Student performance assessment strategies by involving peer students

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Abstract. One of the important factors in achieving students’ learning outcomes is the implementation of assessment on the learning. It is vital to uncover or obtain information related to the students’ achievement of the competencies comprehensively. Therefore, data is needed as an item of evidence and basis for decision making regarding the student’s achievement of the competencies. To allow the students to demonstrate their competencies is one of the processes in collecting those items of evidence. Students demonstrating their competencies is a type of student performance. As a result, there is a need to engage with this performance assessment. The aim of the present study was to conduct the students’ performance assessment by using Google Form and the involvement of peer students. Google form is an alternative computer-based assessment. The application is easy to use with the availability of useful features. It is also relevant to be used today as learning and teaching are mostly conducted online. Based on the performance assessment that involved peer students, score distribution in every performance task given was born in the normal curve. The result showed that the involvement of the peer students in the performance assessment yields positive outcomes. It can be said that the involvement of the peer students in assessment guaranteed the objective assessment based on the given rubrics.

1. Introduction
Quantitative measurement and qualitative evaluation are inspirable integral parts of assessment [1]. Arikunto states that assessment functions as selection, diagnostic, placement, and success measurement [2]. One of the important factors in achieving students’ learning outcomes is the implementation of assessment on the learning. It is vital to uncover or obtain information related to the students’ achievement of the competencies comprehensively. As a result, the aim of the student’s assessment involves whole components of the process and outcome of the students in the learning and teaching activity.

The assessment of the students’ competencies is conducted during the learning and teaching process. Therefore, data is needed as the basis for decision making regarding the student’s achievement of the competencies. Uno and Koni state that assessment processes need items of evidence that are collected deliberately, systematically, and continuously which is used to measure the competence of the students [1]. The processes of collecting the item of evidence are: 1) give the opportunity to students to demonstrate their competencies, 2) collect and note all evidence of competencies demonstrated by the students, 3) use those items of evidence that have been collected to conduct assessment comprehensively on the student’s performance in the intended competencies.
The performing task that has been done by students is part of the students’ performance. Soon after the evidence of the students’ performance has been collected, the assessment must be conducted to see how well students have achieved their competencies. Assessing the performance of the students is well known as performance assessment. Assessing the performance of the students involves variation in the task model, assessment instrument, and also variation in the assessment model on the given task. Therefore, innovation is needed in the assessment process to ensure its accountability, effectiveness, efficiency, and involvement of the students. This can be achieved by using information and communication technology. Considering the advantages of information and communication technology, it is important to integrate technology into the teaching and learning process, especially on the assessment. Moreover, open-source software is now easy to find. It in turn can facilitate the integration of the information and communication technology into teaching and learning. The present study integrated computer-based performance assessment. The aim of the study was to assess the performance of the students by using google forms and involve peer students. The usage of google form is an alternative in the computer-based assessment. Moreover, this application is easy to use. It is also relevant to be used nowadays as most of the teaching and learning are conducted online. So, it becomes a good combination, between the teaching and learning process and a computer-based assessment.

2. Class-based assessment
Assessment is an important part of the teaching and learning process as it can determine how well students understand the material, how effective the method is, and how well the material is carried. Soetomo stated that assessment can be used to improve the teaching and learning process. Conversely, without assessment, teachers cannot determine how well the students are [3]. Moreover, Soetomo stated that assessment can be done before, during, or after the presentation of the teaching material. The purpose of the assessment is to gather relevant information about the performance or progress of the students. Based on that information, follow up actions that can be taken are 1) exact placement, 2) giving feedback, 3) diagnosing learning difficulty, and 4) determinant in grading and graduation of the students from certain education institution [4]. The principles of assessment are that assessment must be comprehensive, integrative, and sustainable. The assessment has to be able to uncover the individual advantages of the students, therefore assessment must be students centered. This kind of assessment is a classroom-based assessment, in which the teacher performs an assessment that is based on the student's need. Basic principles that have to be noted during the implementation of classroom-based assessment are motivating, validity, fairness, nondirective, sustainability, meaningfulness, comprehensiveness, and educative [5].

Teachers can use a variety of assessment tools to assess the process and students’ learning output. Basically, those assessment tools can be categorized into two, namely test and non-test [1]. The test is used to assess student intelligence. Non-test on the other hand is used to assess value and students' behavior. Moreover, a non-test is also used to assess student learning output. A competency-based curriculum recommends class-based assessment. The assessment process requires an item of evidence that has been collected deliberately, systematically, and continuously. The process of collecting evidence includes 1) give students a chance to demonstrate their competency, 2) collect and note all the evidence of the demonstration done by students, 3) use those evidences as the basis for assessing the performance or competency of the students comprehensively.

