

# Pattern of Anatomy SAQ in First Professional MBBS Examination Question Papers in Public Universities of Bangladesh

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## Abstract

**Background:** Assessment is a very important method of measurement for medical education. Anatomy is an essential part of undergraduate medical curriculum. Short answer question (SAQ) has a better content coverage as compared to long essay question.

**Objective:** To assess the Pattern of Anatomy SAQ in First Professional MBBS Examination Question Papers in Public Universities of Bangladesh.

**Methods:** The cross-sectional study was conducted at Armed Forces Medical College in the department of Anatomy, Dhaka Cantonment. For this study, SAQ papers of anatomy of nine first professional MBBS examinations of Bangladesh University of Professionals (BUP), Dhaka University (DU) and Chittagong University (CU) from May 2017 to May 2021 were collected. These were classified as parts and segments. Each segment was categorized as definition, draw and label, unique and open type. They were calculated as number of segments as well as total weightage.

**Results:** On analysis it was found that the percentage of weightage of definition type questions of BUP, DU and CU were  $3.53 \pm 2.03$ ,  $2.43 \pm 1.42$  and  $2.89 \pm 1.12$ ; draw and label type  $12.84 \pm 4.44$ ,  $15.98 \pm 3.13$ ,  $17.053 \pm 0.65$ ; unique type  $24.16 \pm 9.88$ ,  $31.33 \pm 6.14$ ,  $26.47 \pm 3.84$  and for open type  $56.13 \pm 4.77$ ,  $60.72 \pm 5.15$ ,  $53.73 \pm 5.29$ . Significant difference was found in draw and label type question in between BUP and CU, in unique type question in between BUP and DU and DU and CU, in open type question in between DU and CU.

**Conclusion:** Different types of SAQ are used to determine the level of cognitive domain. Proper distribution of types of SAQ shall ensure the proportion of these domain mentioned in the curriculum.

**Keywords:** Pattern, SAQ (Short answer question), Anatomy, MCQ (Multiple Choice Questions), MBBS, Curriculum.

## Introduction

Assessment is an educational tool to evaluate students and to understand how successfully the learning materials are delivered to the learners.<sup>1</sup> Assessments have three main goals: to optimize the capabilities of all learners and practitioners by providing motivation and direction for future learning, to protect the public by identifying incompetent physicians and to provide a basis for choosing applicants for advanced training.<sup>2</sup> Assessment and proper feedback not only assist learning, it is also essential component of curriculum development. Medicine is a profession in which accurate and responsible measurement is a cardinal requirement.<sup>3</sup> Assessment is a single powerful tool that drives learners to learning. A poorly-designed assessment leads to deterioration of the learning outcomes. Assessments of anatomy promote deep learning that is crucial for students to prepare for clinical practices.

Realizing the importance of anatomy knowledge to the competency development of medical graduates, more emphasis has now been given to improve the anatomy assessment by anatomists and medical educationists over the last decade.<sup>4</sup> In 1st Professional MBBS Examination: marks distribution of assessment of Anatomy- total marks – 500, written=200 (formative 20+MCQ 40+SAQ 140), SOE=150, practical=150.<sup>5</sup> There are three domains in education- cognitive, affective and psychomotor.<sup>6</sup> Short Answer Questions (SAQs) in Anatomy are objective type of questions which require answer in words or in shorter manner. SAQs are useful in measuring learning outcomes in the lower and middle level cognitive domain like knowledge comprehension, application and analysis. Therefore, in a medical curriculum the SAQs become a helpful tool to test students learning outcome.<sup>7</sup> It is a worldwide common belief that anatomy must be taught and learnt in such a way that it become clinically meaningful and is linked to the proficiency mandatory for new medical graduates.<sup>8</sup> Anatomy is an essential part of undergraduate medical education. Teaching-learning and assessment of Anatomy has gone through remarkable changes in recent years in developed countries and also

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in Bangladesh. In this situation, a thorough understanding is required to know how different aspects of Anatomy are distributed in terms of weightage in the written assessment of Anatomy course.<sup>9</sup> SAQ has several advantages that make them attractive for both the examiners and the students. SAQ can be used to cover broader content areas by asking several discrete and important questions about the topic and thereby improve the content validity. The scoring can also be easier and better as the answers are specific and short. The reliability is improved with standard predetermined answers for each question set by the examiner.<sup>10</sup> SAQ may be of different types based on their format (structure). They include (Sood et al. 1995, p.18): completion type (fill-in-the gap type), definition type, draw and label diagram type, numerical answer type, unique answer, 'open'-ended and problem-based SAQ.

