

Research article

Analysis of Forensic Medicine questions in the undergraduate medical curriculum of the University of Peradeniya , Sri Lanka

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Forensic Medicine is a subject in the undergraduate medical curriculum in Sri Lanka. Several evaluations comprising of essay and structured essay types of questions are used for the evaluation of students. Since recent trends in medical education stresses the importance of promoting higher order thinking, such as analyzing and evaluating, rather than just remembering facts it was decided to conduct a study with a view to determining the cognitive level of the essay and structured essay type of questions in Forensic Medicine

Method

Essay and structured essay types of questions of the first four years of the MBBS program from the year 2006 to 2012 were categorized according to the Bloom's taxonomy.

Results

A majority of questions were knowledge based while a considerable number were of the comprehension and application types. The proportion of questions of the synthesis and analysis were less while there was a moderate number of the evaluation type of questions. Observations made between the years revealed that there was a tendency for a decrease in the proportion of knowledge-based questions from the 1st year to the 4th years with an increase in the proportion of synthesis type of questions.

Conclusion

A majority of questions in Forensic medicine require lower cognitive abilities. However, there is a tendency towards questions, which require higher cognitive abilities with progression in to the senior years of the medical course.

Key words: Forensic Medicine questions , Medical curriculum, Bloom's taxonomy

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Introduction

Forensic Medicine is a subject in the undergraduate medical curriculum in Sri Lanka. In the Faculty of Medicine, University of Peradeniya, the subject Forensic Medicine is a component in a stream known as the Doctor in Society, which extends throughout the first four years of the MBBS curriculum. This is a 105 hr. course where the learning objectives have been clearly identified and documented.

Even though written examinations are considered to be a conventional method it is a universal tool and is used to evaluate student learning in Forensic medicine, at the university of Peradeniya, at the end of the first year, end of the first and second semesters of the second year, end of the first and second semesters of the third year and end of the first and second semester of the fourth year by structured essay, essay and multiple choice questions. In spite of the fact that assessment is known to drive learning whether or not written examinations are able to assess the level of the student's cognitive ability is dependent on the type of questions constructed (1). Hence, assessment will determine not only the way in which we teach and what we teach but also what and how the students learn. Therefore, it is necessary not only that learning objectives and assessment are aligned with each other but also that assessment indicates the significance and the effectiveness of learning experience to achieve the desired goal.

Furthermore, recent trends in medical education stresses the importance of promoting higher order thinking, such as analyzing and evaluating, rather than just remembering facts. Therefore, in order to promote higher order thinking among students it is important that the objectives and the examination questions be constructed towards this goal. Bloom's Taxonomy, which is a hierarchical classification of learning objectives, designed to verify a student's cognitive level was considered a useful tool for the purpose of this study (2). This method classifies objectives as related to the following domains; Knowledge (Recall data or information), Comprehension (Understand the meaning, translation, interpolation, and

interpretation of instructions and problems), Application (Use a concept in a new situation), Analysis (Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences), Synthesis (Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure), Evaluation (Make judgments about the value of ideas or materials). It was considered that the same categorization may be used in the classification of examination questions.

This study was conducted with a view to determining to what extent structured essay and essay questions promoted deep learning in Forensic Medicine

Methods

The examination questions in Forensic Medicine of the first four years of the MBBS program from the year 2006 to 2012 were used for the analysis. The questions varied from Essay to structured essay types. Each examination question was independently rated by 3 authors according to the Bloom's taxonomy. Where ever a discrepancy was observed consensus was arrived at by discussion among the raters.

Results

A majority (32.6%) of questions were knowledge based while a significant number were of the comprehension (21.9%) and application (22.3%) types. The proportion of questions of the synthesis (8.2%) and analysis (4.7%) were less while there was a moderate number (10.3%) of the evaluation type of questions (Table 1).

Observations made between the years revealed that there was a tendency for a decrease in the proportion of knowledge based questions from the first to the 4th years with an increase in the proportion of synthesis type of questions.

Discussion

The results revealed that a majority of questions in Forensic medicine require lower cognitive abilities such

Table 1: The number of questions in each category of the Blooms taxonomy

	Y1S2	Y2S1	Y2S2	Y2	Y3S1	Y3S2	Y3	Y4S1	Y4S2	Y4	Total
Knowledge	17 (41.5)	2 (20)	12 (38.7)	14 (34.1)	15 (32.6)	12 (30.8)	27 (31.8)	11 (28.2)	7 (25.9)	18 (27.3)	76 (32.6)
Comprehension	10 (24.4)	1 (10)	7 (22.6)	8 (19.5)	6 (13.0)	6 (15.4)	12 (14.1)	15 (38.5)	6 (22.2)	21 (31.8)	51 (21.9)
Application	4 (9.8)	4 (40)	5 (16.1)	9 (22)	15 (32.6)	9 (23.1)	24 (28.2)	9 (23.1)	6 (22.2)	15 (22.7)	52 (22.3)
Analysis	4 (9.8)	0	1 (3.2)	1 (2.4)	4 (8.7)	0	4 (4.7)	1 (2.6)	1 (3.7)	2 (3.0)	11 (4.7)
Synthesis	2 (4.9)	1 (10)	1 (3.2)	2 (4.9)	3 (6.5)	5 (12.8)	8 (9.4)	3 (7.7)	4 (14.8)	7 (10.6)	19 (8.2)
Evaluation	4 (9.8)	2 (20)	5 (16.1)	7 (17.1)	3 (6.5)	7 (18.0)	10 (11.8)	0	3 (11.1)	3 (4.5)	24 (10.3)
Total number of questions	41	10	31	41	46	39	85	39	27	66	233

Y-Year, S-Semester

as recall, comprehension and application.

Several reasons may be hypothesized for this trend. Poor English language competence of students resulting in inability express complex phenomena has been identified by many as an important reason. The fact that there is a tendency towards questions which require higher cognitive abilities with progression in to the senior years of the medical course may support this view, since it is believed that the English language competence improves with seniority. Furthermore the fact that there is an increase in the number of students per intake and the large number of scripts to correct may result in teachers including questions which are easier to correct but may not require critical thinking techniques. Underestimating student capabilities and difficulties encountered by teachers in adapting to new educational trends maybe other factors responsible for this situation.

In this study the Blooms taxonomy has been used to categorize questions according to their cognitive level. However it must be stated that simply reading the questions did not always give a clear indication of the cognitive skill involved in addressing the question. Therefore determining the appropriate category according to the Blooms taxonomy was challenging. Even though automated systems are available for this purpose the difficulties encountered were overcome by the categorisation being done by three independent reviewers. Furthermore it is acknowledged that the action verb alone is not an indicator of the cognitive process at examinations, since whether they go through the required cognitive process is determined by the requirements of the examiner during the process of marking the question. Even though the categorization of questions was based on the Blooms taxonomy, it was recognized that the actual cognitive process that is applied to a specific task will depend on the individual solving that task. A given task

might require nothing more than recall (the lowest level of cognitive process) for one individual, but may require another individual to generate a new solution to a situation that they find novel (using the highest level of cognitive process). Furthermore it was felt that the perception of students on what is expected from them by the examiner is critical for assessing the level of process that we think most students will require in order to answer a given question. (3)

It is necessary to inspect closely the learning objectives of the Forensic medicine program to identify the cognitive level at which the objectives have been stated in order to determine whether there is mal-alignment between objectives and assessment.

Conclusions

A majority of questions in Forensic medicine require lower cognitive abilities. However, there is a tendency towards questions which require higher cognitive abilities with progression in to the senior years of the medical course.

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Competing Interests

None

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