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Using Assessment As Learning With Active Feedback : Effect On Student Achievement

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Abstract

The use of assessment as learning is still less utilized in learning in schools, while evaluation as learning can stimulate students to reflect on their learning and take an active part in learning improvement. Assessment as Learning with active feedback, not only makes the student able to reflect on learning, but assessment as learning with this active feedback also enables the student to formulate a strategy for improving their learning with guidance, motivation, and advice from the Teacher and peers. Many studies have applied Assessment to Learning in various levels and fields of science. Therefore, this study aims to study the impact of applying assessment as learning with active feedback on high school physics material. This study is an experimental study with a Pretest-Postest Control design. Referring to the research results of the application of Assessment as Learning with Active Feed can significantly improve student performance. This study implies that the findings of this research will contribute to existing knowledge. It is important to know the impact of Assessment as Learning with active feedback on student learning performance.

Keywords: Assessment as learning, Active Feedback, Student Achievement.

Introduction

Assessment refers to the activities used by teachers and students to stimulate, shape, and measure learning (Ahmad, 2020; Black & Wiliam, 1998). In addition, evaluations are used to gather information about the progress of student learning outcomes. Assessment is also used to diagnose learning difficulties provide feedback and implement improvement policies in the learning process (Nargiza, 2021; Rosana et al., 2020). The use of Assessment as Learning contributes greatly to this. Assessment as Learning is an assessment that supports learning with a focus on reflection, where students can think about the state of their learning and think about improving their learning (Ghorbanpour et al., 2021; Rossini et al., 2019).

On Assessment as Learning students play a role in assessment. Students are involved in formulating assessment criteria, carrying out assessments, and monitoring and using support results to improve learning (Yang, Zi Yan, 2022; Yan & Boud, 2022; Lee, 2016). In Assessment as Learning, assessment is not only complementary to learning but offers a process in which student involvement in assessment can be displayed as part of learning. The role of the teacher here is to help students reflect on their learning and know how to improve their learning (Dann, 2014). Through the feedback that has been compiled, the teacher will be guided in carrying out the assessment and guide the student in implementing the reflection and improvement of

learning. Next with the presence of feedback that has been prepared, students will get motivation, and guidance and know their role in assessment activities.

Students engage in assessment through activities of searching, connecting, and using learning evidence such as determining assessment criteria, seeking feedback, reflection, etc (Yang, Zi Yan, 2022; Yan & Boud, 2022: Li, 2018). The involvement of students in assessment enables them to prepare themselves in the face of assessment and also know its advantages and weaknesses (reflection) (Ghorbanpour et al., 2021; Rosaini et al., 2019). This is in line with the function of Assessment as Learning, which helps students to actively think about the process and learning outcomes (Yang, Zi Yan, 2022; Yan & Boud, 2022; Earl & Katz, 2006). It is also in line with the goal of Assessment as Learning, which is to support learning with a focus on reflection (Yang, Zi Yan, 2022; Yan & Boud, 2022). Students can think about the state of their learning and think about their learning improvement strategies (Ghorbanpour et al., 2021). Assessment as Learning theoretically lies on the idea of self-learning and metacognition, to self-regulate or be motivated to carry out self-reflection (Lam, 2016; Earl & Katz, 2006). In this Assessment as Learning, students will be involved in preparation, assessment, and learning reflection.

Student involvement in this assessment will encourage an internal form of feedback for the student to take responsibility for improving his or her learning (Nicol, 2021). In addition, students will also get feedback from teachers and peer-to-peer friends (through peer evaluation), which will trigger internal feedback that regulates their learning (Lam, 2016). On Assessment as Learning students who critically and actively analyze and reflect on their learning progress to guide new learning (Earl & Katz, 2006).

Based on the survey results, the use of Assessment as Learning has not been maximized in learning. There are still many teachers/teachers who have not maximized Assessment As Learning in the process of learning improvement. There are still many teachers who only apply evaluation of learning and for learning. From the assessment of learning and applied learning, teachers will reflect and analyze what they have to do to improve learning. If Assessment as Learning has not been properly implemented, then educators cannot know, where learning improvement is more effective by involving students. This research offers the application of Assessment as Learning. It will be able to contribute to the improvement of learning by developing the quality of learning, through student self-reflection in Assessment as Learning with active feedback.

Based on previous research, it is known that Assessment as learning through self-assessment is effective in increasing student awareness in improving their learning. In literature, Assessment as Learning is an assessment involving students in the improvement of learning, through the reflection of their learning (Yang, Zi Yan, 2022; Li, 2018; Lee, 2016; Ghorbanpour et al., 2021). The application of Assessment as Learning can make students aware of their weaknesses and strengths in learning and will encourage them to develop strategies for improving education (Yan & Boud, 2022; Leahy et al., 2005). Assessment as learning is an approach that is highly expected to be applied in learning.