In Bangladesh, the most used SAQs in medical education are the definition type, draw and label diagram type, unique answer, open-ended and problem-based SAQs. Completion type and numerical answer type SAQs are not usually used in the medical written examinations of Bangladesh.<sup>11</sup> By using these types of SAQs we can measure learning outcomes in the lower and middle level cognitive domain like knowledge, understanding and application. According to BMDC curriculum 2021 distribution of these domains in the SAQ papers have to about knowledge 50%, understanding 35% and application 15%.<sup>12</sup>

**Materials and Methods**

This study was conducted in the Department of Anatomy at Armed Forces Medical College, Dhaka. Anatomy question papers of nine first professional examinations of BUP, DU and CU were collected. The question papers were from May 2017 to May 2021. Each question paper (test) was fully scrutinized. The numbered components (1a, 1b, 2a, 2b, etc) were identified as part and each item present in that were identified as segment Each professional examination had two papers and each paper had 7 questions each with 7 marks. So total marks for each professional examination

was 196 (paper I= 7x7+7x7 + paper II= 7x7+7x7). Each segment of questions was identified as definition, draw and label diagram, unique answer, open'-ended type SAQ on the basis of their nature. The total number and weightage of each type of question was calculated and saved as data. The data were analyzed using computer based statistical programme SPSS v23. Data were expressed as percentage (%) and frequency as appropriate. Appropriate statistical test was performed to evaluate statistical difference between groups as applicable. A p<0.05 was taken as level of significance.

**Operational Definitions**

**Teacher:** The teacher means Assistant professor & above of the department of Anatomy of the medical colleges/institute.

**Question papers:** A complete question paper of the SAQ used as Paper I / Paper II will be named as Question paper.

**Item:** The term 'item' denotes each numbered question asked in the question papers. So there are total fourteen (seven in each group) items of each question paper.

**Part:** The term 'part' denotes each separate sentence in each short answer questions (SAQ).

**Segment:** The term 'segment' indicates each component of a 'part' of an SAQ that calls for a different answer from the examinee.<sup>9</sup>

**Results**

The distribution of definition type of questions included in first professional examination of various years is shown in Table-I, separately showing the number of segments and weightage of questions. The mean percentage of weightage of definition type questions of BUP, DU and CU are 3.53±2.03, 2.43±1.42 and 2.89±1.12. There were no significant difference in between weightage of definition type of questions of BUP, DU and CU.

**Table-I:** Distribution of definition type questions

Examination	BUP		DU		CU	
	Number(%)	Weightage(%)	Number(%)	Weightage(%)	Number(%)	Weightage(%)
May 2017	5(7.21)	12(6.12)	4(6.25)	8(4.08)	5(5.81)	9(4.59)
November 2017	0(0.00)	0(0.00)	1(1.63)	1(0.51)	3(3.70)	4(2.04)
May 2018	7(10.00)	10(5.10)	2(3.33)	4(2.04)	8(9.63)	9(4.59)
November 2018	5(7.35)	6(3.06)	5(7.81)	10(5.10)	4(5.06)	4(2.04)
May 2019	5(7.57)	9(4.59)	2(3.12)	4(2.04)	3(4.05)	4(2.04)
November 2019	6(8.33)	10.5(5.35)	1(1.96)	2(1.02)	2(1.02)	3(1.47)
May 2020	2(2.81)	3(1.47)	3(4.76)	6(3.06)	2(2.81)	2(3.12)
November 2020	4(5.26)	4(2.04)	12(1.58)	2(1.01)	3(4.1 PP6)	6(3.06)
May 2021	6(8.33)	8(4.08)	3(4.76)	6(3.06)	3(4.34)	6(3.06)
Mean±SD	4.44±1.18	6.94±3.97	2.44±1.42	4.772±.99	3.77±1.78	5.332±.34
		(3.53±2.03)		(2.431±.42)		(2.89±1.12)

