



European Journal of Educational Research

Volume 13, Issue 2, 445 - 456.

ISSN: 2165-8714

<http://www.eu-jer.com/>

Vocational High School Students' Perception of Assessments in Online Learning: For, As, and Of Learning

Edy Supriyadi 

Universitas Negeri Yogyakarta,
INDONESIA

Nur Kholis* 

Universitas Negeri Yogyakarta,
INDONESIA

Haryanto 

Universitas Negeri Yogyakarta,
INDONESIA

Samsul Hadi 

Universitas Negeri Yogyakarta,
INDONESIA

Received: May 27, 2023 ▪ Revised: July 6, 2023 ▪ Accepted: August 9, 2023

Abstract: Implementing online learning has led to several issues, especially those related on assessments to measure students' learning achievement. This study aimed to obtain accurate information on learning assessments for vocational high school (VHS) students during online learning, including assessment for learning (AFL), assessment as learning (AaL), and assessment of learning (AoL). It also investigated students' perceptions of the assessments based on their grades. This quantitative research employed the survey method, collecting data through questionnaires. The population of this research is VHS students in Indonesia, totaling 86,885 students. The participants of this study were 487 VHS students. The data were analyzed using descriptive and ANOVA techniques. The results show that most VHS students positively perceive the assessment of learning achievements in online learning for AFL, AaL, and AoL aspects. Moreover, there is a significant difference in students' perceptions of the assessment in online learning based on grades. The perception of class XII students is the highest (average value = 3.90) of all classes, while the other classes have an average value of 3.38 for class XI, and the average value of class X is 3.81.

Keywords: *Assessment, online learning, vocational high school.*

To cite this article: Supriyadi, E., Kholis, N., Haryanto, & Hadi, S. (2024). Vocational high school students' perception of assessments in online learning: For, as, and of learning. *European Journal of Educational Research*, 13(2), 445-456. <https://doi.org/10.12973/eu-jer.13.2.445>

Introduction

Vocational high school (VHS) is a formal secondary-level academic institution that prepares graduates to compete in the working world and develop future careers. VHS strongly emphasizes the practical learning experience. It requires students to participate in an internship program in industries. The vocational education model is designed to provide direct access to jobs or be a step toward higher education (Denmark Ministry of Education, 2014). Modern vocational education allows people to learn highly transferable creativity and skill development, practical skills, and specific activities for chosen job roles (Directorate-General for Employment, Social Affairs and Inclusion, 2018).

VHS graduates are expected to get jobs easily according to their field of competence. However, the highest number of unemployed in Indonesia comes from VHS graduates. The Central Statistics Agency reported that the open unemployment rate in August 2020, February 2021, and August 2021 still had the same pattern. Many VHS graduates are still unemployed (Putri, 2021). This could be caused by the curriculum, learning, and assessment that differ from what they should be (LaRocque, 2015). The competencies of VHS need to follow the competencies demanded by the labor market.

According to (Wiliam, 2013), learning outcomes indicate learning success. The reciprocal influence between learning and assessment is the evidence of learning outcome improvements. The learning process is assessed based on existing regulations, while the assessment results become an overview of the student's learning results. Then, the merits of a learning process can be seen from students' learning results. Assessment has been a crucial part of the learning process. A good assessment will determine the teaching quality (Jimaa, 2011). Assessment includes formative and summative modes during the learning process. It is to determine the extent to which students can grasp the materials. Teachers review this input to enhance learning activities. Teachers conduct assessments based on their experiences or common practice rather than referring to previous studies or grand theories.

* Corresponding author:

Nur Kholis, Universitas Negeri Yogyakarta, Indonesia. ✉ nurkholisnkh@uny.ac.id



Three approaches to learning assessment have been widely recognized, namely assessment of learning (AoL), assessment for learning (AfL), and assessment as learning (AaL). The AoL approach is an activity carried out to collect evidence at the end of learning, which aims to assess student achievement based on learning objectives and benchmarks that students must meet. In other words, this approach is used to provide a summative assessment of student performance. The functions of this AoL approach are (i) to measure learning outcomes, (ii) to examine student learning progress against predetermined benchmarks, (iii) to rank students based on their performance, (iv) to make summative decisions, (v) to provide data as the basis for long-term learning planning, (vi) to provide the certification (Ade-Ojo & Duckworth, 2020).

The AfL approach gathers information during learning to decide what actions are needed to help improve teaching and learning. The function of this approach is (i) to understand how students learn by monitoring their progress during the learning process, (ii) to make learning decisions using information that is collected continuously, and (iii) to improve student learning through providing quality feedback (Berry, 2008).

The AaL approach allows students to gather information about their learning. Furthermore, based on the data, students reflect on their learning and plan improvement. The function of this approach is (i) to help students understand the minimum expected limits of their performance, (ii) to assist students in developing their ability to monitor, assess, and evaluate themselves, and self-correct, (iv) to assist students in developing their lesson plans (Berry, 2008).

According to the study conducted by Mukhtar and Ahmad (2015), AfL helps students develop their cognitive, affective, and psychomotor capacities following the demands of the National Education Philosophy. No longer are students evaluated at the end of the school year or each lesson. As an alternative way, they are assessed while they learn. The use of AfL in vocational-technical education can help students become more aware of their obligation to learn. It highlights the students' success potential and motivates them to be independent learners. Teachers have different perspectives on developing evaluation because only a few principles can be used as a good reference throughout implementation (Sugiyono et al., 2018). It implies that the best way to implement assessment needs to be clarified. Teachers can choose how to assess their students by modifying their qualities. The learning objectives should align with various assessment methods (Montenegro & Jankowski, 2017).

