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Standard Setting for Assessment of Basic Medical Science Modules

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Abstract

Standard setting in examination is the procedure to determine the passing score. Evidence from the literature showed that the practice of taking a 50% mark as the cut off point differentiating passes and failures is not defensible. The objective of this paper is to highlight the standard setting methodology in determining the pass or fail scores in the assessment of basic medical science module of undergraduate medical programme at the Universiti Kebangsaan Malaysia. The results showed that the cut score values varied according to the method of assessment. The multiple choice question (MCQ) cut scores generated from the standard setting exercise were consistently lower than 50% score in all modules whilst the modified essay question (MEQ) cut score were generally higher than 50%. Generally, the cut scores generated by standard setting were reasonable; however, there were also cut scores generated that were either too low or too high. We conclude that it is feasible to conduct the standard setting procedures though it is rather tedious and time consuming. However, it requires training and more practice to obtain reliable and realistic results.

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1. Introduction

Standard setting in examination is the procedure to determine the passing score; the value that differentiate the competent from the non-competent. Generally the standard can be classified as relative (norm-referenced) or absolute (criterion-referenced). The relative standards identify a group of passing and failing examinees relative to the performance of some well-defined group; the passing score or standard will depend on the performance of the specific group tested. Absolute standards are based on a predetermined level of competency that does not depend on the performance of the group (Downing et al. 2006). Absolute standards are most appropriate for high stake examinations, particularly in the medical profession where the test is to differentiate the competent from the non-competent.

The appropriate set of standards for an assessment will pass those students who are truly competent; therefore, setting an appropriate standard for an examination is critical. Ideally, it should be carried out by the content expert

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who has vast experience in dealing with different categories of students. The experience they have will enable them to differentiate not only the passes and failures, but more importantly they will be able to characterize the borderline students. The borderline students are typically students whom we are not sure whether to pass or to fail due to our uncertainty of the adequacy of their knowledge and skills in making effective clinical judgments (Searle 2000).

There are various methods of standard setting in students' assessment described in the literature. The commonly used methods are the Nedelsky's and the Modified Angoff method. The Nedelsky's method is used to estimate the cut score of objective questions such as MCQ, for example one best answer (OBA) and extended matching question (EMQ). In this method the judges go through the questions and identify and eliminate the answers that a borderline student would be able to recognize as wrong (Zieky and Perie 2006). The total score for the test is obtained by addition of the scores for each item. The judges mark for each item of MCQ, that a minimally competent person should be able to eliminate from consideration in selecting the correct response; assuming that the minimally competent student would then have an equal chance of guessing the correct answer from the remaining options. For example, if two choices within a question of five-item multiple choices were eliminated, the reciprocal of the three remaining choices would be one third which is called the Nedelsky value. The average of all of the judges' scores over all of the items within the module question paper give rise to the probable standard or cut score of a minimally qualified candidate.

The Modified Angoff method (Angoff 1971) of standard setting addresses the issues of the borderline students. It is used to estimate the standard or cut score of passing in subjective questions such as MEQ and objective structured practical examination (OSPE). In this method all judges were provided with the answer scheme of each question. The judges read each question assigned to them and set a score to each section of question corresponding to the borderline student's expected response. The total score from each judge became the score that a borderline student might get. The mean score of all the judges' scores of a particular question becomes the minimally acceptable borderline score for that question. The sum borderline scores for all the questions become the standard passing score.

The objective of this paper is to highlight the standard setting methodology in determining the pass or fail scores in the assessment of basic medical sciences modules of the first semester of year 1 in the Universiti Kebangsaan Malaysia (UKM) undergraduate medical program.

2. Methodology

There are 4 basic sciences modules taught and assessed during the first semester of year 1 UKM undergraduate medical program. The modules are cellular biomolecules, tissues of the body, membrane and receptors, and human genetics. There are 200 UKM students enrolled every year and there are four basic sciences modules taught in each semester. Each of these modules is assessed through an end-module examination and end-semester examination at the end of semester using multiple choice questions (MCQ) of one best answer (OBA) type and extended matching question (EMQ) type, modified essay question (MEQ) and objective structured practical examination (OSPE). The students are also assessed based on their performance in problem-based learning (PBL) in each module. There are 3 to 4 problem based learning cases conducted in each module.

The weightage of end-module examination, PBL performance and end-semester examination were 20%, 10% and 70% respectively. In this paper reported all of the four modules conducted in semester 1 of the curriculum namely Cellular Biomolecules, Tissues of Body, Membrane and Receptors and Human Genetics. The cut score of all semester 1 module of 2009-2010 academic sessions were studied. The Nedelsky's and Modified Angoff method of standard setting were used to set the standard and the results were analysed. The judges were selected by head of module and from those involved in the teaching of that particular module. Usually 5 to 7 judges were involved for each module.

3. Results

Table 1 shows the different assessment component, weightage and number of various questions used for the assessment of basic medical sciences modules. Evaluation during PBL session and end of module test contribute to 30% of continuous assessment. The assessment blue print of each module was determined at the beginning of each semester. The number of questions for each method of assessment are shown in the table below.