



## TRANSLATION OF AUTHENTIC ASSESSMENT INTO BIOLOGY TEACHING LEARNING DESIGN

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### ABSTRACT

Under the new Curriculum 2013 (K13), authentic assessment has become the hot issue of interest for biology teachers in Indonesia, since many teachers seem 'unprepared' to translate this alternative assessment paradigm into their instruction. Teachers are not familiar with the fundamental principles of this assessment. This study was aimed to identify the extent to which biology teaching learning designs developed by biology teachers, students, and their instructors are already coloured by the principles of authentic assessment. The research questions proposed were (1) did teachers integrate their teaching design and assessment, (2) did teachers prepare authentic tools of assessment, and (3) how was the quality of authentic assessment tools. Content Analysis of the teacher teaching learning devices was conducted on the basis of the theory of Krippendof (1989), such as: designing, sampling, raising questions to code, inferring, and drawing inferences. Data were collected from 61 syllabus and lesson plans, developed by biology teachers, instructors, teacher candidates from Semarang and its surroundings in the academic year 2014 and 2015. Research findings indicated that (1) there were no significant indicators that syllabus and its lesson plans were developed on basis of the integration of assessment and its instruction, (2) teachers only prepared limited tools for authentically assessing students, and (3) the quality of the instruments and their rubric were to be improved. In other words, biology teachers are still strongly occupied with traditional or conventional assessment paradigm (paper and pencil tests). Eventhough the conventional paradigm of assessment is still important to be used, the K13 curriculum asks more teachers to change their paradigm.

Key Word: authentic assessment, biology learning design

### INTRODUCTION

The quality of biology teaching is naturally related to the learning assessment provided by teachers. What to study in biology depends on the learning objectives set. The quality of what students learn relates to the goals. Many science teaching (including biology) standard recommends that the learning objectives of biology is not merely knowledge, skills, but also scientific dispositions. What is to be done by biology teachers is to assess authentically student's knowledge, skills, and attitudes by more precise assessment tools. This translation into biology teaching practice in Indonesia is not always easy to do.

Under the new Curriculum 2013 (K13), authentic assessment has become the hot issue of interest for biology teachers, since many teachers seem 'unprepared' to translate this alternative assessment paradigm into their instruction. Teachers are not familiar with the fundamental principles of this assessment. Eventhough many training has been provided by the Government. Biology teachers seem reluctant to

translate AA into their daily lesson planning, because of lack of knowledge, motivation and skills.

Authentic assessment (AA) is an alternative assessment in science education with different focuses. Doran (2002) wrote AA as an alternative assessment that ask students to solve problems in real word context. In his understanding, AA is non-traditional, and asking student to construct knowledge rather than to memorize, and sometime to provide more than one solution to a problem, rather than one right answer to a problem. In AA, some other alternative assessment formats are used, such as grafic organizers (concep maps, Venn diagrams, Vee diagrams), portfolios, oral presentations, interviews, skill checklists, self-evaluation, peer-evaluation, etc. While traditional assessment is more focused on selecting right or wrong answers from the list (multiple choices), and on demonstrating the aquired knowledge and skills, AA can provide students with opportunities to show what is already learned, how is learned and how is it connected to real world context. Coil (2000) stated that terms authentic, alternative and performance-based

assessment were used interchangeably. This terms indicated that they were different strategies, if compared to paper and pencil tests. AA encourages students to know what is already known, and how is learned. Students knows something when they are able to explain their work, when they are able to apply it, and when they are able to create. AA seems to be more focused on students, ownership of the problem, and self-motivation of students. AA as alternative assessments includes: student work portfolios, performance-based tasks. Student logs, rating scale, checklists, classroom discussions (when students share their work including strategies and evaluation), peer evaluation, and formal reflections (where students reflect their previous work, own progress, strength and weaknesses). According to Martin (2005) AA is more designed for describing what students can do instead of their weaknesses. AA is also a new trend of assessment. More emphasis is taken on what is more highly valued (rich, well-structured knowledge) than something easily measured (discret knowledge), on-going process of asesment than end-terms of teaching, on what teachers can do rather than external experts. Wiggins (1990) suggested that authentic assessment asked students to display their performance with their knowledge. Unlike traditional