An overview of research results related to implementing learning outcomes assessment in face-to-face learning (Before the Covid-19 Pandemic) in Schools is as follows. Formative assessment is practical and helpful in increasing student competency (Trismayanti, 2021). In addition, teachers and students have a positive attitude towards using formative assessment as a medium for competency development. The application of feedback in formative assessment positively impacts students' learning process activity (Nahadi et al., 2015). Students become more enthusiastic, motivated, and active in the learning process. The feedback result of Parsa's research (2015) shows that the application of formative assessment has a significant effect on significantly affect national students' entrepreneurship practices.

Subehi and Sriyanto's (2021) research results show that implementing assessments for learning in schools is quite good. The results of a study on the implementation of assessment in vocational high schools by Supriyadi (2019) showed that, in general, the implementation of assessment in face-to-face learning is going well, although there are still several obstacles. Meanwhile, the findings of the study by Mahdiansyah (2018) revealed that the assessment of learning outcomes carried out by teachers, education units, and the Government has yet to be carried out optimally to improve the quality of learning. Meanwhile, teacher's competence in conducting assessments still needs to be improved.

Based on the results of research on assessment at VHS, it can be emphasized that the assessment of learning outcomes in face-to-face learning (before Covid-19) was generally quite good, although there were still some weaknesses.

The COVID-19 outbreak in recent years has dramatically impacted learning processes, especially the limited interaction and communication between students and teachers. If students are not used to online learning, teachers should be encouraged to believe that online learning can be beneficial to overcome the problems of conducting in-person learning during the pandemic (Salleh et al., 2022). During the COVID-19 pandemic, assessing learning outcomes was an essential factor that needed more serious attention. However, the role in improving the quality of vocational graduates is very crucial. Assessment has been an integral part of learning in theoretical and practical subjects. Systematic assessments, particularly formative assessments, are constructive for teachers and students to examine the extent to which the learning objectives have been achieved. It indicates the materials that students have mastered and those that have not. This information will be valuable input for teachers to enhance learning activities. Additionally, the students will know what topics require more to be improved. It will help the students to promote their creative thoughts and dynamic idea engagements.

School-based assessment (SBA) is attracting much more attention. SBA has always been a vital element in the teaching and learning process. Recent studies explored the benefits of the shift to e-learning and online assessment as a promising strategy after the World Health Organization (WHO) declared the COVID-19 outbreak (Elzainy et al., 2020). The success of the digital learning environment is evaluated based on student and staff satisfaction, achievement, and development of technological literacy. Online learning can be carried out through distance and blended learning. Conducting learning using both modes via mobile apps has advantages and disadvantages.

The threat of the COVID-19 and other virus outbreaks still haunts us, and it needs to be anticipated, especially in education, where classes mainly require face-to-face interaction and VHS emphasizes practical activities. Moreover, the demands of Industrial Revolution 4.0 and subsequent developments urge integrating information communication technology (ICT) in education. As the millennial generation, VHS students are used to communicating or exploring information through the internet and social media. It means that online learning and its assessment of school learning outcomes should be comprehensively designed. Assessment in online learning during the COVID-19 pandemic is relatively new platform for teachers and students. There needs to be adequate preparation for this process because, during the COVID-19 pandemic, many parties faced various obstacles. Therefore, how to conduct online learning assessments in VHS needs to be clearly defined, mainly based on the students' perceptions as the main focus of learning.

When the COVID-19 pandemic is over and resolved, online assessment is still very much needed, entirely online and blended. This is also due to the support of information and communication technology advances so that online assessments can be carried out efficiently and effectively. The central government and local governments support online learning and assessment by issuing online learning and assessment regulations, including for VHS (Ministry of Education and Culture, 2020). Online assessments have also been carried out widely, including for competency tests, the election of new students, the selection of civil servants, and others (Khairil & Mokshein, 2018; Ruhana, 2018).

Online learning is a teaching and learning process that uses the internet and digital media to deliver materials. Teachers can implement online learning in a synchronous or asynchronous environment. Students can be anywhere to learn and interact with teachers and other students (Singh & Thurman, 2019). The synchronous learning environment is structured in the sense that students attend lectures in real-time interactions with teachers. It is possible to have direct feedback through this environment, while asynchronous learning is not providing any (Dhawan, 2020). In addition to the usefulness and efficiency of e-learning systems, it is essential to create learning materials with audio, video clips, animations, and hyperlinks. A rich multimedia design of e-learning materials will increase students' intention to use it and generate more positive attitudes (Jović et al., 2017).

Teachers need a high level of preparedness to quickly adapt to the changes in the environment and adjust to different delivery modes, such as online learning. The teacher can adequately organize hybrid or entirely online learning if the facilities are sufficient. When students enjoy online learning, the outcomes can be achieved optimally. Moreover, online learning can still be appropriately held though the pandemic has ended (Schellekens et al., 2021). The utilization of various media, such as virtual courses with Google Classroom, Schoology services, and social media sites like Facebook and Instagram, can promote the implementation of online learning (Iftakhar, 2016; Sicat, 2015). Even when teachers are geographically distant, online learning links students to many learning tools. They may directly or indirectly engage, communicate, and work together.

The COVID-19 pandemic demands that teachers measure students' learning achievement through online platforms. Online technology is applied to assess learning outcomes, including AfL, AaL, and AoL. Online tests give teachers creative freedom to develop materials for each course. Students may also take the tests whenever it is the most convenient for them. Online tests also let students communicate and work with their classmates through group projects, self- and peer reviews, and online forums. Such evaluations give students a thorough learning record that they can use to highlight their accomplishments once they have graduated from college (Ragupathi, 2020).

Since the outbreak of the COVID-19 pandemic, the Indonesian government issued new policies related to learning and assessment, including national exams (Ministry of Education and Culture, 2020). Starting in 2020, the national exam will be abolished and replaced with the national assessment (NA). Under this policy, the learning and assessment conducted by VHS has changed. Learning is directed at material according to competencies that students must master according to the applicable curriculum. Assessment of learning outcomes leads to authentic assessments, including AfL, Aas, and AoL proportionally. The Ministry of Education and Culture organizes training to improve teacher's competency in learning and assessment. The training material is more on face-to-face learning and assessment. More training materials on online learning and assessment were provided.