The achievement of the student's competence can be examined by looking at the task accomplished by the students. By accomplishing the given task, teachers can determine how well students can use their knowledge and skill to complete tasks in accordance with the purpose of teaching and learning. Therefore, there is a need to set the competence that has to be achieved by students. This kind of assessment is known as performance assessment that further can be categorized as a non-test. Koyan stated that performance assessment is done by giving tasks and assignments to acquire information about how well the students have learned [4]. Koyan also states that the performance assessment can be in the form of 1) individual or group assignment, 2) action test, 3) long term project, for individual, group or
combination of individual and group, 4) portfolio 5) demonstration, 6) experiment, 7) oral presentation and 8) simulation.

The process of assessing students cannot be done without the involvement of the student. This is because students are objects of the assessment. Therefore, the involvement of students is the main issue in the assessment. Some studies even involve students in the assessment. The involvement of the students is that students assess themselves and their friends on the related task given to them. One of such research was done by Setemen and friends who developed peer assessment [6]. The system developed by Setemen and friends was about how students were involved in the assessment process to produce an objective assessment. Involving students in the assessment can avoid the teacher subjectivity. Therefore, the assessment of student tasks and assignments becomes objective and accurately measures the extent of the competencies that have been achieved by students. The involvement of the students in the assessment will reduce the role of the teacher in the assessment. Thus, the justification for the competencies that students have achieved in learning can be more objective.

3. Methodology

This research was descriptive research. Descriptive research describes a phenomenon of strategy in assessing student performance that involves peer students. Specifically, this research was a survey on teachers and students related to the student assessment process done by the lecture as well as student opinions regarding student involvement in assessment. In the final stage of the research, a performance assessment instrument was developed to assess student performance in the final course project. The instrument developed was used to assess the projects that have been collected by students. Then, this instrument is given to students to conduct peer assessments on the projects that have been collected. The samples involved in this study were 10 teachers and a class of 20 students.

4. Result and discussion

In the initial stage of the research, a survey was carried out to teachers related to the preparation and implementation of student assessments. The instrument used in this survey was a questionnaire given to the teacher with a choice of "yes" or "no" answers that described whether the question or statement was made or not by the teacher. The details of the instruments and the results of this survey are shown in table 1.

| No | Statements                                                                 | Response percentage |
|----|-----------------------------------------------------------------------------|---------------------|
|    |                                                                             | Yes     | No     |
| 1  | There is a clear plan for conducting the assessment on the teaching and learning process. | 100%   | 0%     |
| 2  | Involve colleague in designing the assessment process                       | 30%    | 70%    |
| 3  | Self-assignment type or assessment criteria suitable for the course characteristic | 70%    | 30%    |
| 4  | Self-made instrument/assessment rubric                                     | 70%    | 30%    |
| 5  | Use the non-test instrument on the assessment (performance or portfolio)    | 40%    | 60%    |
| 6  | Use the test instrument on the assessment (multiple choice or essay)        | 60%    | 40%    |
| 7  | The criteria of the assessment are non-directive (communicated with the students) | 40%    | 60%    |
| 8  | The assessment is done only by the teacher                                 | 90%    | 10%    |
| 9  | Assessment involves students to assess themselves                          | 10%    | 90%    |
| 10 | Assessment involves students to assess their peer students                 | 10%    | 90%    |
| 11 | Networked Computer-based assessment                                         | 30%    | 70%    |
| 12 | It is good to involve students in the assessment process                    | 60%    | 40%    |
Based on Table 1, in general, all teachers had planned student assessment activities. However, the collaboration of teachers in planning the assessment was still low at only 30%. Moreover, the instruments used by the teachers were mostly tests, either in the form of multiple-choice or essays (60%). The dominance of teachers in assessing students was high, namely 90%. This means that the assessment process was still teacher-centered and had not involved students in the assessment. This means that students were only the object of assessment. On the other hand, most teachers agree that students were involved in the assessment and not only as an object of assessment.

The other survey was aimed at students related to assessments that involve students in the assessment process. The instrument used was a questionnaire with 10 questions with "yes" or "no" answers related to the assessment process. Instrument details and survey results are shown in Table 2.

