

Original Article**Effectiveness of Kathmandu University School of Medical Sciences Medical Evaluation Scheme****Dil Islam Mansur^{*}, Pragma Shrestha, Sunima Maskey, Sheprala Shrestha, Dilip Kumar Mehta**

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Article Received: 10th December, 2023; Accepted: 18th March, 2024; Published: 30th June, 2024**DOI: <https://doi.org/10.3126/jonmc.v13i1.68113>****Abstract****Background**

Evaluation analyzes the learning capabilities and check the knowledge and skills that students have gained during study period. Good evaluation scheme is a key issue in medical education. Evaluation scheme, currently in use, are reviewed with attention for their strength and weaknesses. The purpose of the present study was to determine perception of medical students regarding effectiveness of Kathmandu University School of Medical Sciences (KUSMS) medical evaluation scheme which may enhance the competency of the medical students as well as quality of medical education.

Materials and Methods

This study was cross sectional questionnaire based study which consisted of 250 (165 male and 85 female) medical students who have already appeared in university examination. A Google Form Questionnaire was generated and shared to the student in order to acquire their perception regarding KUSMS medical evaluation scheme. Data was collected and statistical analysis was done.


Results

Majority of the participants had shown their strongly agreement that KUSMS medical evaluation scheme is one of the best tool which help them to support in improving their learning skills and in obtaining good mark in their examination. Most of them also agreed that formative assessments give them the best opportunity to improve the weakness in their studies. Similarly, they preferred more integrated pattern of examination (current) rather than discipline based (subject wise) examination.

Conclusion

The assessment methods should match the competencies being learnt and the teaching methods being used. Several assessment methods are used longitudinally to assess the student's learning needs and to identify optimal performance by the faculties.

Keywords: *Assessment, Curriculum, Medical students, Questionnaire*

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Introduction

In recent years, there is a big issue for medical educationists to evaluate the teaching and learning outcomes of medical curriculum. There is also challenge to examiners to assess knowledge and skills of medical students learnt during their academic year [1]. The mainstream of teaching and learning activities has become more scientific, rigorous, problem based and self-directed learning. The role of medical faculties has progressed to solution giver rather a problem identifier [1, 2].

Medical schools are facing different challenges from patients, communities, doctors and students. To overcome this, development of new curriculum, professional development of faculties, introduction of new learning methodology and new methods of assessment are accomplished [2]. KUSMS evaluation scheme is maintaining its quality of professional competency among medical educational with various modes of assessments [4]. However, evaluation scheme always needs additional enhancement for better preparation of medical students as a clinical practitioner [4, 5].

The present study was aimed to study on perception of the medical students on effectiveness of KUSMS medical evaluation scheme. This may provide constructive feedback to the authority about their evaluation scheme, subsequently enhance competency of the medical students and improve the quality of medical education.

Materials and Methods

This study was cross sectional questionnaire based study conducted among all the medical students from second, third (new), third (old), final years and interns who have already appeared in Kathmandu university examination. This study was conducted at KUSMS, Chaukot, Kavre, Nepal during the period from 1st May to 31st July 2023. Prior to the beginning of the study, ethical clearance was taken from IRC-KUSMS approval No. 51/23.

A Google Form Questionnaire was developed after comprehensive literature review and provided to the students in order to acquire their perception about teaching and learning anatomy. A pilot study was done and the questionnaire was pre-tested among 10% of the students. Cronbach's alpha was used to test the reliability of the test items and the value of alpha was

obtained as 0.9 which indicate the high level of internal consistency of the scale.

Participation in the study was voluntary and an informed consent was taken from all the participants before sending the Google Form to all level of the medical students. All the participants were counselled and explained about the objective of the study. Students unwilling to participate were excluded from the study. Convenience sampling was used. The sample size was calculated as: $n = Z^2 \times p \times q / e^2 = (1.96)^2 \times (0.5) \times (0.5) / (0.05)^2 = 384.16$, Where, n = minimum required sample size, $Z= 1.96$ at 95% Confidence Interval (CI), p = past prevalence (0.5), $q= 1-p$, e = margin of error, 5%. The sample size obtained was 384.16 and the study was conducted on 400 medical students.