VHS must carry out online learning and assessment by school conditions. To organize online learning and assessment, VHS needed adequate communication technology tools and sufficient experience in conducting online learning and assessment. Student satisfaction with online learning is significantly affected by how the course is organized and how the content is sequenced, the ease with which students can complete assignments, and the use of the LMS to engage with content (Xu & Mahenthiran, 2016). Therefore, it is necessary to conduct research related to the implementation of assessment in online learning at VHS, which includes AoL, AaL, and AoL.

Online assessments offer many advantages, such as simple administration, automated marking, less paperwork, instant feedback on learners' progress, direct monitoring of students' performance, etc. However, it needs more preparation time. Online assessment is a technology-based system that is incurring huge costs. Some institutes face many obstacles in providing adequate facilities and stable internet access. This study answered the following research questions: (a) what is the perception of the VHS students toward Assessment for Learning in online learning? (b) what is the perception of the VHS students toward Assessment as Learning in online learning? (c) what is the VHS students' perception of

Assessment of Learning in online learning? (d) is there a difference in the perception of vocational students toward assessment in online learning?

Methodology

This quantitative research employed the survey method, collecting data through questionnaires. The study participants were VHS students with a population size of $N=86\ 885$ from VHS in Indonesia. Based on (Krejcie & Morgan's, 1970) sample size table, the minimum number of respondents was 384. The sampling technique in this study used a random cluster sampling technique. To anticipate some respondents' low eligible return to the questionnaire, 500 online questionnaires were distributed. Four hundred eighty-seven (487) valid questionnaires were then analyzed with a 92.76% response rate.

The online questionnaire consists of three parts: (a) VHS students' perception of AfL, (b) VHS students' perception of AaL, and (c) VHS students' perception of the AoL. Each part consists of several components. The AfL consists of three components: assessing, diagnosing, and remediating. The AaL includes three components: monitoring their learning, asking questions, and using various strategies. The AaL process includes four steps: learning standards, measuring instruments, testing grading and feedback, and reporting. Based on the instrument grid, and expert validation, a questionnaire of 44 items was successfully developed. Students are as data sources targeted by using this questionnaire are students. A 5-point Likert scale that was used to grade each of the items in parts A, B, and C are Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1). Three experts validated the online questionnaire, and the instrument's reliability ($\alpha = .96$) was measured using the Cronbach Alpha coefficient.

The data were analyzed using descriptive and ANOVA techniques. The SPSS version 26 was used to analyze the data from the questionnaire. Five classifications or categories were used to interpret the mean values in this study into Excellent (4.21-5.00), Good (3.41- 4.20), Fair (2.61-3.40), Poor (1.81-2.60), and Bad (1.00-1.80).

Findings/Results

VHS Students' Perception of the Assessment for Learning in Online Learning

AfL consists of three main components, i.e., assessing, diagnosing, and remediating.

Table 1. Students' Perception of the Assessment for Learning

No.	Aspects/Items	M	SD	Classification
	Assessing			
1.	Teachers inform the learning stages, including asking and answering sessions	3.53	0.81	Good
2.	Teachers present verbal questions (Quizzes) related to the discussed materials	3.50	0.81	Good
3.	Teachers give exercises for students to work on	3.62	0.88	Good
4.	Teachers give feedback on students' works	3.43	0.85	Good
	Diagnosing			
5.	Teachers give opportunities to ask questions.	3.77	0.89	Good
6.	Teachers re-explain the materials that 'have not been Mastered by students	3.56	0.80	Good
	Remediating			
7.	The remedies are carried out for the students getting the result below the target	3.78	0.81	Good
8.	Enrichment is conducted among students getting the result above the target	3.42	0.89	Good
9.	Teachers ask students' opinions on the applied learning strategy/assessment	3.47	0.84	Good
	Assessment for Learning	3.57	0.67	Good

Based on Table 1, AfL obtained a value of $M=3.57$, classified as a good category. Two items get the highest scores. These items are Item number 5: "Teacher gives opportunities for students to ask questions related to material that has not been understood" with a value of $M=3.77$, and Item number 7: "Remedies are carried out for students who get the learning results below the target" with a value of $M=3.78$. Based on the assessment results, it can be confirmed that students agree that the Assessment for Learning has been carried out appropriately.

For several items in AfL, the remediating component obtained the lowest scores, i.e., Item number 4: "Teachers give feedback on students' works" with a value of $M=3.43$, Item number 8: "Enrichment is conducted among students who get the results above the target" with a value of $M=3.42$, and Item number 9 "The teachers ask students' opinions on the applied learning strategies/assessment" with the value of $M=3.57$. Although the three items were classified as a suitable category, the average value was the lowest. It indicates that the Assessment for Learning should be improved.

VHS Students' Perception of the Assessment as Learning in Online Learning

Table 2 contains the aspects measured for Assessment as Learning. The mean value obtained is 3.52 (good category). Based on these data, this study concluded that the Assessment as Learning was carried out correctly. Item 10, "Based on the assessment results, I need to study harder to obtain better results," gets the highest mean value ($M=3.75$).

Two items that obtained the lowest score are Item number 5: "During the lesson, I ask the teacher questions on material that I did not understand yet" ($M=3.26$), and Item number 6: We discuss several question items in a group ($M=3.40$). These two items are students' activities that must be effectively performed because they lead to mastery of the subject matter. Those items are in the Uncertain category and must be improved.

