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Proportion of Examinations and Assignments for Assessment in the Department of Civil Engineering, State University of Malang, Indonesia

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Abstract. This research aimed to describe the proportion of examinations and assignments for assessment in the Department of Civil Engineering. The study was descriptive ex-post facto research. The research samples consisted of 36 lecturers in charge of constructing exam questions and assignments for theory courses in the Department of Civil Engineering. Data were collected through questionnaire and then analysed using descriptive statistics. Results showed that, first, the proportion of test questions applied for assessment was considered good since the assessment procedures involved open-book examinations composed of essay questions. Second, the proportion of individual assignments was relatively good, but that of group assignments was too small. Third, the proportion of examinations to assignments was good, but that of assignments in the form of class presentations was quite small.

Keywords: assessment, examination, assignment

I. INTRODUCTION

Assessment is of crucial importance in learning. Good assessment will enhance the motivation and thinking abilities of students. Through reliable and accurate assessment procedures, students are able to prepare themselves for future emerging conditions. Experts have suggested that the 21st century assessment is the proper assessment for the present and future. The assessment of the 21st-century skills should allow students to perform real-world, collaborative, and higher-order thinking tasks [1]. The assessment methods require a set of comprehensive criteria with emphasis on skills in high-level cognitive, critical thinking, collaboration, and contextual [2].

In addition to high-order thinking skills, other skills necessary for problem solving are communication and collaboration skills. Communication is a process in which a sender transferring information to a receiver with or without the use of a medium [3]. It is simply the act of transmitting information from one person to another [4]. In other words, communication skills refer to the ability to convey information to others.

Huge problems that cannot be handled by a single individual should be resolved through collaboration. Collaboration is mutual involvement in an attempt to solve a problem [5]. Numerous researchers believe that developing the ability to collaborate requires skills such as communication, coordination, conflict resolution, decision-making, problem-solving, and negotiation [5]. Therefore, the improvement of hard and soft skills in students rely on the development of high cognitive abilities, collaboration, and communication through written examinations, group assignments, and presentations in balanced proportions.

Written examinations can be in two forms: multiple choice and essay. Multiple choice tests are less able to measure the ability to synthesise and evaluate, while essay and performance tests are appropriate for assessing the ability to solve complex real-life problems that require higher-order thinking [6]. The format of multiple choice examinations hinders the development of critical thinking, while the essay test format encourages the process of learning deeply and thinking critically [7]. The essay tests are best used to assess complex learning outcomes. The essay test items provide opportunities to compile, analyse and synthesise, and develop ideas [8].

Essay tests can be grouped into two types: open-book and take-home tests. The open-book test allows students to consult their notes, textbooks, and other materials when answering questions. This open-book test is suitable for use to develop critical and creative thinking skills [9]. This type of test is a useful way to assess students' mastery of applying theory to new situations [10]. It can encourage students to use higher levels of thinking. This open-book format can also reduce stress

and anxiety levels in students. In the open-book examination, students are given a problem to solve not just a set of questions [11]. Therefore, this format is suitable for engineering students because, in real-world engineering settings, solving problems by consulting references and other resources is permitted [12]. Notwithstanding the advantages set out above, open-book tests also have limitations [13].

In addition to the open-book test, there is another type that gives more freedom to the test takers, i.e. take-home test. A take-home examination is composed of essay questions which can be completed outside the classroom—even at home—with a longer deadline for completion. This type of examination demands higher critical and analytical thinking than in-class essay examinations.

Another form of assessment that gives students more freedom than take-home exams is assignments. Psychometric studies show that higher-order thinking skills are better assessed through performance assignments [6]. Several forms of assignments in learning are knowledge-deepening activities, conducting research and writing papers and journal articles. According to the National Accreditation Board for Higher Education (BAN-PT), the proportion of assignments for assessment in universities is at least 20% of the course assessment; it is best if the assignments in total are worth ≥ 50% [14].

This study aimed to describe the proportion of examinations and assignments for assessment in the Department of Civil Engineering, State University of Malang.

II. METHOD

The research population was the assessment forms used in the Department of Civil Engineering, State University of Malang. 36 Civil Engineering lecturers, each teaching a different theory course, were selected as samples by purposive sampling. The instruments developed in this research were a closed-ended questionnaire using a Likert scale and an open-ended questionnaire about the format of the assignments and examinations and the assessment tools used. Data were analysed using descriptive statistics.