A Google Form Questionnaire was generated and shared to the student in order to acquire their perception regarding effectiveness of KUSMS medical evaluation scheme. Students' degree of agreement was recorded according to the Likert scale in five values with Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD). Data was collected and statistical analysis was done using SPSS 16.0. Descriptive analysis was used and tabulated by means and percentage.

Results

Among 400 medical students of KUSMS, a total of 250 (62.5%) students were participated; out of that 165 (66%) were male and 85 (34%) were female who had participated in the Google Form Questionnaire survey. The medical students enrolled in different years were involved which is shown in table 1. The responses which were submitted by individual participant were collected and the findings are illustrated in table 2. In the current study, different interesting findings emerged as the students proposed various ways to integrate them into KUSMS medical evaluation scheme to enhance the comprehensibility of medical course.

Table 1: Participants/ Students from different years

Participants / Students	Number (Percentage)
Second Year	83 (33.2%)
Third Year(New)	57 (22.8%)
Third Year (Old)	54 (21.6%)
Final Year	34 (13.6%)
Internship	22 (8.8%)



Table 2: Responses for perceptions of medical students regarding KUSMS evaluation scheme

Questionnaire	SA	A	N	D	SD
I think KUSMS evaluation scheme enhances the learning capabilities and test the knowledge and skills that I have acquired during my academic courses.	35 (14.1%)	139 (55.8%)	48 (19.3%)	19 (7.6%)	8 (3.2%)
KUSMS evaluation scheme is one of the best tools which help me to support in improving my learning skills and in obtaining good mark in exams.	27 (10.9%)	112 (45.2%)	71 (28.6%)	26 (10.5%)	12 (4.8%)
I think, internal examinations give me the best opportunity to improve the weakness in my studies.	87 (35.1%)	117 (47.2%)	27 (10.9%)	14 (5.6%)	3 (1.2%)
In my opinion, MCQ is very much easier to score good marks in examination.	44 (17.7%)	92 (37.1%)	63 (25.4%)	32 (12.9%)	17 (6.9%)
I think, MCQ is effective in assessing students learning abilities in related subject.	85 (34.2%)	125 (50.2%)	20 (8%)	14 (5.6%)	5 (2%)
I think studying only for MCQ which may help me to pass theory exam.	8 (3.2%)	25 (10.1%)	60 (24.2%)	111 (44.8%)	44 (17.7%)
By preparing only for SAQ, it helps me to pass theory exam.	5 (2%)	47 (18.8%)	49 (19.7%)	114 (45.8%)	34 (13.7%)
I prepare only for PBQ to pass theory exam.	00	3 (1.4%)	21 (8.5%)	149 (59.9%)	75 (30.2%)
I prepare for all components (MCQ, SAQ and PBQ) of theory paper to pass theory exam.	99 (39.8%)	120 (48.2%)	17 (6.8%)	10 (4%)	3 (1.2%)
I prefer integrated pattern of examination (current) rather than discipline based (subject wise) examination.	112 (45.2%)	89 (35.9%)	31 (12.5%)	6 (2.4%)	10 (4%)
SAQ provides me chance to think significantly and efficiently about the subject contents.	25 (10.1%)	159 (64.4%)	43 (17.4%)	14 (5.7%)	6 (2.4%)
PBQ gives me opportunity to think critically and effectively about the course contents.	61 (24.5%)	148 (59.5%)	27 (10.8%)	7 (2.8%)	6 (2.4%)
I usually find there is a good correlation between case scenarios and given question in PBQ.	33 (13.3%)	141 (56.9%)	44 (17.7%)	21 (8.5%)	9 (3.6%)
I really feel good to express my views in PBQ.	36 (14.6%)	145 (58.7%)	48 (19.4%)	11 (4.5%)	7 (2.8%)
In my opinion, practical/spotter examinations assess the real students' knowledge and skills what they have gained during practical classes.	40 (16.1%)	120 (48.2%)	45 (18.1%)	31 (12.4%)	13 (5.2%)
I think Viva-Voce is the best tool to assess competently knowledge and performance of the students.	29 (11.6%)	90 (36.2%)	53 (21.3%)	48 (19.3%)	29 (11.6%)
I think combination of practical/spotting examinations and Viva-voce is the best tool for evaluation of students.	53 (21.5%)	119 (48.2%)	48 (19.4%)	15 (6.1%)	12 (4.8%)
In my opinion, Viva-Voce is the commonest tool to provoke stress and anxiety.	96 (38.7%)	93 (37.5%)	35 (14.1%)	17 (6.9%)	7 (2.8%)