In this study, the applied Assessment as Learning is assessment as Learning with active feedback. Feedback is an effective assessment activity to make the participants aware of the improvement of their teaching (Leahy et al., 2005; Heritage, 2010; Hearn & McMillan, 2008). Active feedback is information that a teacher should pass on to a

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student to encourage the student to improve his or her learning (Wiyaka et al., 2020). Assessment as Learning and active feedback provides significant benefits in improving the quality of learning through self-reflection. This research aims to demonstrate the effectiveness of the application of Assessment as Learning with active feedback on student learning outcomes. This research can provide scientific and related literature contributions on the impact of Assessment as Learning with active feedback on student learning outcomes and the correct application of Assessor as Learning in learning.

Research Methods

Design of research

This research is quantitative. This research method uses a quasi-experimental pre-test and post-test with a control-experiential group design design. According to (Gopalan et al., 2020), pre-tests and post-tests are perfectly designed to demonstrate the effectiveness of assessments. This assessment is used accurately to describe causal and effect relationships between variables when groups are randomly assigned and one group is given treatment (Gopalan et al., 2020; Campbell, D. T., & Stanley, 1963; Sirotová et al., 2021). The sample in this study is Class XI IPA, from SMAN 1 Merangin and SMAN 6 Merangin. The sample consists of two classes, the experiment class, and the control class. In this study, the determination of the experimental class and the control class is carried out by voting after all populations in the homogeneity test. The results showed that Class XI IPA 1 SMAN 1 Merang was a control class and Class XI IP 4 was an experimental class. In SMAN 6 Merangin, class XI IPA 4 is a control class, and class XI IPA 3 is an experimental class

Procedure

The study was conducted in 2023, for six weeks. In this study, the experimental class applied Assessment as Learning with active feedback, and the control class did not apply assessment as Learning. The study design diagram is shown in Table 1.

Table 1. Design of research.

Class	Pre-test	treatment	Post-Test
Experiment	0_1	T	0_2
Control	0_1	-	0_2

Description: 0 = pre-test and post-test; T = Treatment Assessment as Learning

Assessment as Learning with active feedback has ten elements or activities. This activity is formulated based on effective formative assessment activities expressed by (Leahy et al., 2005; Heritage, 2010; Hearn & McMillan, 2008). These 10 activities are:

It consists of 10 components.

1. Explain the purpose of learning and motivation for success.
   In Assessment as Learning activities, teachers focus students on learning materials by communicating learning goals as well as giving directions or reading stories to motivate students in learning.
2. Identification of fundamental questions and effective learning tasks.
   At this stage, the teacher asks a video and formulates questions that direct the student on the project tasks to be implemented.

3. Assessment and assessment criteria.
   At this stage, teachers together with students discuss formulating or agreeing on the criteria and evaluation rubrics.
4. Students as owners of their own (self-assessment).
   At this stage, the teacher asks the student to carry out a self-assessment, according to the already planned instruments.
5. Activating students as a resource for each other (peer assessment).
   At this stage, the teacher asks the student to evaluate his classmates, according to the instruments already planned.
6. Getting proof of learning (Self-assessment, peer, performance, and written).
   At this stage, teachers carry out student performance assessments at the time of implementation of the project, carry out project assessments, by asking students to present their project reports as well as carry out self-assessments, peers, written, performance, and project.
7. Activation of students to identify learning gaps.
   At this stage, teachers ask students to reflect on their learning, identifying their gaps and inactivity in learning.
8. Give feedback that moves students.
   At the time of carrying out the written assessment, the teacher writes the correct answers, writes instructions and motivation sentences for learning improvement, during the evaluation of the project and performance the teacher verbally comments on the performance and reports of the student's project and gives instructions for improvement.
9. Adapt and respond to learning needs.
   Ask students to identify their shortcomings and advantages in learning, as well as think of the advice of teachers for improvement solutions.
10. is to Encourage new learning and close gaps Ask students to formulate their shortcomings or weaknesses in the learning process point out improvement solutions and implement such improvement strategies in learning.

In each learning activity, learning activities are divided into three activities, namely: 1) Initial activity, 2) Core activity, and 3) Closing activity. In the preliminary activities, the teacher explains to the student the purpose of the lesson and the tasks to be completed. Then on the core activities, the teacher focuses the student on the underlying questions of the task, carries out assessments (self-assessment, peers, writing, and performance), and provides motivation and guidance for formulating learning improvement strategies. At the closing activities, students are allowed to conclude the finished materials studied as well as motivated to further improvement of learning.