Table 2. Students' Perception of the Assessment as Learning

No.	Aspects/Items	M	SD	Classification
<i>Monitoring their learning</i>				
1.	Teachers explain lesson & assessment plan	3.51	0.92	Good
2.	Based on the plan, I understand what material I need to learn more	3.55	0.78	Good
3.	The assignments and assessments help me to monitor my learning progress	3.53	0.84	Good
4.	Teachers' feedback helps my learning process	3.60	0.76	Good
<i>Asking Question</i>				
5.	During the lesson, I ask questions to teachers	3.26	0.89	Uncertain
6.	We discuss several question items in a group	3.40	1.04	Uncertain
7.	I note several materials that I have not understood	3.66	0.75	Good
<i>Using a variety of Strategies</i>				
8.	I am studying material that I have not mastered yet	3.48	0.76	Good
9.	I became more aware of the right strategy for	3.45	0.81	Good
10.	Based on the assessment results, I need to study harder to obtain better results	3.75	0.78	Good
11.	I will do my best to complete the assignments	3.43	1.05	Good
12.	I become an independent learner during online learning, and I do it seriously	3.60	0.82	Good
Assessment As Learning		3.52	0.67	Good

VHS Students' Perception of the Assessment of Learning in Online Learning

Data on VHS Students' Perceptions of the AoL in online learning can be seen in Table 3 below.

Table 3. Students' Perception of the Assessment of Learning

No.	Aspects/Items	M	SD	Classification
<i>Learning Standard</i>				
1.	Teachers inform the learning and assessment materials at the beginning of the learning	3.59	0.82	Good
2.	Teachers explain the assessment of learning outcomes, including final grade criteria	3.55	0.81	Good
3.	Teachers inform the assessed criteria	3.57	0.87	Good
<i>Measuring Instrument</i>				
4.	Teachers explain the assessment guidelines before making the assessment	3.60	0.88	Good
5.	The teacher uses the right test instrument for Knowledge	3.53	0.90	Good
6.	The teacher uses the right test instrument for skills	3.52	0.93	Good
<i>Testing</i>				
7.	Mid and Final semester exam is done based on the schedule	3.86	0.86	Good
8.	Content for mid and final exams is based on the taught material	3.61	0.88	Good
9.	The difficulty level of the test item follows the depth of the material being taught	3.44	0.89	Good
10.	Time allocation to complete the test is sufficient	3.62	0.81	Good
11.	The exam runs smoothly	3.54	0.96	Good
12.	I enjoy the implementation of online test	3.44	1.02	Good
<i>Grading & Feed Back</i>				
13.	The mid and final exam results are given to students on time	3.41	0.96	Good
14.	The mid and final exam results are in line with Students' expectation	3.48	0.81	Good
15.	The final score is calculated based on the Formula predetermined	3.38	0.80	Uncertain
16.	Teachers give feedback related to mid and final exam results	3.61	0.84	Good

Table 3. Continued

No.	Aspects/Items	M	SD	Classification
17.	Teachers give the final assessment results to students on time	3.46	0.80	Good
18.	Teachers inform the results of the assessment	3.42	0.84	Good
19.	The learning reports (per semester) contain the achievement learning outcomes based on the requirements standard	3.52	0.85	Good
20.	Reports on learning outcomes contain the value of achievement of learning outcomes according to the provisions	3.68	0.84	Good
Assessment Of Learning		3.55	0.70	Good

Based on these data, this study concluded that the AoL was carried out correctly. Item number 7, "mid and final semester exam is done based on the schedule," gets the highest mean value ($M=3.86$). Conversely, several items get low scores. Item number 15, "the final score is calculated based on the predetermined formula," got the lowest score ($M=3.38$) in the uncertain category. Item number 13, "the mid and final exam results are given to students on time," and Item number 18, "teachers inform the results of the assessment to the teacher," also got the low ones. Efforts to improve learning and assessment need to be made on those items.

VHS Students' Perception of the Assessment in Online Learning

Overall, the student's perception of the assessment in online learning can be seen in Table 4 below.

Table 4. Students' Perception of the Assessment in Online Learning

No.	Aspects/Items	M	SD	Classification
<i>Assessment For Learning</i>				
1.	Assessing	3.52	0.75	Good
2.	Diagnosing	3.67	0.78	Good
3.	Remediating	3.56	0.69	Good
	Mean	3.57	0.67	Good
<i>Assessment as Learning</i>				
1.	Monitoring their learning	3.55	0.71	Good
2.	Asking question	3.44	0.72	Good
3.	Using a variety of strategies	3.54	0.70	Good
	Mean	3.52	0.67	Good
<i>Assessment of Learning</i>				
1.	Learning standard	3.57	0.78	Good
2.	Measuring instrument	3.55	0.78	Good
3.	Testing	3.58	0.77	Good
4.	Grading & Feedback	3.49	0.68	Good
5.	Reporting	3.55	0.70	Good
	Mean	3.55	0.67	Good
Assessment in Online Learning		3.54	0.66	Good

The student's perception of the assessment in online learning is in good category ($M=3.54$). Three aspects with the lowest mean scores are asking questions ($M=3.44$) and grading & feedback ($M=3.48$). Based on Table 4, which presents students' perception of assessment in online learning, AfL, AaL, and AoL are considered Good. In general, according to students, online learning assessment was conducted well. Students did not experience significant problems finishing the assessment, either AfL, AaL, or AoL. Nonetheless, three components are getting the lowest mean values: remediating, asking questions, and grading & providing feedback. Students' assessment in the online environment has been a concern in this current circumstance. It raises the issue of monitoring students' progress and providing effective feedback. Using technology to communicate with students and manage effective learning processes is demanded to decrease the constraints of being geographically separated. Each of these areas will be beneficial after further exploration. Online discussion is often used as a common strategy in online learning.

*The Differences in Students' Perception of the Assessment during Online Learning Based on the Grades**Table 5. Students' Perception of the Assessment Based on the Grades*

Grade	N	M	SD	Classification
X	139	3.81	0.65	Good
XI	296	3.38	0.62	Good
XII	52	3.90	0.62	Good
Total	487	3.56	0.67	Good

The tenth-grade students' perception of assessment in online learning is in a good category (Mean=3.81). Likewise, the grade XI students' perception is Good (Mean=3.38). Then, the grade XII students' perception of online learning is Good (Mean=3.90). Based on the data in Table 5, the highest to the lowest mean values are obtained by students in grades XII, X, and XI, respectively.