(Note: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree)

KUSMS medical evaluation scheme

On the basis of student's responses, it was concluded that most of them 139 (55.8%) agreed and 35 (14.1%) students strongly agreed that KUSMS medical evaluation scheme enhances the learning capabilities and test the knowledge and skills that they have acquired during their

academic courses. Similarly, the majority of the participants 112 (45.2%) had shown their concurrence and 27 (10.9%) participants viewed strongly agreement that KUSMS medical evaluation scheme is one of the best tool which help them to support in improving their learning skills and in obtaining good mark in their examination as shown in table 2.

Formative assessment

Most of the participants 117 (47.2%) agreed and 87 (35.1%) strongly agreed that formative assessments give them the best opportunity to improve the weakness in their studies as shown in table 2.

Multiple Choice Questions (MCQ)

Most of the students believed that MCQ are valuable tool for assessing learning abilities in a particular subject to achieve good marks. However, most of them disagreed that focusing only for MCQ would be sufficient to pass theory examination shown in table 2.

Short Answer Question (SAQ)

Even though the most of the students 159 (64.4%) agreed that SAQ provides them chance to think significantly and efficiently about the subject contents. Whereas the majority of them 114 (45.8%) disagreed that by preparing only for SAQ which helps them to pass theory examination as shown in table 2.

Problem Based Question (PBQ)

Most of the students 141 (56.9%) usually find there is a good correlation between case scenarios and given question in PBQ. Similarly the most of students 148 (59.4%) agreed as well as 61 (24.5%) strongly agreed that PBQ gives them opportunity to think critically and effectively about the course contents. Similarly they really feel good to express their views in PBQ which is opined by most of the students 145 (58.7%) in this study. However, they don't prepare only for PBQ to pass their theory examination which is revealed from their responses as illustrated in table 2.

Integrated pattern

The majority of the participants 112 (45.2%) strongly agreed and 89 (35.9%) agreed that they prefer integrated pattern of examination (current) rather than discipline based (subject wise) examination. Similarly, most of the students 120 (48.2%) agreed and 99 (39.8%) of the students strongly agreed that they prepare for all compo-



nents (MCQ, SAQ and PBQ) of theory examination as shown in table 2.

Practical/spotter

The majority of the respondents 120 (48.2%) agreed and 40 (16.1%) respondents strongly agreed that practical/spotter examinations assess the real students' knowledge and skills what they have gained during practical classes as illustrated in table 2.

Viva-Voce

The majority of the participants 90 (36.1%) agreed that viva-voce is the best tool to assess competently knowledge and performance of the students. However, 48 (19.3%) participants disagreed and 53 (21.3%) participants were opined as neutral view on this regards as shown in table 2.

The combination of practical/spotting examinations and viva-voce is the best tool for evaluation of students which were agreed by 119 (48.2%) students as well as 53 (21.5%) students strongly agreed. In their opinion, viva-voce is the commonest tool to provoke stress and anxiety which was strongly agreed by 96 (38.7%) students and agreed by 93 (37.5%) students as illustrated in table 2.

Discussion

It is very essential to highlight the academic need of reviewing the teaching and learning activities from time to time and making satisfactory modifications, to enhance teaching and learning skills. As an academician, actively involved in evaluation process, believed that evaluation has an important influence on students' learning. The way in which a student thinks about learning and studying, determines the way in which the students tackle evaluation tasks. On the other hand, the learner's experience of evaluation determines the way in which the students approach learning. Thus evaluation is one of the important features of students' learning [6]. The concept of evaluation drives learning process is established as one of the major pillars of high-quality assessment practice [7] which is also agreed by the majority of the participant in the current study. The majority of participants in this study felt that explanation of each tool of KUSMS evaluation scheme in early part of medical course that may improve their performance during their examinations.

KUSMS Medical Evaluation Scheme

There is various assessment methods used to

cover almost all aspects of clinical competency of the medical students and no any single assessment method is adequate for evaluating the students' attitude, concepts, knowledge, skills and competency. For concept, knowledge, and its application (Knows and Knows How) context-based MCQ, comprehensive matching item and SAQ are suitable. For shows how, multi-station OSCE is possible. For performance-based assessment (Does), Mini Clinical Evaluation Exercise (mini-CEX), Directly Observed Procedural Skills (DOPS) is appropriate. Alternatively clinical work sampling and portfolio or log book may be appreciated [8] which is consistent with KUSMS medical evaluation scheme. It consists of formative and summative assessments in which they comprise written theory examination, practical examination and viva-voce.