III. RESULTS AND DISCUSSION

Proportion of Examinations for Assessment

The analysis results showed that an examination composed of essay questions was the most commonly used (83.30%); the rest, 16.70%, represents the percentage of exams consisting of a combination of essay and multiple-choice questions. This proportion indicates the use of assessment method suitable for the subjects in the Department of Civil Engineering which involve planning, calculation, drawing and application. The primary advantage of the essay examination over the multiple-choice examination is that the essay format has the potential to measure learning achievement at a higher level. Also, essay test items can give students the opportunity to develop, analyse, synthesise and develop thoughts [8].

Several types of written examinations used are closed-book, closed-book with a chance to consult one page of notes, closed-book with a chance to consult tables, open-book and take-home. These results are presented in Table 1.

Table 1. Examination Types

Examination Type	Percentage (%)
Closed-book	13.89 %
Closed-book, allowed to consult notes (1 page only)	19.44 %
Closed-book, allowed to consult tables	2.78 %
Open-book	55.56 %
Take-home	8.33 %
Total	100.00 %

The most widely used examination type was the open-book format (55.56%), followed by the closed-book format with a chance to consult one page of notes (19.44%), the closed-book format (13.89%), the take-home format (8.33%), and closed-book with a chance to consult tables (2.78%). A large proportion of open-book test type suggests that examinations administered in the Department at the Civil Engineering were of quite good quality because they were oriented to problem-solving.

According to some experts, open-book examinations indeed can exert a positive impact because students are given problems to solve, not questions to merely test memory. The open-book test type encourages students to think critically and creatively, and, ultimately, boost intelligence [11]. It is a useful tool to assess students' mastery of applying theory to new conditions. It can encourage students to use higher levels of thinking. This type of test can also reduce students' stress and anxiety [10].

Based on the results of the above analysis, the test questions applied for assessment belonged to the 'good' category since the assessment procedures frequently carried out involved open-book examinations composed of essay questions. In other words, the overall test questions made by the lecturers were satisfactory and enough to meet the needs of students for the development of critical thinking and problem-solving skills.

Proportion of Assignments for Assessment

The results of the data analysis showed that all lecturers (100%) have given assignments for individual students, but not many for groups of students. Group assignments were offered by 58.33% lecturers, while the rest (41.67% lecturers) did not give any.

Most individual assignments did not require class presentations, while group assignments were largely presented in front of the class. The average individual assignment number per semester was 3.39, 0.56 of which were presented in class. The average of group assignment number per semester was 1.58, 0.94 of which tasks presented in class (see Table 2). These results indicate that the proportion of individual assignments was good, but that of group assignments and class presentations was too small.

Table 2. Individual and Group Assignments and Class Presentations

Assignment Type	Average Number of Assignments/Semester	Average Number of Presentations/Semester
Individual Assignment	3.39	0.56
Group Assignment	1.58	0.94
Total	4.97	1.50

Coordination skills may be of little use in small-scale work. In large-scale work, however, coordination, collaboration and communication skills are essential. In addition to high-order thinking and communication skills, another skill necessary for the 21st century learning is collaboration [15, 1, 2]. In this study, we found that the proportion of group assignments and presentations was too small, even though the proportion of individual assignments was quite good.

Proportion Examinations to Assignments

Based on the results of data analysis, the proportion of examinations and assignments was 56.00% and 44.00%, respectively. As stated in the accreditation standards, the proportion of assignments for assessment in universities is at least 20% of the course assessment; it is best if the assignments in total are worth ≥ 50% [14]. It means that the proportion of exams and assignments set by lecturers was quite good—close to 50%.

The analysis results showed that out of 44.00% assignments, only 13.55% were presented in front of the class, the rest (30.45%) were not. The proportion of assignments without class presentations was 30.45%> 25%, which was considered fair. However, the proportion of assignments with class presentations was 13.55% < 25%, meaning not enough to improve collaboration and communication skills according to the 21st century competency requirements [15]. In other words, the proportion of examinations to assignments was generally good, but that of assignments in the form of class presentations was still lacking.

IV. Conclusion and Suggestion

The analysis results and discussion have led to the following conclusions. First, the proportion of test questions applied for assessment in the Department of Civil Engineering was considered good since the assessment procedures frequently carried out involved open-book examinations composed of essay questions. Second, the proportion of individual assignments was relatively good, but that of group assignments was too small. Third, the proportion of examinations to assignments was good, but that of assignments in the form of class presentations was quite small.

This research also offers several suggestions for lecturers. First, lecturers should improve the quality of the test questions by emphasising contextual problem solving in the field of civil engineering. Second, more group assignments should be offered to enhance the ability to collaborate. Third, class presentations should be promoted to improve communication skills.

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