Evaluation of Authentic Assessment Implementation on Biology Learning at Senior High Schools in Semarang

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Article Info	Abstract
	Authentic assessment is an assessing technique on 2013 curriculum learning. Authentic assessment assesses learning process and students' learning outcomes. This research aims to evaluate authentic assessment implementation on Biology learning at 4 Public Senior High Schools (SHS) in Semarang. This descriptive qualitative research used CIPP (*context, input, process,* and *product*) evaluative model. The data was taken by observing, interviewing, and analyzing instrument quality used by the teacher during learning. The data was analyzed by using Milles & Huberman model which consisted of reduction, display, and conclusion. The findings of authentic assessment implementation showed various outcomes. The authentic assessment instrument development of Public SHS A, B, C, and D's biology teachers in Semarang was generally categorized excellent or high. All teachers had obtained 2013 curriculum learning training through Biology teacher discussion. The teachers were regularly supervised once in a year. The process of biology authentic assessment implementations at SHS A, B, C, and D in Semarang were categorized sufficient or moderate. The findings showed that SHS A student learning outcome average was 51; SHS B was 72; SHS C was 63; and SHS D was 73. The hindrances of the SHS A, B, C, and D's teachers in implementing the assessment dealt with cognitive, affective, and psychomotor aspects of the students simultaneously during each learning.

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INTRODUCTION

2013 curriculum policy implements *scientific* approach in learning. *Scientific* approach is an approach focusing on students. The approach requires students to actively involve and use high order thinking skills in solving daily life problems (Hariatiningsih, 2016). 2013 curriculum learning emphasizes on affective, cognitive, and psychomotor aspects comprehensively in each learning (Machali, 2014; Gunawan, 2017). Student learning assessment process has purpose to find out levels of students' skills as well as their mastered competences. The purpose of assessment is to improve learning activity (Kusuma et al., 2017).

The requirement of 2013 curriculum assessment demands teachers to authentically assess. Authentic assessment assesses all students' activities both before, during, and after learning process. authentic assessment covers several assessed aspects, such as cognitive, affective, and psychomotor aspects. Authentic assessment is a process of collecting students' learning outcomes started from cognition and performance of students during learning process, students' learning outcomes and tasks as stated by given test scores by teachers (Majid & Ika, 2012).

Current problems occurring at school are lacks of authentic assessment implementations. Several hindrances faced by teachers are - having less accompaniment in implementing authentic assessment. Although teachers are given training and supervision, but unfortunately those do not focus on authentic assessment implementation. Besides that, many authentic assessment aspects to do by teachers in each learning so it makes students having difficulty to focus on students. It is in line with Mahmud (2014) that there were many authentic assessments done by teachers causing them not focus on their students. Teachers usually promote assessment in the end of learning by giving evaluative questions. They disincline to promote authentic assessment because it takes time, cost, and effort. Their problem to promote is caused by their lack of understanding about the procedures and instruments to use (Aiman, 2016). Such though actually could hinder learning quality improvement.

Assessment should be promoted and followed up to make it in line with current applied assessment regulation system. It could be ways to improve learning qualities. To find out whether assessment process has been consistent with the procedure, an evaluation of authentic assessment implementation system needs to be carried out. It is started from planning, assessing process, and results of the assessment. Evaluation has purpose to find out successful quality in a learning (Naser & Utami, 2017). Learning implementation evaluation has purpose to review the design of an educational unit and the applied learning plan (Sumei et al., 2014). Thus, there is a need of evaluation about authentic assessment implementation in biology at Senior High Schools in Semarang.

METHODS

This descriptive qualitative research used CIPP (Context, Input, Process and Product) evaluative model. This research was conducted at Public Senior High Schools in Semarang, consisting of SHS A, B, C, and D (SMA name is disguised) during August 2019 until October 2019 in academic year 2019/2020. The subjects were teachers and students involved in Biology learning at SHS A, B, C, and D in Semarang. The objects were learning activity, authentic assessment implementation, teaching instruments, such as lesson plan, and assessment instrument made by the teachers.

The data consisted of authentic assessment implementation process taken by observation. The data of assessment instrument availability, teacher training experience and supervision concerning to authentic assessment, process of authentic assessment implementation, teacher problems in promoting the assessment, and student learning outcome were taken by interview with Biology teachers. The data quality of teaching instruments, such as lesson plan and assessment instruments which were made by the teachers were taken and analyzed by learning instrument quality analysis.