Formative assessment

It offers benefit through familiarizing the students with the levels of learning required, informing them about gaps in their learning and providing feedback [9]. In current study, the most of the participants strongly agreed that internal assessments give them the best opportunity to improve the weakness in their studies which agrees with the results from Riyadh, Saudi Arabia [7]. It also helps the students to prepare better for summative examinations. Therefore, frequency of formative assessment should be more that may improve their performance.

Multiple Choice Questions (MCQ)

These are the most frequently used question type in which students are required to select the single best answer from usually four distracters. These types of questions are comparatively easy to construct and due to their broad content domain they have high reliability for testing. This hypothesis is not correct that MCQ is unsuitable for assessing problem solving ability because they require students to simply be familiar with the correct answer, while they have to create the answer in open ended questions [10]. Appropriately constructed MCQ can evaluate the application of knowledge and problem solving skills [11]. Contextualising the questions by including clinical or laboratory case scenarios are made more authentic and reliable. There are more likely that the students will emphasis on important information rather than details. Moreover, more complex thought process is involved in which the students are analyzing different information when making a decision [10, 11]. This does not exclude the importance of other ques-



tion formats which are more suitable than MCQ for asking certain types questions. For example, an essay question will be more suitable than an MCQ when an explanation is required [12]. Most of the students in the current study have felt that MCQ is effective in assessing students learning abilities in related subject and it is very much easier to score good marks in examination. However, most of them disagreed that studying only for MCQ may help them to pass theory examination.

Short Answer Questions (SAQ)

It is semi-structured, open ended question format which can incorporate clinical cases. These questions require the students to make an answer of not more than one, two or few words, rather than to select from a fixed number of options. Many SAQ cannot be asked in an hour of testing time because they require time to answer. This limited SAQ leads to a smaller amount of reliable tests however SAQ has a better coverage of course contents as compared to long essay questions (LEQ). Moreover, the equal or higher test reliabilities can be achieved with fewer short essay questions (SEQ) as compared to true/false items. If a large amount of knowledge is required to be tested, then MCQ should be used. It is very important that the questions should be phrased unambiguously, and a well-defined answer key is written before marking these questions [11]. A structured predetermined marking scheme is essential to improve the objectivity of SAQ. However, their requirement to be marked by a content expert makes them more costly and time consuming; therefore, they should only be used when closed formats are excluded. In case of the availability of multiple examiners, double marking is preferred and more reliable. For more efficiency and reliability, each marker should assess the same question for all candidates which leads to more reliable scores than if each marker assesses all the questions of one group of students while another marker assesses all questions for another group [10, 12]. A similar format is also known as Modified Essay Question (MEQ) or Constructed Response Question (CRQ) can be used [11]. Even though most of the students agreed that SAQ provides them chance to think significantly and efficiently about the subject contents in the present study. However, the majority of them don't prepare for SAQ to pass theory examination.

Problem Based Questions (PBQ)

This is a special type of essay questions which consists of a clinical case summary followed by a series of questions related to the clinical case and that must be answered in the sequence asked. This leads to question interdependency, if a student answer the first question wrongly is most probable to answer wrongly the subsequent questions. Therefore, in this assessment tool no review or possibility of correcting previous answers is allowed, and the clinical case is reformulated as the reporting process progresses [13]. A well-written PBQ assesses the approach of students to problem solving, understanding of concept, their reasoning skills, rather than recall of factual knowledge [11]. Due to psychometric problems associated with question interdependency, it is not being used commonly for assessment and replaced by the key feature questions [10, 11, 13]. This consistent with the present study in which the most of students strongly agreed that PBQ gives them opportunity to think critically and effectively about the course contents. Similarly, they really feel good to express their views in PBQ which is opined by most of the students in this study. However, they don't prepare only for PBQ to pass their theory examination.