Table 6. Differences in Students' Perceptions of the Assessment

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24.127	2	12.064	29.870	.000
Within Groups	195.472	484	.404		
Total	219.599	486			

Table 5 and Table 6 show a significant difference in students' perceptions of the assessment in online learning, with an F value of 29.870 and a significance level of $p < .00$. The perception of the twelfth-grade students is the highest ($M=3.90$) of all classes because the eleventh-grade mean value is 3.38, and the tenth-grade mean value is 3.81. Several possibilities might influence the twelfth-grade students' high mean scores. The more experienced students attend online lectures and assessments, the easier to master online learning materials. The student's attitude has become more favorable toward online assessment (Zhu et al., 2020). The twelfth-grade students are more experienced in online learning and assessment than the lower grades.

Discussion

This study aimed to obtain accurate information on learning assessments for VHS students during online learning, including AfL, AaL, and AoL. The results show that most VHS students positively perceive the assessment of learning achievements in online learning for AfL, AaL, and AoL aspects. Moreover, there is a significant difference in students' perceptions of the assessment in online learning based on grades. The perception of grade XII students is the highest of all grades.

The research results on AfL obtained a value of $M=3.57$, classified as a good category. Students agree that the Assessment for Learning has been carried out correctly. However, several points from the AFL aspect become obstacles in AfL. The results of this study are almost the same as those of Slack and Priestley (2023), which revealed that AfL could be implemented. Still, some participants felt that assessment had 'become more stressful by introducing remote, electronic examinations during the COVID-19 pandemic. The results of this study are slightly different from the results of research conducted by Yusron and Sudiyatno (2021), which revealed that the implementation of AfL in the learning process at elementary schools is in a poor category.

Assessment for learning could facilitate students' learning. It can help students learn if it provides information that teachers and their students can use as feedback in assessing themselves and modifying the learning activities (Flórez & Sammons, 2013). Assessment for Learning is a form of formative assessment because there is a process of collecting information to decide whether the learning process runs as planned. It is a process by which teachers use assessment information to adjust their teaching strategies, and students change their learning strategies. AfL encourages learning and improves motivation by emphasizing progress and achievement rather than failure. The data demonstrates that formative evaluation improves educational outcomes and benefits teachers and students. To encourage the development of abilities among students at all levels and to enhance educational services, it is crucial to increase the processes of educational evaluation through the formative approach. The teaching-learning process is essential to obtain the expected learning outcomes for students, even when it is not only synthesized in the evaluation process (Guevara-Fernández et al., 2022).

According to Howard et al. (2019), participation in the remediation process positively impacts the final examination results among moderate to high-achieving students. However, low-achieving students only gain minimal benefits because they need to achieve adequate understanding. It makes the remediation improve their knowledge. AfL supports students' cognitive, affective, and psychomotor aspects. It is consistent with the National Education Philosophy cited by (Mukhtar & Ahmad, 2015). After a year of the lesson, they are no longer evaluated, and as an alternative, they are assessed as they learn. The use of AfL in vocational-technical education can help students become more aware of their obligation to learn. It also highlights their potential and motivates them to be independent learners.

The research results on AaL obtained a value of $M=3.52$, classified as a good category. This study concluded that the Assessment of Learning was carried out correctly. However, several points in the aspect of 'asking questions' still need to be optimally implemented in AaL. Research by Lora et al. (2019) revealed different results, namely the assessment for and as learning carried out in the learning process had yet to be fully implemented. Only 53.5% of teachers understand assessment as learning.

Implementing AaL affects students' learning achievements, provides opportunities to assess their learning progress, and encourages them to become independent learners. According to Dann (2014), AaL recognizes that learners must actively engage in meaningful classroom interactions. The judgments are that learners enable them to advance their learning. It can make students aware of themselves as part of a repertoire of learning skills and knowledge understandings. The students will have a role in self-assessment, peer assessment, or in providing discursive feedback, which all encourage the forms of AaL in action. AaL is not a superficial change. It is instead a fundamental shift in teaching, assessment, and relationship. Students became more responsible for their learning, which, in turn, enhanced their learning motivation. They admitted that sharing sessions about success criteria, peer support, and teacher feedback helped engage them in their learning process. They were allowed to improve their work before the final deadline (Schellekens et al., 2021). When using AaL in the classroom, peer and self-assessment effectively enhanced the students' learning. Self and peer assessment should be optimized to help students and teachers improve their teaching performance by realizing their strengths and revising their weaknesses (Ratminingsih et al., 2017).

The research results on Aof obtained a value of $M=3.55$, classified as a good category. Even so, several points in the 'grading & feedback' aspect, asking questions, and implementing online tests in the AoL still need to be more satisfying. In addition, the implementation of online assessment requires the support of adequate electronic devices. The primary device students use in the online assessment is a mobile phone. Not all students have adequate mobile phones or are skilled at using these devices for online learning and assessment. This is to the results of research by Yulianto and Mujtahid (2021), which revealed that most teachers thought that online assessment took much work because many problems arose during this implementation. Nevertheless, the teacher does not deny that online assessment helps deliver learning material and give assignments to students during this pandemic. Assessments in online learning can be carried out but experience various obstacles, both from supporting devices and constraints from students/teachers. Topuz et al.'s (2022) research results also show that some online assessment systems must be mobile-friendly. However, attending assessments online via mobile devices can ensure flexibility in education.