## **METHODS**

This study belongs to qualitative content analysis. Data were collected from biology lesson plans developed by biology teachers, teacher candidates who was involved in SM-3T professional teacher education program (PPG-SM3T), pre-service students who were actively involved in curricular scanning subjects, and university teacher learning design (RPS). Content analysis was conducted on the basis of Krippendoft theory of analysis (1989), starting with (1) setting the goal of analysis, namely to find out some real indicators of AA spirit on biology lesson plan (designing), (2) collecting sampel of lesson plan to be assessed (sampling), (3) developing 5 major questions to code text messages from syllabus and lesson plan, from AA spirits such as on-going process, performance-based, self-asesments, balance, and direct feedback (coding), (4) drawing inferences of data collected, and (5) discussing findings with experts (validating). Population was all sylabus and lesson plans developed by biology educators in Semarang.

This study was focused on 64 syllabus and its lesson plans, consisted of (1) 24 lesson plans developed by biology teachers in Central Jawa, collected in 2013,

assessments more focused on asking students to recall, what they have learned and choose one correct answer from the some options available answers, AA involves students in problem situations that they might face both inside or outside of school (Glencoe, 2002: 2). Students can apply their knowledge and skills to solve realistic and complex problems (DiMartino & Castaneda, 2007). All these literature reviews underline that AA is diffrent from traditional approaches of assessment in terms of what, when, and how to assess. One of the real problems faced by biology teachers in Indonesia is how to translate AA into daily lesson planning

This study was aimed at identifying some evidences of AA translation into biology lesson plan. The research questions proposed were (1) did teachers integrate their teaching design and asesment, (2) did teachers prepare authentic tools of assessment, and (3) how was the quality of authentic assesment tools. Content analysis of the teaching learning tools developed by biology teachers were expected to provide data about the integration of AA into teaching learning process. The findings would provide a significant feedback to biology teachers, instructors, teacher candidates, and university teachers who are responsible for educating young people to be professional teachers

(2) one model of lesson plan under K13, developed by Jakarta teacher trainners, and (3) 37 lessson plans developed the SM3T teacher candidates who were participating in PPG (Professional Teacher Education) 2014 and at the beginning of 2015 at Unnes. The total number of sammpled lesson plan was 61. Sampling techniques was 'convenient sampling techniques.' Checklist was used to collect data about the integration of AA into daily lesson planning. This checklist was focused on 5 major questions, namely (1) do teachers assess students before, during, and after class (countinous assessment, formative and summative assessment), (2) do teachers implement performance-based assessment, (3) do teachers prepare balaced assessment (cognitive, affective, skills), (4) do teachers provide students with self and peer-asesment (self-evaluation), (5) do teachers use alternative tools of assessment (product, grafic organiser, portfolio, etc). All data were qualitatively assessed. Six major principle of AA (Bridges, L, 2004) are (1) continous, informing every aspect of teaching, teachers learn what, when, how to teach (2) integrated, students are assessed while they are involved, not just before and after, (3) focused on strength, what students

know, do, and how to use what they know to learn, (4) underlining the most significant nature of evaluation, namely self-evaluation (what, why, how), (5)

collaboration among teachers, students, parents to reflect and assess learning.

## **RESULT AND EXPLANATION**

Do biology teachers assess students before, during, and after class (continuous, formative and summative assessment)? To answer this first formulated problem, data were then collected from a collection of syllabus and its daily lesson plans in biology. All were analysed by to what extent the tools were occupied with assessment focused on before class, during the lesson and after the lesson. A collection of syllabus and its lesson plans) were taken from a variety of teachers, (1) collection of Lesson Plans developed by biology teachers from some particular schools in Central Jawa (N=24), (2) one model of lesson plan developed by Jakarta teacher trainers, and (3) collection of lesson plans developed by SM-3T teachers