The research instrument was developed and modified from Sumei (2014) and Bhakti's (2017) research findings. The data analysis used Milles & Huberman model, consisting of data reduction, display, and conclusion (Mahmud, 2014; Rifka et al, 2017). The research was begun by analyzing learning instrument quality made by the teachers. Then, classroom observation was carried out to observe directly the biology learning activities. The last stage was interviewing the teachers concerning

with authentic assessment implementations at the schools.

RESULTS AND DISCUSSION

This research analyzes teachers' plans and assessment instruments, the authentic assessment implementation, and the students' learning outcomes. The context evaluative component analyzed learning instrument quality made by the teachers. The results of context evaluation are shown in Table 1. Input evaluation component analyzes teachers' profiles, such as obtaining training, being supervised, and joining authentic assessment implementation experiences. The results of input evaluation are shown in Table 2. Process component analyzes authentic assessment implementation during learning process. The results of process evaluation are shown in Table 3. Product component analyzes the students' learning outcomes, such as first daily examination, and second daily examination. The results of product evaluation are shown in Table 4.

Table 1 Results of Context Evaluation Taken by Analyzing Assessment Instruments Made by the Teachers.

| Aspects | Average (percent) | | | | | | | |
| | SHS A* | | SHS B* | | SHS C* | | SHS D* | |
	LP 1	LP 2	LP 1	LP 2	LP 1	LP 2	LP 1	LP 2
Affective Assessment Aspect	100	100	0	0		100	0	0
Cognitive Assessment Aspect	0	0	100	100	100	0	77	77
Psychomotor Assessment Aspect	100	100	100	100	66	100	100	100
Average	66.7	66.7	66.7	66.7	88.7	66.7	59	59
LP Average for each SHS	66.7		66.7		77.7		59	
Average Level of Authentic Instrument Arrangement **	(66.7+66.7+77.7+59) : 4 = 67.5 %							

Remark:

* A = SMAN A Smg,B = SMAN B Smg,C= SMAN C Smg,D = SMAN D Smg (pseudo names of the SHS).

**Levels of authentic assessment implementations 33.3% - 66.7% = moderate, implementation level > 66.7% = excellent/high.

Based on the data in Table 1, it could be seen that from four SHSs in Semarang, only SHS C obtained the highest average. It is 77.7% in arranging authentic assessment instruments. It was due to its Biology teacher made complete lesson plan and first assessment instrument. The assessment instruments made by the teacher consisted of cognitive, affective, and psychomotor aspects. However, the lesson plan and second assessment instrument were incomplete since there was no cognitive assessment aspect. SHS D Semarang obtained the lowest average score, 59%. It was due to incomplete teaching instruments made by the teacher. Either the first and second lesson plans and assessment instruments did not have affective aspect assessment instrument. The cognitive assessment instrument made by the teacher did not provide scoring rubrics. Whereas, scoring rubric is important as guidance for teachers to assess. It is in line with Nurjanah et al. (2019) she stated that scoring rubric could facilitate teachers in assessing by mapping students' skills based on competences to achieve. The average level of authentic assessment instrument arrangement from four schools was categorized excellent or high with average score 67.5%. Thus, it could be stated that the teachers were skillful to arrange the assessment.

All four school Biology teachers conducted affective aspect assessment by observing. The observations were done to see students' behaviors by using observational sheet. It consisted of checklist of students' attitudes, such as activeness, cooperation, and tolerance. Due to the rubric, it facilitated them to assess and map the students' skills based on their competences to achieve (Nujanah et al., 2019).

