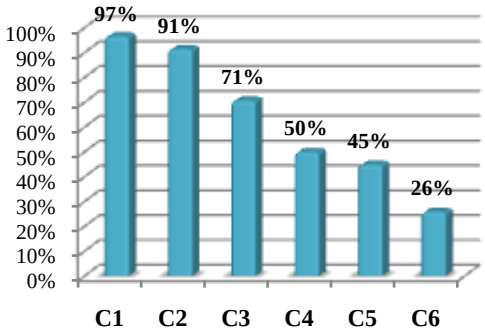
the trouble on measuring higher-order thinking skills.

III. RESULTS

3.1. Penilaian Ranah Kognitif Berdasarkan Kuesioner Guru

The result of this research is levels of cognitive domain mapping based on teacher perception and classroom assessment document. This information can used to know that what cognitive domain-level must be improve.

Figure 1. The Distribution of Cognitive Domain Level Based Teacher Perceptions



Based on figure 1, we can observe that the percentation of cognitive domain-level is dominate by C1 (remembering), C2 (understanding), and C3 (applying). That are lower-order thingking skills[14]. While, the presentation of higher order thingking still very low , that 50% for C4 (analyzing), 45% for C5 (evaluating), and 26% for C6 (creating). This information indicate that teachers are not measure, assess, and evaluate on all of cognitive domain level yet, especially on higher-order thingking skills.

Theachers who have used higher-order thingking assessment measly. It is only 38 repondent or 37% teachers said that they have been implemented higher-order thingking skills from 102 respondent. It shows that more than half of teachers were not implemented higher-order thingking skills assessment yet.

3.2Analisis Distribusi Tingkatan Berpikir Menggunakan Studi Dokumen

Researcher also analyzed the assessment document from teachers test especially formative assessment, summative assessment, and school examinations. This analysis focuses on selected response tests. The results can be observe in the chart below:

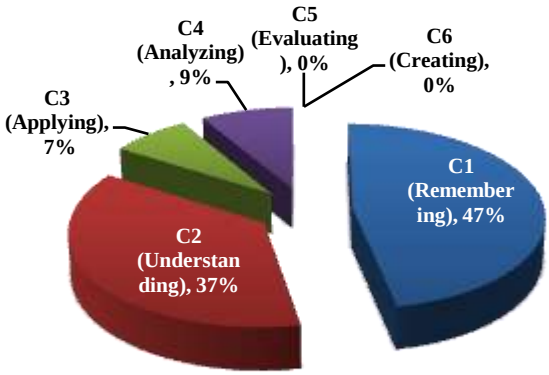


Figure 2. Distribution of the cognitive domain level based on classroom assessment document

Based on figure 2 above, we can observe that the classroom tests only provide cognitive level on remembering (47%), understanding (37%), applying (7%), and analyzing (9%). There are not the tests that provide evaluating and creating level thingking. It shows that student higher-order thingking skills are not measure enough. Teacher was only measured 1st and 4th cognitive domain level, remembering and understanding was dominated than others.

The data show teacher limitation on measuring students ability. Based on in depth interview, teachers still using standar assessment (the test made by Education Department), student book, and student worksheet. Although there are an assessment guidance from Dirjen Dikdasmen (Directorate General of Primary and Secondary Education), but teachers admitted that in classroom assessment practice, all of student skills have been not measured and mapped well yet. Teachers only measured student thinking skills on remembering, memorizing, and understanding some subject. They admitted that they did not understand and apply higher-order thingking skills assessment yet.

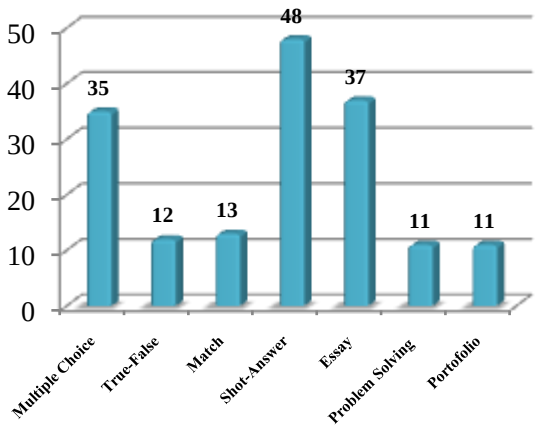
3.3. Assessment Techniques

Datas about assessment instruments that used by teachers for measuring learning outcomes in elementary school have been collected by questionnaire and document study. Based on questionnaire, 91% teachers said that they have been implemented assessment in cognitive, affective, and psycomotoric domain. The

assessment technique that mostly used by teacners for measuring cognitive domain are multiple choice test and essay.The assessment technique that mostly used by teachers for measuring affective domain is rating scale. The assessmenttechnique that mostly used by teachers for measuring psycomotoric domain are experimentation and product assessment

In cognitive domain, assessment technique that used mostly by teacher in elementary school was presented in figure below:

Figure 3. Assessment Techniques That Teachers Used



Based on figure 3, we can observe that shot-answer test is the test mostly used by teachers aside from essay test and multiple choice test. While, the true-false test and match test rarely used by teachers for measuring students cognitive domain. Nevertheless, there are some teachers have been developed another assessments techniques, problem solving and portofolio.

The questionnaire results give the same result to in-depth interview. The informans said that essay test was the mostly used by teachers for summative and formative assessment. It was selected because: a) easy to make; b) provide long and deep answer; c) does not require distractor; and d) quickly made. However, teachers also found the trouble when using essay test: a) it can not measure much subject; b) the correction process require longer time; c) subjectivity; and d) students need more time to finish essay test than the other test.

While, in the implementation of mutilpe choice test, teachers still found limitations to make a high quality multiple choice test questions. High-quality test has to became a valid and reliable test, and has an effective distractor. To formulate a high-quality questions, so many process that must be passed by teacners. It is teacner limitation, they find it difficulty to make a distractor for multiple choice test effectively.

Furthermore, teachers said that multiple choice test can be precdictable randomly by students, so that can not measure student thingking skills completely. However, teacher recognize that multiple-choice test has many advantages, among others: a) it can measure many subjects widely; b) require less time than essay tests; c) correction process faster than essay tests and also more efficient, more objective, and easy to analyze.

IV. CONCLUSION

Teachers have been implemented cognitive, affective, and psycomotoric assessment. Assessment techniques that mostly used by teachers on cognitive domain are shot-answer tests, essay tests, and multiple-choice test. Cognitive domain level in teachers tests was dominated by lower-order thinking skills tests. Classroom assessment test in elementary school were not measuring higher-order thinking skills test yet. It is seen from teachers test that just provided in remembering (47%), understanding (37%), applying (7%), and analyzing (9%). While, the evaluating and creating tests were not provided yet. It shows that student higher-order thingking skills were not measured yet, so that teachers need some assessment instrument that can measure all of students cognitive level tingking, especially higher-order thingking skills.

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