Tabel 01 indicated that biology teachers in some extent assessed students before, during and after the class. In the beginning of the lesson, teachers were more likely to use Question and Answer (Q/A) to ask students for their readiness. Simple questions (open questions) were used by teachers to motivate students, but they did not use some other creative tools such as concept map, Venn and Vee Diagram, Group Visual (pictures, photos), etc. Teachers did not ask students how to study for the successfulness of their learning. In other words, teachers did not encourage students to metacognitively thinking. During the lesson, there were only two assessment tools (attitudinal observation sheet and Q/A) used by teachers. At the end of the lesson, teachers used tests, portfolios, Q/A and investigation reports. What does it mean? Teachers understand what to assess students but they have limited knowledge of how to assesses students in creative ways. Teachers are not accustomed to using some alternative assessment tools. Chiappeta (2010) underlined that developing alternative assessment tools were different from using tests and sometime was demanding. Teachers in Indonesia are still occupied with the use of test as the most familiar assessment tools. The situation is becoming worse when national examination (UN) is still considered as the valid and reliable student assessment. This is one of the significant factors of why teachers are still using 'at the end testing tools'. Interviewing biology teachers at Semarang suggested that teachers are not confident in using alternative

assessment. National examination is still highly valued by community, and teachers find it reluctant to implement AA. It is not easy to convince teachers to use AA. On the other hands, many experts recommend the use of AA as the best approaches in assessment for the era of knowledge. There are a variety of alternative assessment tools that can be used by teachers (Doran, 2002; Coil, 2000; Martin, (2005). All these books are excellent in providing some more information of what and how to assess students learning science or biology.

Do teachers implement performance-based assessment? To address this second formulated problem, data were then collected from the ways of teachers implement instruments such as: skill tasks, investigation (lab report), portfolios, and observation sheets, as they are presented on a collection of syllabus and its daily lesson plans in biology. Data was collected on how biology teachers assessed student performances. Did biology teachers ask students to demonstrate their product (creativity) rather than their understanding? Did their lesson plan record a variety of cognitive, affective and skills instruments? The findings showed that teachers implemented the limited use of skill tasks, portfolios, investigation reports, and observation sheets. Less than 32 (of 64 teachers) used a variety of performance-based assessment. This findings could be accepted reasonably due to some more information, collected from audiotaped biology teacher interviews, "teachers are reluctant to use performance-based assessments because of time demanding and consuming". Teachers seems 'unprepared' for the implementation of the new curriculum that put emphasis on the use of alternative or authentic assessment. Teachers are lack of motivation to implement it. On the other hands, authentic assessment has been underlined as the most prospective tools of learning assessment in the modern world (Coil, 2000; Council, 2013); Curtis, 2014; James, 2014). Indonesia, under the new curriculum 2013, is basically aware of the importance the new trend of assessments, as indicated by many teacher training that support the implementation of authentic assessment. From the year 2012- 2014, all schools are invited to join the training.

**Table 1.** Assesment Tools

Lesson Plan Assessment time/ Tools	Assesment Tools											
	Student-Directed									Teacher-directed		
	Perfor- mance based	Thinking process Graphic Organiserr	Port folio	Oral	Q/ A	Lab Skill check- list	Self- & Peer -	Jour- nal	C O M	Obse rvati on	Visu -al	Test
N <sup>A</sup> =24 N <sup>B</sup> =1 N <sup>C</sup> =37	Skill task	In- vesti gati on	Con cept map	V e n e	V e e							
Before	A*					v						
	B*					v						
	C*					v						
During	A*									v		
	B*									v		
	C*									v		
After	A*	v										v
	B*	v								v		v
	C*	v								v		V

Note: A\* a collection of Lesson Plans developed by biology teachers from some particular schools in Central Jawa (N=24).  
 B\* a model of lesson plan developed by Jakarta teacher trainers.  
 C\* a collection of lesson plans developed by SM-3T teachers. V = to some extent yes, implemented. (N=37)