Table 2. Results of Context Evaluation Taken by Interview

Questions	SHS	Teachers' Answers
The most used assessment	A	Cognitive aspect assessed through daily test, midterm test, and final semester test. Affective aspect by class observation. Psychomotor aspect by practicum report.
	B	Cognitive aspect assessed by written and oral tests. Affective aspect assessed by observation with *"ClassDojo"* application and psychomotor aspect assessed while having practicum and practicum report.
	C	Cognitive aspect assessed through daily test, midterm test, and final semester test. Affective aspect by class observation. Psychomotor aspect by presentation discussion and practicum report.
	D	Cognitive aspect assessed by daily test, midterm test, final semester test, oral test, discussion, and presentation. Affective aspect by class observation.and psychomotor aspect by practicum report. And project.
Lesson Plan and assessment instrument arrangements.	A	Teachers used current lesson plan and instruments. Teachers did not arrange them for each lesson
	B	Teachers used lesson plan and assessment instruments made by professional teacher education program internship students.
	C	Teachers used existing lesson plan and assessment instruments.
	D	Teachers used existing lesson plan and instruments. Teachers were not able to make them for each learning.
Teachers provided tasks.	A	Teachers always provided question exercise before daily tests.
	B	Teachers did not frequently provide summarizing and *mind* mapping making tasks.
	C	Depending on the demanded competences Practicum reports as common tasks
	D	Directing students to complete the tasks at school.

Based on Table 2, the teachers were found to promote affective assessment by observing since it was more efficient and effective. It caused students did not know if their behaviors were assessed. Thus, they were not motivated to well behave and have well attitudes. If the teachers had done other affective assessments, such as conducting peer assessment or self-assessment, the students would have controlled their attitudes and behaviors. Thus, they would have been motivated to be better. It would have been positively influencing learning process. The use of *self-efficacy* and *peer assessment* could motivate them to be better in keeping up with the learning. Thus, their learning outcomes would improve (Yusuf, 2011; Karsidi et al., 2013). Those three techniques were collaborated to have positive influences on the students' learning outcomes. This statement is in line with Fitri et al. (2018) that the assessed collaborative skill could be done by observation, self-assessment, and peer assessment showed positive influences to students' cognitions.

The teachers assessed the students' cognitions by written tests on daily test, midterm test, and final semester test. SHS C and D teachers promoted learning by presentation discussion. It could activate students and their high order thinking skills to solve problems. Besides that, discussion and presentation could be media to train their skills in communicating. Skill is needed by students for their future lives. Discussion learning activity and presentation made students thinking, analyzing concept and delivering it, plus writing the discussion result and analyzing it (Naimnule et al., 2016).

The teachers assessed the students' psychomotor aspects through practicum, practicum report, and presentation discussion. Discussion makes students exchanging information and ideas to solve problems together (Naimnule et al., 2016). Through practicum, students could obtain science skill process, such as observing, interpreting, classifying, planning and educating, hypothesizing, questioning, and communicating (Suryaningsih, 2017).

Table 3. Results of Input Evaluation from Interview

Questions	SHS	Teachers' Answers
Teachers' experiences joining authentic assessment implementation training.	A	Unspecific authentic assessment implementation training
	B	There was authentic assessment implementation training from UNNES. It covered lesson plan arrangement, presentation, and teaching practice.
	C	The training was done in the beginning of authentic assessment implementation.
	D	Training was done during lesson teacher group discussion and not specifically discussing authentic assessment but instead whole learning.
Authentic assessment supervision	A	In academic year 2019/2020, supervision was conducted three times but it did not focus on authentic assessment.
	B	Supervision was done comprehensively twice in a year.
	C	Learning supervision was regularly done twice in a semester.
	D	Learning supervision was regularly done at least once in a year.
Problems in implementing authentic assessment.	A	Problems in implementing authentic assessment consisted of situation and condition which frequently were different to actual situation and condition. Thus, learning needed to be adjusted.
	B	Teachers could not memorize all students' names so it made them difficult to conduct assessment individually.
	C	The problems occurred on tests and tasks in which students' books were sometimes not named. Thus, it made the teachers having difficulties to input the scores.
	D	Teachers had difficulties to memorize all students' names which led to have difficulties in assessing each student one by one.

Based on Table 3, the teachers regularly obtained training from lesson teacher group discussion, minimally once in a year. The continuous training influenced positively to teachers' professionalisms (Rakib et al., 2016). Training for the teachers were intended to develop the teachers' skills and professionalisms (Gusseventini et al., 2017). The teachers' performance improvements could be done by training and educating them (Slameto et al., 2017).