**Table 2.** The result of survey on the assessment that involves students.

| No | Questions                                                                 | Response percentage |
|----|---------------------------------------------------------------------------|---------------------|
|    |                                                                           | Yes  | No  |
| 1  | Have you ever conducted a self-assessment on teaching and learning?       | 25%  | 75% |
| 2  | Have you ever assessed your peer?                                        | 20%  | 80% |
| 3  | Does self-assessment benefit students?                                   | 75%  | 25% |
| 4  | Does peer assessment benefits students?                                  | 80%  | 20% |
| 5  | Is self-assessment needed?                                               | 85%  | 15% |
| 6  | Is peer assessment needed?                                               | 85%  | 15% |
| 7  | Are self-assessments and peer assessments trustworthy?                    | 75%  | 25% |
| 8  | Are self-assessments and peer assessments objective?                     | 75%  | 25% |
| 9  | Do you agree with self-assessment and peer assessment?                   | 90%  | 10% |
| 10 | Do you agree that self-assessment and peer assessment have a higher score than assessment by the teacher? | 90%  | 10% |

Based on Table 2 above, it can be seen that most students benefit from conducting self and peer assessments. This is clear evidence that involving students in the assessment is beneficial for the students themselves. The objectivity and level of confidence in the assessment by students are also high (as in points 7 and 8 in table 2). This means that, in assessing peers, students actually assessed according to the rubric or instrument given on the assessment of the student's assignment or exam. Based on these results, it is good for teachers to consider conducting an assessment that involves students in it.

The involvement of students to assess their peers is implemented in one subject with the assessment of a performance task. The performance tasks given to students were creating a web using the WordPress Content Management System (CMS) individually. The web assignment was then assessed by peers using a performance rubric that had been prepared by the teacher. The performance rubric used to assess this performance task is shown in Table 3 below.
Table 3. Assessment rubric for task of creating cms wordpress-based web.

| No | Assessment criteria                       | Score |
|----|------------------------------------------|-------|
| 1  | Easy to learn                            | 1     |
| 2  | Usage Efficiency                         | 2     |
| 3  | Easy to remember                         | 3     |
| 4  | Level of Error frequency                 | 4     |
| 5  | Level of user satisfaction                | 5     |
| 6  | Navigation system                        |       |
| 7  | Graphic design                           |       |
| 8  | Content                                  |       |
| 9  | Compatibilities                          |       |
| 10 | Loading time                              |       |
| 11 | Functionality                             |       |

Explanation:
Score 1 = Very poor
Score 2 = Poor
Score 3 = Normal
Score 4 = Good
Score 5 = Very good

The process of assessing student performance was carried out online. The application used for the implementation of the assessment was the google form. Before an assessment is carried out by students, the first thing to be done was preparing a google form containing performance assessment items. The google form-based assessment instrument form is presented in Figure 1 below.

Figure 1. Assessment rubric with the google form.
After the assessment rubric was completed, then this rubric link distributed to all students for further use as an assessment to assess each student enrolled in the class. The final result of the assessment was carried out by students, then analyzed based on the standard score on a scale of 100. The final score of each student that had been assessed by his peers is shown in Figure 2 below.

![Web Development Assessment Score](image)

**Figure 2.** Graphic score of the assessment on creating web.

Based on the results of the performance assessment that involves peer students, the distribution of the scores for each given performance task is close to the normal curve. These results prove that the involvement of peers in student performance assessment gives good results. So, it can be interpreted that, the involvement of peer students in the assessment guarantees an objective assessment in accordance with the given rubric.

5. **Conclusion**

The involvement of students to assess their peers is implemented in one subject to assess the performance in creating a web using the WordPress Content Management System (CMS) individually. The web assignment was then assessed by peer students using a performance rubric that had been prepared by the lecture. Based on the results of the performance assessment in accordance with the given performance rubric, the distribution of the given performance assignment scores is close to the normal curve. These results prove that the involvement of peers in student performance assessment gives good results. Thus, it can be interpreted that the involvement of peers in the assessment guarantees an objective and transparent assessment and can be trusted to avoid the subjectivity of the teacher in the assessment of students.

**References**

[1] Uno H B and Koni S 2012 *Assessment Pembelajaran* (Jakarta: Bumi Aksara)
[2] Arikunto S 2012 *Dasar-dasar Evaluasi Pendidikan* (Jakarta: Bumi Aksara)
[3] Soetomo 1993 *Dasar-dasar Interaksi Belajar Mengajar* (Surabaya: Usaha Nasional)
[4] Koyan I W 2011 *Asesmen dalam Pendidikan* (Singaraja: Undiksha Press)
[5] Sanjaya W 2010 *Kurikulum dan Pembelajaran* (Jakarta: Kencana Prenada Media Group)
[6] Setemen K, Dewi L J E, and Purnamawan I K 2019 PAON usability testing using system usability scale *J. Phys. Conf. Ser.* 1165