The research instrument

The instrument used at the time of the pre-test and post-test to evaluate the learning outcomes on the cognitive aspects of students is an essay test sheet. The post-test is carried out after the student has completed the project tasks for six weeks. Before using the instrument, the instrument is validated and determined reliability. The validity and reliability of instruments were analyzed using Pearson Product Moment and

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Cronbach's alpha. The test instrument has 18 essays. After the validity test, eight questions were declared valid and 10 questions were considered invalid. The invalid question is no longer used because the invalid question does not match any indicator, which means that each indicator is still represented by more than one question. After a reliability test has been carried out, the instrument has a reliability coefficient of 0.770, so the instrument is reliable.

Techniques of Data Analysis

Quantitative and inferential descriptive statistics are the methods used in analyzing data Processing data for this research is done using SPSS version 26. Categorical data is described using frequencies and percentages, Averages, standard deviations, and ranges are used to describe continuous data. The normality test of Shapiro Wilk (Rani Das, 2016) which measured the central tendency of kurtosis and the skewness coefficient was carried out to ensure that the data obtained from both classes followed the normal distribution. The Levine test was performed to ensure that the data obtained from both classes had the same variance (Field, 2017). After testing and the data obtained averages are not distributed normally and their variations, then to analyze the data is decided to use non-parametric. Where the test to be carried out to analyze the data on this study is Wilxoson and to know the impact of the application of Assessment as Learning on student performance, perform NGain test.

Results and Discussion

The study involved 126 students. Each of these students consists of 63 students from SMAN 1 Merangin and 63 students from SMAN 6. Students are divided into 33 students each for the experimental class and 30 students for the control class. In this survey, before carrying out the learning students either in the control class or in the experiment class are evaluated through a pre-test. After carrying out the study of students in the evaluation through the post-test, the results of the pre-test and post-test evaluation are shown in Table 2.

Table 2. Skor statistif deskriptif

		Control Class Pretest SMAN 1 Merangin	Control Class Postest SMAN 1 Merangin	Experiment Class Pretest SMAN 1 Merangin	Experiment Class Postest SMAN 1 Merangin	Control Class Pretest SMAN 6 Merangin	Control Class Postest SMAN 6 Merangin	Experiment Class Pretest SMAN 6 Merangin	Experiment Class Postest SMAN 6 Merangin
N	Valid	30	30	33	33	30	30	33	33
	Missing	3	3	0	0	3	3	0	0
Mean		51.237	58.3333	52.2455	77.1785	55.584	58.3333	55.8155	81.6442
Std. Deviation		2.08963	5.7735	2.54181	5.48379	2.12244	5.7735	2.42118	3.15595

Referring to Table 2, see student achievements in SMAN 1 Merangin, in the Control class and the Experiment class. Average student scores in the control class are obtained, the Pretest score is 51, 23; post-test scores are 58,33. Students in the

experimental group obtained a pre-test average score of 52.24; the post-test score was 77, 17. Student achievements in SMAN 6 Merangin, in the Control class obtained an average pretest score, of 55.58. The average score for the post-test was 55.81. In the experiment class, the average student score on the pre-test was 55.81 and the average score for the post-test was 81.64. Before a statistical test is carried out to see the effectiveness of the use of Assessment as Learning, a pre-conditional test of normality and homogeneity test is first performed. Normality and homogeneity tests are performed to determine what tests will be used. (uji parametric atau uji non parametric). The normality test results are shown in Table 3.

Table 3. Test Of normality

Class		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
HASIL	Control Class SMAN 1 Merangin	0.235	60	0.000	0.886	60	0.000
	Experiment Class SMAN 1 Merangin	0.247	66	0.000	0.859	66	0.000
	Control Class SMAN 6 Merangin	0.129	60	0.015	0.912	60	0.000
	Experiment Class SMAN 6 Merangin	0.269	66	0.000	0.813	66	0.000

The normal distribution of data is tested using the Shapiro-Wilk test. The Wilk Shapiro test was selected because the research sample of each class was less than 50. Hasil uji normalitas pada masing masing kelas didapat sig 0,000, lebih kecil dari 0,05. From the normality test results, it was concluded that the data was not distributed normally. Since the data does not differ from normal, the following statistical test used is non-parametric. Before the statistical test, a homogeneity test is carried out. The homogeneity test results are shown in Table 4 and Table 5.