Teachers were regularly supervised once in a year. Supervision was done to facilitate teachers' difficulties in planing, commencing, and reporting learning and the students' learning outcomes. Supervision was done individually by having class visit (Gusseventini et al., 2017). The teachers were supervised from their administrations, such as arranging lesson plan, teaching practice, and student learning outcome reports. It is in line with Gusseventini et al., (2017) that the assessed aspects in teacher performance are lesson plan made by teacher and the actual management in conducting learning.

The teachers' problems in implementing the assessment could be seen on Table 3. SHS B, C, and D teachers had difficulties to memorize all the students' names. Therefore, they had difficulties to input the students' scores. However, if it was seen during observation, the teachers did not do the assessment every day. They only wanted to finish the materials. The assessments should have been done on every learning or during learning process. So, teachers could notice the improvements of the students' skills and competences in every learning. What the teachers did was not in line with competence based assessment in which an assessment did not only assess product but also the process. Competence based assessment does not only assess the results bu the process (Nurjanah et al., 2019).

Table 4 Results of Process Evaluation of SHS A, B, C, and D

Public SHS	The Assessment Implementation Score Authentic on x^{th} meeting								Average*	Categories
	1	2	3	4	5	6	7	8		
A	0	0	0	0	2	0	0	0	0.25	Low
B	1	5	3	3	3	3	3	7	3.5	Moderate
C	3	7	5	5	7	3	0	0	3.75	Moderate
D	5	5	5	7	5	5	5	7	5.5	High
Total	9	17	13	15	17	11	8	14	3.25	Moderate

Remark: * Level of authentic assessment implementations 2.4% - 66.7% = moderate, implementation level > 66.7% = excellent/high.

Based on the data, the average of the assessment implementation from four schools was 3.25%. It indicated that the assessment implementation, on *process,* was categorized sufficient. The success of authentic assessment implementation could occur because of teachers' skills in designing and using the assessment. The findings found in SHS A showed that the teacher designed the assessment instruments well (See Table 1) but during its implementation, it was not as planned. The teachers at SHS B and D did not make affective assessment instrument. During observation, those two teachers did not promote affective assessment. The SHS D's teacher did affective assessment as realized into observation. The importance of affective score is about standard of 2013 curriculum implementation which is called as character based curriculum (Hariatiningsih, 2016).

SHS C's teachers did not make affective assessment instrument completely. The teachers assessed the affective aspect by observing the class. Affective assessment could be done not only by observing but also having sel-assessment and peer assessment. The use of self-efficacy and peer assessment could motivate students to be better and to keep up with the learning so they would have improving learning outcomes (Yusuf, 2011; Karsidi et al., 2013).

The actual found fact, in carrying out the learning, there were two schools - SHS A and B, which conventional method, such as lecturing. It was considered teacher - centered learning. The teachers explained the materials while the students listening. This activity may be done as long as the teacher modifies the learning. Conventional learning by lecturing could be done but it should be modified by other methods to make learning Biology joyful (Jayawardana, 2017). Teacher centered learning does not fit on 2013 curriculum learning which uses *scientific* approach. Scientific approach is done by using scientific method through direct learning concerning with facts and realities around student learning environment (Firman et al., 2018). Teachers could modify biology learning and authentic assessment based on students' characteristics at schools so it would influence their learning outcomes. It happened on SHS C and D. The teachers implemented *scientific* approach as indicated by student-centered learning. The learning was mostly done through discussion and presentation so students were habituated to solve problems, think creatively, and think in high order nature. Discussion trains students' thoughts while presentation trains their responsibilities, cooperations, and respects to other people's arguments (Solikhatun et al., 2015). Discussion and presentation train students to solve problems and express their already designed notions and ideas (Mitasari & Prasetyo, 2016). Discussion makes students exchanging information and ideas to solve problems together by thinking, analyzing concept then talk about the concept, and writing the results of discussion and analysis (Naimnule et al., 2016).

Biology teachers of those four schools assessed psychomotor aspects by having practicum and task for students to be reported. Through practicum, students could obtain science skill process, such as observing, interpreting, classifying, planning and educating, hypothesizing, questioning, and communicating (Suryaningsih, 2017). The practicum report task could maximize the students' activities and learning outcomes (Dewi et al., 2012). Thus, it could be concluded that the assessment done by SHS A, B, C, and D teachers had been met authentic assessment criteria although

the results were varied. The assessment was done by various methods and criteria, such as written test, presentation - discussion, and experiment which had met principles of authentic assessment (Hasyim et al., 2017).