Assessment of Learning in online platforms should cover both assessments of learning outcomes and processes (Lile & Bran, 2014). Teachers demand to make efforts to provide sufficient assessment instruments. One factor that should be considered is accommodating students' different features and preferences to decide how they might exhibit their learning outcomes and competencies. Combining evaluation methods or procedures ought to aid in accomplishing learning objectives (Montenegro & Jankowski, 2017). Though it is classified as Good, students faced difficulties implementing online tests in the AoL. The implementation of AoL should be improved. To maintain the educational standards and guarantee the effectiveness of online learning, teachers should conduct summative assessments regularly, for instance, twice per semester (Basta, 2009). The results of the mid and final exams are beyond the students' expectations, so it is necessary to improve the implementation of the assessment of learning.

Assessment in learning is done informally in question-and-answer sessions, quizzes, assignments, daily tasks, and other formative forms. An informal formative assessment like quizzes and simple questions is essential in building students' motivation, sincerity, and learning comfort. Dialogue with students should be done during the assessment process. Through this dialogue, assessment literacy can be developed so that students can have more positive thoughts and play an active role in the assessment process (Spiller, 2015). A positive attitude towards the assessment will enhance learning motivation and build students' positive character.

Each learner has a unique personality and a set of skills. It is also essential to vary the learning process to accommodate both high and low performers. Some students might be able to adjust to conventional classroom instruction easily, but others might find it challenging (Maawa & Ortega-Dela Cruz, 2019). Remedial teaching functions to help students to achieve the expected results since it is designed based on the students' characteristics and learning difficulties. This activity is intended to assist students who struggle to master the content. Remediation is merely presenting the same content, typically slower, to give pupils enough time to comprehend the information. This should not be confused with re-teaching concepts.

The mean value of "Asking the question" in this study is the lowest, although it belongs to the Good category. In general, the weakness of VHS students is related to their reluctance to ask teachers about the materials they are studying. Likewise, the teachers need to provide better-guiding questions to the students. Asking questions is crucial for the success of the teaching and learning process. Unfortunately, asking higher-level questions is uncommon among teachers and students (Almeida, 2012).

Moreover, online learning and assessment must be connected to the use of technology. Students with adequate information and communication technology skills tend to have a positive attitude toward online learning. This means that students' attitude toward online assessment is influenced by technological mastery (Drennan et al., 2005).

Loi and Ang (2022) showed a positive change in students' attitudes toward online learning and assessments. The interview results reflect how external factors, namely institutional support, new and helpful knowledge, technology literacy, accessibility, self-efficacy, and enjoyment, play an essential role in shaping the students' attitudes. It can be deduced from the findings that online learning use during the pandemic is influenced by attitude change, which is also determined by external factors.

Conclusion

This study aimed to obtain accurate information on learning assessments for VHS students during online learning, including AfL, AaL, and AoL. It also investigated students' perceptions of the assessments based on their grades. In online learning, VHS students feel that AfL, AaL, & AoL are going well and support the learning process. However, none of the aspects in the assessment are included in the Excellent category. This means that implementing assessments in online learning still needs to be improved.

Several factors influence online assessment, including the importance of providing various online assessment tools and the teacher's ability to use all online assessment-related tasks, such as creating assignments and ordering questions. Various online assessment tools are critical for students because they assess the content deeply. The ability of teachers and students to use online assessment tools and the limited number of these tools are factors that need to implement online assessments at VHS optimally. The Ministry of Education and Culture of the Republic of Indonesia has issued an online learning and assessment policy.

This study also showed that the perceptions of Grade XII students were better than those of Grade X and XI students because Grade XII students had already studied and used information & communication technology in learning. The findings of this study become new knowledge of assessment in online learning.

Recommendations

As a follow-up to the results of this study, it is necessary to conduct comprehensive research on the accuracy of the application of AfL, AaL, and AoL in VHS. This recommendation was proposed because the application of AfL, AaL, and AoL to VHS still varies. In addition, how the application of AfL, AaL, and AoL in online learning on learning outcomes also needs to be studied.

The perceptions of Grade XII students were better than those of Grade X and XI students because Grade XII students had already studied and used information & communication technology in learning. The knowledge and skills of VHS students in information and communication technology need to be imparted from the beginning (Grade X). Besides that, it needs to be studied how VHS students' mastery of information and communication technology influences assessment in online learning.

The availability of ICT equipment facilities in VHS varies greatly, ranging from inadequate to very adequate. Therefore, the Ministry of Education and Culture of the Republic of Indonesia must provide ICT facilities for schools with inadequate equipment to support effective learning and assessment.

Limitations

Implementing online assessment and learning at VHS is quite diverse. This is due to the need for standard online assessment and learning guidelines that should have been issued by the Ministry of Education and Culture of the Republic of Indonesia. Besides that, supporting facilities, especially information and communication tools owned by vocational high schools, and the ability of teachers to carry out assessments and online learning also vary. Likewise, vocational high school students must thoroughly know the proper online assessment and learning implementation. Thus, it can reduce the accuracy of the results of this study.

Acknowledgments

We convey our highest appreciation to colleagues at the Department of Electrical Engineering Education, Faculty of Engineering, Yogyakarta State University, Indonesia, for supporting this research.

Authorship Contribution Statement

Supriyadi: Conceptualization, design, analysis, drafting manuscript, & writing. Kholis: Editing/reviewing, supervision, technical or material support, admin. Haryanto: Data acquisition, data analysis/interpretation, critical manuscript revision, statistical analysis. Hadi: Critical revision of the manuscript, technical or material support, securing funding.