Table 4. Homogeneity test of SMAN 1 Merangin

		Levene Statistic	df1	df2	Sig.
Results	Based on mean	0.758	1	61	0.387
	Based on median	0.378	1	61	0.541
	Based on the median and with adjusted df	0.378	1	56.695	0.541
	Based on trimmed mean	0.695	1	61	0.408

Referring to Table 4, it is seen that sig 0.387 is larger than 0.05. Thus it can be concluded that the control class and the experiment class on SMAN 1 are homogeneous. To find out the homogeneity of the sample on SMAN 6 Merangin, present in Table 5.

Table 5. Homogeneity test of SMAN 6 Merangin

		Levene Statistic	df1	df2	Sig.
Results	Based on Mean	0.683	1	61	0.412
	Based on Median	0.147	1	61	0.703

	Based on the Median and with adjusted df	0.147	1	57.312	0.703
	Based on trimmed mean	0.492	1	61	0.486

Referring to Table 5, it is seen that sig 0.412 is greater than 0.05. Thus it can be concluded that the control class and the experimental class on the SMAN 6 Merangin are homogeneous. From the homogeneity test results of the pre-test using the Levene test, in the control class and the experiment, it was found that the two groups of classes were homogenous. Based on the normality test in which the data is not distributed Normally, and the homogeneity test of the data Homogen, then the test to be performed is a non-parametric test using the Wilcoxon test. The results of the Wilxoco test are shown in Table 6 and Table 7.

Table 6. Wilcoxon test results at SMAN 1 Merangin

	Posttest Class Control SMAN 1 Merangin - Pretest Class Control SMAN 1 Merangin	Posttest Class Experiment SMAN 1 Merangin - Pretest Class Experiment SMAN 1 Merangin
Z	-4.227[b]	-5.012[b]
Asymp. Sig. (2-tailed)	0.000	0.000

Table 7. Wilcoxon test results for SMAN 6 Merangin

	Posttest Class Control SMAN 6 Merangin - Pretest Class Control SMAN 6 Merangin	Posttest Class Experiment SMAN 6 Merangin - Pretest Class Experiment SMAN 6 Merangin
Z	-2.026[b]	-5.012[b]
Asymp. Sig. (2-tailed)	0.043	0.000

Referring from Table 7, it is seen in the Wilcoxom test obtained by Sig (2-tailed) of 0,000, smaller than 0,05 so it can be concluded that there is an impact of the application of Assessment as Learning with active feedback on student performance in SMAN 1 Merangin. Wilcoxon test results for SMAN 6 Merangin obtained in Sig. (2-tailed) of 0,000 smaller than 0.05, thus there is an impact of the application of Assessment as Learning with active feedback on student performance in SMAN 6. To see how much impact the application of Assessment as Learning with active feedback on student performance has, an NGain Scor test is carried out. The results of the Ngain score test are shown in Table 8 and Table 9.

Table 8. NGain score for SMAN 1 Merangin

	CLASS	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_Scor	Control	30	64.11	43.93	57.2791	5.78993
	Eksperiment	33	68.02	85.66	76.0789	5.4646

Table 9. N Gain Score for SMAN 6 Merangin

	CLASS	N	Minimum	Maximum	Mean	Std. Deviation

Ngain_Scor	Control	30	25.83	28.26	5.8566	14.61201
	Eksperiment	33	48.35	73.75	58.5868	5.93754

In Table 8 and Table 9, we see NGain values for two groups of samples, namely control and experimental classes of SMAN 1 Merangin and SMAN 6 Merangin. In Tables 8 and 9, it is seen that the Mean difference between the experimental class and the control class is quite distant, where the mean class of the experiment is greater than the control Class. The NGain scoring results showed that the application of Assessment as Learning with feedback has an impact on student learning performance.

Based on the results of the comparison of students' post-test values in general, it can be concluded that the student's performance in the experimental class increased significantly in SMAN 1 Merangin and also SMAN 6. In addition, the Wilcoxon test results also confirm the statement that there are significant differences between the experimental class and the control class. From NGain test results for the experimental class in SMAN 1 Merangin, has been obtained has meanya 76.0789, with NGain category effective. The NGain value of the experimental class for SMAN 6 Merangin was obtained at 58,5868 with a fairly effective category. The results of this NGain test prove that the application of Assessment as Learning has a significant impact on student achievements. This is due to Assessment as Learning, which is an assessment that wants students to be able to improve their learning. Students formulate their learning strategy based on self-reflection, advice, motivation, and guidance from teachers and peers (Yang, Zi Yan, 2022; Yan & Boud, 2022; Lee, 2016; Dann, 2014; Lam, 2016). In addition, the student is also monitored by the teacher in repairing his pupils.