Table 5. Results of Product Evaluation by analyzing the students' daily tests.

School	Class Average		Average School
	DT 1	DT 2	
A	54.88	47.75	51.315
B	68.44	75.69	72.065
C	72.11	55.71	63.91
D	71.94	75.83	73.885
Average per DT	66.8425	63.745	

Based on Table 5, it could be explained that the students' learning outcomes at SHS D obtained highest average. It was caused by student-centered learning. The teachers mostly promoted discussion and presentation so students could learn independently. Besides that, discussion and presentation could habituate students to think critically and solve problems. Discussion will habituate students to solve problems, answer question, increase understanding and knowledge, and to make decission (Naimnule et al., 2016). Problem solving skill could be measured by report assessment of problem solving, discussion, presentation of result and product (Haryani et al., 2017). The success of authentic assessment implementation at SHS D influenced the students' learning outcomes as seen on daily test. It was higher than other schools. It is in line with several previous studies explaining success of authentic assessment implementation which would improve learning outcome and skill of students (Majid & Ika, 2012; Fauziah et al., 2014; Alfian et al., 2015; Ma'ruf & Rahim, 2015).

The findings showed that SHS B obtained high average score, > 7.5 on second daily test. When it is seen from the implementation of SHS B's authentic assessment, it is categorized moderate (Table 4). Teachers incompletely applied the assessment while doing practicum. However, during classroom learning, the teacher did learn by providing *Higher Order Thinking Skills* questions. The researchers only found a Biology teacher at SHS B whom always provided HOTS questions. HOTS questions made students thinking higher and seeking alternative answers. The questions would habituate students to think highly when they are frequently given. Thus, they would influence cognitive and affective aspects of the students (Hugerat & Kortam, 2014). *Higher Order Thinking Skills* could result to higher thinking, creative thinking, and independent thinking skills (Husamah et al., 2018). Higher order thinking skills should be habituated for the students and should be managed well by teachers (Ramdiah et al., 2019).

Problems of authentic assessment experienced by teachers in conducting affective and psychomotor aspects concerning with requirements to observe and know each student. Besides that, teachers should memorize all students' names. Since there were many students, teachers felt difficult to memorize all of the names. This problem could be solved by *"ClassDojo"* application in which teacher could create a class and input the students' names. Teachers could input rubric and affective and psychomotor aspects to measure. As for example, student activeness, cooperation, tolerance during discussion, curiosity, and so on. By having rubric would facilitate teachers to assess and map students' skills based on competence to achieve (Nurjanah et al., 2019). This application is effective and practical to use. Thus, teachers would not always have to prepare instrument sheets. To use it, teachers only need to click and select aspects which match with student activity. Besides that, parents could also monitor students' behaviors since the application is connected among teacher, student, and parent. Thus, students could control their attitudes while joining learning activity. The application could connect teacher - parent communication. Thus, what and how students' behaviors which will be assessed could be known by students' parents (Robacker et al., 2018). According to Chiarelli et al. (2015), the use of "ClassDojo" application had positive influence on students' behaviors since students would get feedbacks upon their behaviors and they would be habituated to control their behaviors.

CONCLUSION

Based on data analysis, it could be concluded that authentic assessment implementation was varied. The authentic assessment instrument development of Public SHS A, B, C, and D's biology teachers in Semarang was generally

categorized excellent or high. All teachers had obtained 2013 curriculum learning training through Biology teacher discussion. The teachers were regularly supervised once in a year. The process of biology authentic assessment implementations at SHS A, B, C, and D in Semarang were categorized sufficient or moderate. The findings showed that SHS A student learning outcome average was 51; SHS B was 72; SHS C was 63; and SHS D was 73. The hindrances of the SHS A, B, C, and D's teachers in implementing the assessment dealt with cognitive, affective, and psychomotor aspects of the students simultaneously during each learning.

It is suggested for the teachers to be more skillful in using authentic assessment. When there is difficulty to assess affective and psychomotor aspects, students could use android by utilizing "ClassDojo". It is suggested for an institution to carry out more training for teachers to make them able to assess by using android. It is to facilitate teachers' jobs in promoting authentic assessment.

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