References

- Almeida, P. A. (2012). Can I ask a question? The importance of classroom questioning. *Procedia-Social and Behavioral Sciences*, 31, 634-638. <https://doi.org/10.1016/j.sbspro.2011.12.116>
- Ade-Ojo, G. O., & Duckworth, V. (2020). Moments in transformation: Newly qualified lifelong learning teachers'

- reconceptualization of assessment in practice. *Creative Education*, 11(11), 2477–2497. <https://doi.org/10.4236/ce.2020.1111182>
- Basta, T. (2009, May 8-9). *Assessment impact on online learning credibility* [Conference session]. American Canadian Conference for Academic Disciplines, Toronto, Canada. <https://bit.ly/3Kjldko>
- Berry, R. (2008). *Assessment for learning* (Vol. 1). Hong Kong University Press. <https://doi.org/10.5790/hongkong/9789622099579.001.0001>
- Dann, R. (2014). Assessment as learning: Blurring the boundaries of assessment and learning for theory, policy and practice. *Assessment in Education: Principles, Policy and Practice*, 21(2), 149–166. <https://doi.org/10.1080/0969594X.2014.898128>
- Denmark Ministry of Education. (2014). *Improving vocational education and training: An overview of Danish vocational education system reform* (Document number: TD/TNC 117.703). Danish Ministry of Education. <http://hdl.voced.edu.au/10707/321567>
- Dhawan, S. (2020). Online learning: A panacea in the time of covid-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- Directorate-General for Employment, Social Affairs and Inclusion. (2018, September 25). *What is vocational education?* <http://bitly.ws/Qclu>
- Drennan, J., Kennedy, J., & Pisarski, A. (2005). Factors affecting student attitudes toward flexible online learning in management education. *Journal of Educational Research*, 98(6), 331–338. <https://doi.org/10.3200/JOER.98.6.331-338>
- Elzainy, A., El Sadik, A., & Al Abdulmonem, W. (2020). Experience in e-learning and online assessment during the COVID-19 pandemic at the College of Medicine, Qassim University. *Journal of Taibah University Medical Sciences*, 15(6), 456–462. <https://doi.org/10.1016/j.jtumed.2020.09.005>
- Flórez, M. T., & Sammons, P. (2013). *Assessment for learning: Effects and impact*. CfBT Education Trust.
- Guevara-Fernández, J. A., Carranza-Dávila, R. G., Ríos-Lozada, R. N., Ramirez-Delgado, J. G., & Hernández-Fernández, B. (2022). Perspectives of formative assessment in learning: A systematic review. *Journal of Positive School Psychology*, 6(2), 1672–1683. <https://bit.ly/3R7tRrd>
- Howard, E., Meehan, M., & Parnell, A. (2019). Quantifying participation in, and the effectiveness of, remediating assessment in a university mathematics module. *Assessment and Evaluation in Higher Education*, 44(1), 97–110. <https://doi.org/10.1080/02602938.2018.1476670>
- Iftakhar, S. (2016). Google classroom: What works and how. *Journal of Education and Social Sciences*, 3, 12–18. <http://bitly.ws/Qcls>
- Jimaa, S. (2011). The impact of assessment on students learning. *Procedia-Social and Behavioral Sciences*, 28, 718–721. <https://doi.org/10.1016/j.sbspro.2011.11.133>
- Jović, M., Stanković, M. K., & Nešković, E. (2017). Factors affecting students' attitudes towards e-learning. *Management Journal of Sustainable Business and Management Solutions in Emerging Economies*, 22(2), 73–80. <https://doi.org/10.7595/management.fon.2017.0016>
- Khairil, L. F., & Mokshein, S. E. (2018). 21st century assessment: Online assessment. *International Journal of Academic Research in Business and Social Sciences*, 8(1), 649–662. <https://doi.org/10.6007/IJARBS/v8-i1/3838>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- LaRocque, N. I. A. (2015). *Summary of Indonesia's education sector assessment*. ADB papers on Indonesia. <http://bitly.ws/QcKH>
- Lile, R., & Bran, C. (2014). The assessment of learning outcomes. *Procedia-Social and Behavioral Sciences*, 163, 125–131. <https://doi.org/10.1016/j.sbspro.2014.12.297>
- Loi, C. K., & Ang, M. (2022). Online learning and online assessments: Attitude change and students' perceptions. *Malaysian Journal of Social Sciences and Humanities*, 7(4), Article e001412. <https://doi.org/10.47405/mjssh.v7i4.1412>
- Lora, H. A., Rosidin, U., & Distrik, I. W. (2019, October 26–27). *The analysis of implementation of assessment for learning and assessment* [Conference session]. International Conference on Progressive Education. Lampung, Indonesia. <https://doi.org/10.2991/assehr.k.200323.116>
- Maawa, P. K. L., & Ortega-Dela Cruz, R. (2019). Remedial and corrective feedback strategies for improving students' English language proficiency. *International Journal of Language Education*, 3(1), 1–11.