In this study, the experimental class showed better learning performance than the control class. The experimental class applies Assessment as Learning with active feedback, while the control class does not apply assessment as Learning with active feedback. The results of the study are consistent with the opinions of Earl (Earl & Katz, 2006) that reveal students who critically and actively analyze and reflect on their learning progress to guide new learning. Opinion Leahy, Haritage, Hearn &Mc Milan, that effective formative assessment strategies will bring major changes to learning outcomes (Leahy et al., 2005; Heritage, 2010; Hearn & McMillan, 2008). In this study there are 10 activities and feedback that are applied in Assessment as Learning that explain the purpose of learning and motivation for success, in this activity, teachers explain the learning goals and build the motivation of students to be interested in learning. The following activities are the determination of basic questions and effective learning tasks, these activities are carried out so that the participants are focused on the tasks that will be implemented. The next activity applied in Assessment as Learning is the formulation of assessment and assessment criteria, here students are involved in formulating the aspects that will be evaluated and how they will be in value. Assessment formulation activities and assessment criteria are feedback for students for the preparation of the assessment to be carried out so that students can prepare themselves. It is the opinion of Dowson, Dini, and Heritage that student engagement is implemented in the assessment process, which can facilitate, and provide feedback to students to reflect and take responsibility for improving their learning (Dawson et al., 2021; Dini, 2018; Heritage, 2010),.

Following are self-determination and friendship. Assessment of oneself and peers is an activity of assessing self-performance and also friends. On self-assessment and with peers, Students are required to reflect on their learning and formulate their graduate improvement strategies. Self-assessment is an assessment that requires students to assess themselves with the status, process, and level of achievement of learning competence (Heritage, 2010; Hanrahan & Isaacs, 2001). Andrade reveals self-assessment as a formative assessment process in which students reflect on the quality of their work, compare that quality of performance with the criteria already established, and improve their learning (Andrade, 2019). With the evaluation of peer-to-peer friends, students obtain information about their competence so that they are motivated to improve them (Leahy et al., 2005; Heritage, 2010; Hearn & McMillan, 2008). In addition to that another benefit of peer assessment is being able to train students to have a sense of responsibility, and cooperation in peer learning in groups (Leahy et al., 2005). These self and peer assessments provide students with information about their learning strengths and weaknesses. Self-assessment and peer assessment also give students advice and motivation to improve their learning. Self-reflection and advice received by students is a way to carry out activities to identify learning gaps. From the identification of known learning gaps, the teacher gives feedback to the student. Feedback is given by teachers, who advise on learning improvement strategies, give motivation records and justification of answers on evaluation sheets as well and guide students to implement strategies for improving learning. In addition to self-assessment on Assessment as Learning with this feedback, students also value their performance, from preparation, and process to the end of learning. In the implementation of learning, teachers will monitor the application of learning improvement statics and continue to encourage students to identify their weaknesses in learning and formulate the improvement of learning statics

Based on the results of monitoring in research, the effective feedback applied in this Assessment as Learning makes students active in learning activities. Assessment as Learning with this active feedback makes students always get motivation and help in their learning. Assessment as Learning also enables students to prepare themselves in the face of assessment (Ghorbanpour et al., 2021; Rosaini et al., 2019). They are involved in the preparation of assessment and depreciation criteria. Further with Assessment as Learning with this active feedback, students can realize their mistakes in learning and get advice and motivation for improving their learning.

In developing achievements (student understanding and knowledge), the application of Assessment as Learning with active feedback is a valuable strategy to implement, because assessment as Learning can grow student awareness of their learning, and able to stimulate students to improve their learning. This assessment as learning needs to be applied by the teacher in learning because this Assessment as Learning is an assessment that includes formative and summative. This assessment evaluates students at each learning stage and students are involved in learning improvements.

Conclusion

Learning by applying Local Wisdom Project-Based assessment learning has a significant impact on students' HOTS (Problem Solving, Critical Thinking, Creative

Thinking). This happens because learning by applying assessment as learning based on local wisdom projects gives opportunities for students to be directly involved in learning and assessment. Learners are guided to reflect on their learning, knowing their strengths and weaknesses in learning. Furthermore, students are directed to think about looking for strategies to improve their learning, so that students can construct their learning at a later stage. In addition, with the local wisdom project in the learning process, students become directly involved in associating the culture of everyday life with the learning material they are studying. This will enable students to develop their prior knowledge and encourage students to respond and think to find solutions to the problems they solve to improve their thinking skills.

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