Integrated pattern

There is not any single method perfect to assess the knowledge of the students. Therefore, there is an integrated method or combination of two or more tools used to assess the concept, knowledge and skills which include MCQ, SAQ, PBQ, LEQ, SEQ, MEQ and problem-solving questions. Some of the studies have also claimed that no single method of evaluation is superior to another and possibly a reliable and valid evaluation needs a combination of these assessment tools [14, 15] which is also supported by the views of the respondents of this study. The present study also revealed that most of the participants are strongly agreed that they prefer integrated pattern of examination (current) rather than discipline based (subject wise) examination. In another question, they also responded that the majority of them prepare all components (MCQ, SAQ and PBQ) of theory paper to pass theory university examination.

Practical/spotter examination

It is usually divided into two groups such as assessment of performance in vitro which includes in standardized or simulated conditions



and assessment of performance in vivo which includes in real life conditions. Both group involves demonstration of a behaviour or skill continuously or at a fixed point in time by a student; and observation and marking of that demonstration by the faculty members. Various tools can be used which comprise of rating scales, checklists, structured and unstructured reports. The combination of tools can be used to note observations and to help in the assessment or scoring of such demonstrations. Checklists or rating scales are prepared and used as scoring tools in different forms of examinations which may include Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examinations (OSPE) and Direct Observation of Procedural Skills (DOPS), peer assessment, self assessment and the patient's history [16]. The assessment of real performance is that what the doctors do in their real practice like as clinical competence, which is the ultimate goal for a valid assessment. The validity of this assessment is excellent but has problems of inadequate reliability which is due to lack of standardization, limited sampling of skills and limited observations. This is a major cause of concern which limits their use as summative or qualifying examinations. To overcome this issue, assessments in simulated settings which mimic the real conditions should be designed to assess performance such as Objective Structured Clinical Examination (OSCE) or Objective Structured Practical Examinations (OSPE) [17]. Similarly, the present study also revealed that these type examinations assess the real students' knowledge and skills what they have gained during their practical classes which is agreed by the majority of the respondents in the present study.

Viva-Voce

This type of examination is also commonly used for the students' evaluation. Different studies show that the oral examination/viva has poor content's validity, higher inter-rater variability and inconsistency in grading. This type of assessment tool is very much vulnerable to biasness and inherently unreliable. Its validity and reliability could be encouraged by making it more structured and objective [18]. Similarly, the majority of the participants agreed that viva-voce is the best tool to assess concepts, attitude, knowledge and skills of the students in the present study. However, 19.3% of the participants disagreed and 21.3% of the participants opined as neutral view on this regards. The

combination of practical/spotting examinations and viva-voce is the best tool for evaluation of students which was agreed by majority of the students. Moreover, they also opined that viva-voce is the commonest tool to provoke stress and anxiety.

Log/practical book

Log/practical or record books are commonly used in training evaluation or by the clinicians for their personal record. In the logbook students or a clinician can keep a record of the patients seen or procedures performed either electronically or in a book. It maintains the records of the patient's treatment, patient care, complications and learning experiences. It is very useful in focusing students on important objectives that must be fulfilled within a specified period of time. It usually makes easy and examines students learning, gives a suggestive feedback for the evaluation of learning activities and authenticate the procedural experience [19, 20] which is also supported by the respondents of this study.

The present study was conducted in only one medical institution which was included only the medical students and. Therefore, one of the limitations of this study was the limited sample size. Therefore, the results of this study could not be generalized. For generalizations, this type of study should be done in all affiliated medical colleges under Kathmandu University which may give more reliable data about KUSMS medical evaluation scheme. Moreover, even with these limitations, the implications of these results become visible to be pertinent as it is matching with previous studies in the same domain.

Conclusion

Most of the medical students preferred all components of KUSMS medical evaluation scheme because no any single evaluation method is perfect to assess the students' attitude, concepts, knowledge, skills and competency. Hence, an integrated method or combination of two or more tools used to fulfil the aims and objectives of the institution. Good quality assessment not only satisfies the requirements of accreditation but also contributes to the student's teaching and learning activities.

Recommendation

As the students are the most important stakeholders in any institution, they should have given priority to seek information and feedback to support their teaching and learning activities. The faculties should always be conscious to use the



several assessment tools effectively in the development of good assessment methods in order to enhance teaching and learning skills; and keep the students occupied. Understanding student perceptions of the various assessment methods and the impact this has on their learning could help faculties and institution to develop assessment tools, which could address the student's requirements, while at the same time fulfilling the context and; aims and objective of assessment in medical education.

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