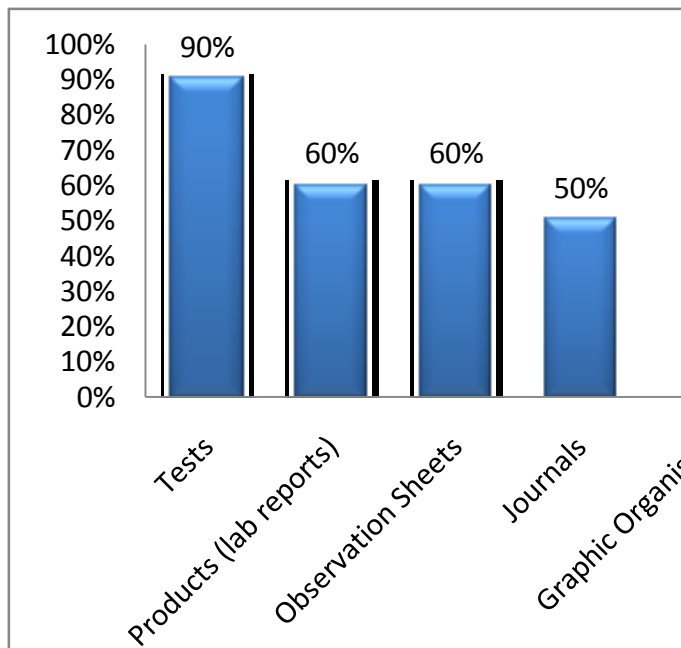
Tabel 1 presents a collection of assesment tools that can be used by teachers and students. Doran (2002) classified alternative assessment into student-directed assessment and teacher-directed assessment. Student-directed assessment covers performance-based assessment, thinking process, portfolio, oral presentation, lab skills, self- and peer- assessment, journal, and the use of computer. Teacher directed assessment includes observation and group visuals (pictures, photos, etc).

Do teachers prepare a balaced assessment (cognitive, affective, skills)? To answer this third formulated problem, data were then collected from the ways of teachers assesses student knowledge, dispositions and lab skills, using a variety of assessment tools including tests. The findings showed that many (almost all) lesson plans mentioned some major tools of cognitive, affective and skill asesments. In other words, teachers are already ready for assessing all aspect of learning (cognitive, affective, psychomotor) by the use of tests, attitudinal observation sheet, and investigation

reports sheets. This findings also indicated that teachers were already ready for ballanced assessments, including the use of testing. Since the Government of Indonesia has taken character education into his serious consideration, many parties in this country are talking about the implementation of character education at schools. That is why many teachers are aware of it.

Do teachers provide students with self and peer- assessment (self-evaluation). To answer this forth formulated problem, data were then collected from the ways of teachers encourage the use of self-evaluation and peer- assessment. The findings showed that there were limited number of lesson plans (20%) in which self- and peer- assesment were optimally used. Lesson Plans developed by the spirit of the new curriculum K13 are more likely to be coloured by the use of self- and peer- assessment. This fenomena may be due to the lack of knowledge about the nature of assessment, namely self- evaluation. Chiapetta, (2010), Lim,(1997), Bridges,

(2004) all explained clearly that nature of assessment as self-reflection or evaluation.



**Figure 1.** Alternative Assesment Tools Used.

This Figure 1 indicates that tests are the dominant tools used by teachers. Other creative assesment tools are not popular among teachers in Indonesia. Only small number of teachers used journal and observation sheet to assess student. This figure presents some information about the final research question. Do teachers use alternative tools of assessment (product, grafic organiser, portfolio,etc? To answer this final formulated problem, data were then collected from the type and total number of assessment tools used, as written in teachers' lesson plan. The findings showed that test tools were the most frequently mentioned and written. The most neglected ones were the use of graphic organisers, such as concept mapping tools, Venn diagrams, and Vee diagram, and other powerful asesment tools, such as interviews, listening instruments, groups visual and reflective journals. The findings underline that teachers are not yet familiar with alternative tools of assessment, eventhough they often go for teacher training by Government. Based on the analysis of the model of lesson plan by Government, it is clear that this lesson plan is not occupied with the alternative tools. Jakarta does not provide teachers with alternative ways of asesssing students instead of testing.

The findings are also supported by some more evidences that the Government of Indonesia is now postponing the implementation of the new curriculum to

all schools across Indonesia. Only limited number of excellent schools in some cities in Indonesia is supported to implemen it. This fenomena indicates that the Government itself finds some difficulties of the implementation of the curriculum. It creates uncertainty of the implementation of the alternative assessments. The translation of AA into daily lesson plan is not always clear.