<https://ojs.unm.ac.id/ijole/article/view/7794>

- Mahdiansyah, M. (2018). *Evaluasi pelaksanaan sistem penilaian hasil belajar siswa (studi kasus di enam kota)* [Evaluation of the implementation of the student learning outcomes assessment system (case studies in six cities)]. *Jurnal Penelitian Kebijakan Pendidikan*, 11(2), 48-63. <https://doi.org/10.24832/jpkp.v11i2.224>
- Ministry of Education and Culture. (2020). *Pelaksanaan kebijakan pendidikan dalam masa darurat penyebaran corona virus disease (Covid-19)* [Implementation of education policies during the emergency period of the spread of corona virus disease (Covid-19)] (Circular Letter Number 4/2020). Ministry of Education and Culture. <http://bitly.ws/PMRt>
- Montenegro, E., & Jankowski, N. A. (2017). *Equity and assessment: Moving towards culturally responsive assessment*.
- National Institute for Learning Achievement Assessment. <https://bit.ly/47wTLea>
- Mukhtar, M. I., & Ahmad, J. (2015). Assessment for learning: Practice in TVET. *Procedia-Social and Behavioral Sciences*, 204, 119-126. <https://doi.org/10.1016/j.sbspro.2015.08.124>
- Nahadi, N., Firman, H., & Farina, J. (2015). Effect of feedback in formative assessment in the student learning activities on chemical course to the formation of habits of mind. *Indonesian Journal of Science Education/Jurnal Pendidikan IPA Indonesia*, 4(1), 36-42. <https://bit.ly/40Npr1>
- Parsa, I. M. (2015). Pengaruh bentuk penilaian formatif dan hasil belajar mata pelajaran adaptif terhadap hasil belajar praktik kewirausahaan [The influence of formative assessment forms and adaptive subject learning outcomes on entrepreneurial practice learning outcomes]. *Innovation of Vocational Technology Education*, 11(1), 79-90. <https://bit.ly/3GdSvjn>
- Putri, C. A. (2021, November 5). *Duh! Lulusan SMK paling banyak jadi pengangguran* [Duh! Most VHS graduates become unemployed]. CNBC Indonesia. <http://bitly.ws/PZSx>
- Ragupathi, K. (2020). *Designing effective online assessments: Resource guide*. National University of Singapura. <http://bitly.ws/PUus>
- Ratminingsih, N. M., Artini, L. P., & Padmadewi, N. N. (2017). Incorporating self and peer assessment in reflective teaching practices. *International Journal of Instruction*, 10(4), 165-184. <https://doi.org/10.12973/iji.2017.10410a>
- Ruhana, F. (2018). Analisis penerapan seleksi calon pegawai negeri sipil berbasis computer assisted test (CAT) pada Badan Kepegawaian Negara [Analysis of the application of computer assisted test (CAT)-based civil servant candidate selection at the National Civil Service Agency]. *Jurnal MSDM IPDN*, 5(2), 1-28. <https://rb.gy/83eam>
- Salleh, S. M., Jawawi, R., & Abdullah Teo, S. N. N. S. (2022). Factors influencing teachers' implementation of online teaching and learning mode during covid-19. *International Journal of Instruction*, 15(4), 819-834. <https://doi.org/10.29333/iji.2022.15444a>
- Schellekens, L. H., Bok, H. G. J., de Jong, L. H., van der Schaaf, M. F., Kremer, W. D. J., & van der Vleuten, C. P. M. (2021). A scoping review on the notions of Assessment as Learning (AaL), Assessment for Learning (AfL), and Assessment of Learning (AoL). *Studies in Educational Evaluation*, 71, Article 101094. <https://doi.org/10.1016/j.stueduc.2021.101094>
- Sicat, A. S. (2015). Enhancing college students' proficiency in business writing via schoology. *International Journal of Education and Research*, 3(1), 159-178. <http://bitly.ws/QcQS>
- Singh, V., & Thurman, A. (2019). Many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education*, 33(4), 289-306. <https://doi.org/10.1080/08923647.2019.1663082>
- Slack, H. R., & Priestley, M. (2023). Online learning and assessment during the Covid-19 pandemic: Exploring the impact on undergraduate student well-being. *Assessment and Evaluation in Higher Education*, 48(3), 333-349. <https://doi.org/10.1080/02602938.2022.2076804>
- Spiller, D. (2015). *Principles of assessment: Teaching Development Unit, Wāhanga Whakapakari Ako*. The University of Waikato. <https://bit.ly/3G9hlks>
- Subehi, R., & Sriyanto, S. (2021). Implementasi assessment of, for, dan as learning dalam pembelajaran daring PAI di SMPN 8 Purwokerto [Implementation of assessment of, for, and as learning in PAI online learning at SMPN 8 Purwokerto]. *Alhambra Jurnal Studi Islam*, 2(2), 111-122. <https://doi.org/10.30595/ajsi.v2i2.10632>
- Sugiyono, S., Lastariwati, B., Budiastuti, E., & Yudianto, A. (2018). Development of authentic assessment instruments for scientific learning in tourism vocational high schools. *Jurnal Pendidikan Teknologi dan Kejuruan*, 24(1), 52-61. <https://doi.org/10.21831/jptk.v24i1.16670>

- Supriyadi, E. (2019). Penyelenggaraan penilaian hasil belajar SMK rujukan program keahlian teknik ketenagalistrikan di Daerah Istimewa Yogyakarta [Implementation of assessment of learning outcomes of referral VHS for electrical engineering expertise programs in the special region of Yogyakarta]. *Jurnal Edukasi Elektro*, 3(2), 70-80. <https://doi.org/10.21831/jee.v3i2.29119>
- Topuz, A. C., Saka, E., Fatsa, Ö. F., & Kurşun, E. (2022). Emerging trends of online assessment systems in the emergency remote teaching period. *Smart Learning Environments*, 9, Article 17. <https://doi.org/10.1186/s40561-022-00199-6>
- Trismayanti, N. K. (2021). The effectiveness of formative assessment in improving students' writing skill. *Jurnal Ilmiah Pendidikan Profesi Guru*, 4(2), 158-164. <https://doi.org/10.23887/jippg.v4i2>
- Wiliam, D. (2013). Assessment: The bridge between teaching and learning. *Voices from the Middle*, 21(2), 15-20.
- Xu, H., & Mahenthiran, S. (2016). Factors that influence online learning assessment and satisfaction: Using Moodle as a Learning Management System. *International Business Research*, 9(2), 1-18. <https://doi.org/10.5539/ibr.v9n2p1>
- Yulianto, D., & Muhtahid, N. M. (2021). Online assessment during COVID-19 pandemic: EFL teachers' perspectives and their practices. *Journal of English Teaching*, 7(2), 229-242. <https://doi.org/10.33541/jet.v7i2.2770>
- Yusron, E., & Sudiyatno, S. (2021). How is the impact of Assessment for Learning (AfL) on mathematics learning in elementary schools? *Jurnal Prima Edukasia*, 9(1), 75-84. <https://doi.org/10.21831/jpe.v9i1.34865>
- Zhu, Y., Zhang, J. H., Au, W., & Yates, G. (2020). University students' online learning attitudes and continuous intention to undertake online courses: A self-regulated learning perspective. *Educational Technology Research and Development*, 68, 1485-1519. <https://doi.org/10.1007/s11423-020-09753-w>