What do the findings mean? Teaching learning design is a teacher plan of how to teach. Planning is considered something that is important. It can be imagined that teaching without a plan will be mis-directed. Koba (2015) underlines the importance of instructional framework as tools to improve the quality of biology teaching. Based on his framework, biology teachers can select strategies to support student learning. Assessment is both diagnostic and summative to determine the target of learning. In his framework, biology teaching should be divided into predictive and responsive phases, and teachers could use some interesting tools. If biology teachers are not aware of these steps, they do no know of how to support conceptual changes.

Based on the research findings, it is clear that biology teachers in Indonesia do not maximise the use of creative and reflective tools of asesments, such as concept map, Venn diagram, Vee diagram, reflective journals, so on and so forth. The direct impact of this fenomena is that the quality of biology teaching is thin (limited), merely focused on transferring knowledge, but not on scientific attitudes and skills. As mentioned by many experts biology should be presented as tools for inculcating scientific values, and thinking skills. not merely knowledge (Koba, 2015; James, 2014; Chiappeta, 2010; Doran, 2002). All these experts mentioned that instructional tools, including assessment tools, should taken into serious consideration for better learning. Since the last decade, Frangeheim (2005) also wrote some interesting teaching strategies for encouraging a thinking classroom. In his understanding, teachers should use particular tools for supporting students to think. Without tools predetermined, it is not easy to identify the quality of teaching. One of the significant problems faced by Indonesian teachers accross this country is the lack of understanding of the prospective tools of teaching.

Reflecting on the findings, they also give some pictures of how biology teachers perceive learning assessment. Many biology teachers in Indonesia still believe that assessment is separated from instruction.

They only think assessment is the end business, not integrated in their instruction. It is clear that the teachers did not listen to students before classes. They did not interview students before classes. They did not assess student before. Diagnosis and other formative assessment were not the foci of teachers. Modern practice of assessment tells the difference. Instruction and assessment are just like two sides in one coin, they can be distinguished, but not separated (Lida, 1997; Doran, 2002; Council, 2013). Many educational experts encourage the new paradigm of assessment, namely the integration of learning, teaching, and assessment. AA is being well-supported.

Based on the findings, it is suggested that the Government of Indonesia take significant steps to train teachers on how to assess students in different ways. Teacher training in Indonesia has been too much instructor-based for decades. The central government trained instructors, then they train provincial and district core teachers. Finally the core teachers trained school teachers. It takes long time to go. Misunderstanding of the use of assessment is frequently clear. The method of teacher training must be changed. School-based teacher training on assessment, focused on training by example and greater participation should be the priority of action. As mentioned by Jokowi, the young and seventh president of Indonesia, mental revolution should take place, including the changed mindset of educating young people of Indonesia. AA is the changed mindset of assessment. It must be supported by many parties in this country.

AA is to be taken into serious agenda of teacher training. The nature of AA is different from the one of paper and pencil tests. Teachers should be more familiar with it. AA is also unseparable from the implementation of competency-based education. Competency is different from knowledge gain. What was mentioned by Spady (1978), long time ago is interesting to follow. In his understanding, competency is a set of performance criteria consisted of knowledge, attitude, skills and real life experiences. If Indonesia implement the new competency-based curriculum (K13), the implementation of AA is a must. More serious and systematic efforts of its implementation should be available to all schools across Indonesia. Implementing AA in schools is not always easy, since Indonesia is a huge island country. There are problems and potentials in this country, but the possibility of AA is bigger. May this simple research

findings inspire people who love Indonesia through better education.

## CONCLUSION

Authentic assessment is being introduced to the Indonesian education system under the new curriculum 2013 where this paradigm of assessment is underlined. Unfortunately, there are some challenges, that this paradigm is not fully translated in teacher daily lesson plan, since (1) there are no significant evidences that teacher learning design are created on basis of the integration of assessment and its instruction, (2) there are only limited tools for authentically assessing students, teachers are still using paper and pencil tests, and (3) the quality and availability of the alternative instruments such as graphic organiser, portfolio, journals were to be improved. K13 curriculum asks more teachers to change their paradigm.

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