BUP>DU (p>0.05), DU>CU (p>0.05), CU>BUP (p>0.05)

The distribution of draw and label type of questions included in first professional examination of various years is shown in Table-II, separately showing the number of segments and weightage of questions. The mean percentage of weightage of draw and label type of questions of BUP, DU and CU were 12.84±4.44, 15.98±3.13, 17.053±.65. Significant difference was observed in percentage of weightage of draw and label type questions in between BUP and CU but no significant difference was observed in between BUP and DU and in between DU and CU.

**Table-II:** Distribution of draw & label type questions

Examination	BUP		DU		CU	
	Number(%)	Weightage(%)	Number(%)	Weightage(%)	Number(%)	Weightage(%)
May 2017	4(5.97)	16(8.16)	8(12.5)	33(16.83)	9(10.46)	25(12.75)
November 2017	6(8.57)	(21.93)	7(11.47)	27(13.77)	13(16.04)	36(18.36)
May 2018	6(8.57)	20(10.20)	9(15.00)	36(18.36)	9(10.84)	27(13.77)
November 2018	9(13.23)	35(17.85)	9(14.06)	33(16.83)	14(17.72)	42(21.42)
May 2019	6(9.09)	21(10.71)	8(12.50)	29(14.79)	8(10.81)	34(17.34)
November 2019	8(11.11)	27(13.77)	11(21.56)	42(21.42)	9(12.32)	31(15.81)
May 2020	8(11.26)	25.5(12.56)	10(15.87)	33(16.83)	11(15.49)	39(19.89)
November 2020	5(6.57)	18(9.18)	8(12.69)	29(14.79)	7(9.72)	24(12.24)
May 2021	6(8.33)	22(11.22)	6(9.52)	20(10.20)	12(17.39)	43(21.93)
Mean±SD	7.11±2.42	24.16±9.88	8.44±1.50	31.336±14	10.222±38	33.447±16
		(12.844±4.44)		(15.983±13)		(17.053±.65)

BUP vs DU (p>0.05), DU vs CU (p>0.05), CU vs BUP (p<0.05)

The distribution of unique type of questions included in first professional examination of various years is shown in Table-III, separately showing the number of segments and weightage of questions. The mean percentage of weightage of unique type questions of BUP, DU and CU are 24.16±9.88, 31.33±6.14, 26.47±3.84. Significant difference was observed in percentage of weightage of unique type questions in between BUP and DU and CU and DU but no significant difference was observed in between BUP and CU.

**Table-III:** Distribution of unique type questions

Examination	BUP		DU		CU	
	Number(%)	Weightage(%)	Number(%)	Weightage(%)	Number(%)	Weightage(%)
May 2017	19(28.35)	57(29.08)	10(15.62)	34(17.34)	24(27.90)	53(27.04)
November 2017	17(25.37)	49(25.00)	11(18.03)	37(18.87)	25(30.86)	61(31.12)
May 2018	15(21.42)	52(26.53)	15(25.00)	51(26.02)	24(28.91)	61(31.12)
November 2018	18(26.47)	52(29.59)	15(23.43)	45(22.95)	22(27.84)	56(28.57)
May 2019	12(18.18)	42(21.42)	13(30.31)	41(20.91)	16(21.62)	38(19.38)
November 2019	22(30.55)	52.5(26.78)	13(25.49)	39(19.89)	19(26.02)	51(26.02)
May 2020	18(25.35)	54.5(26.48)	12(19.04)	38(19.38)	15(21.12)	49(22.44)
November 2020	34(44.73)	75.5(38.52)	11(17.46)	29(14.72)	18(25.00)	49(25.00)
May 2021	16(22.22)	46(23.46)	17(26.98)	54(27.55)	18(26.08)	54(27.55)
Mean ±SD	19.00±6-26	54.059±5.3	13.00±2.29	40.88±7.95	20.113±.72	51.87±5.2
		(24.16±9.88)		(31.336±.14)		(26.47±3.84)

BUP vs DU (p<0.05), DU vs CU (p<0.05), CU vs BUP (p>0.05)

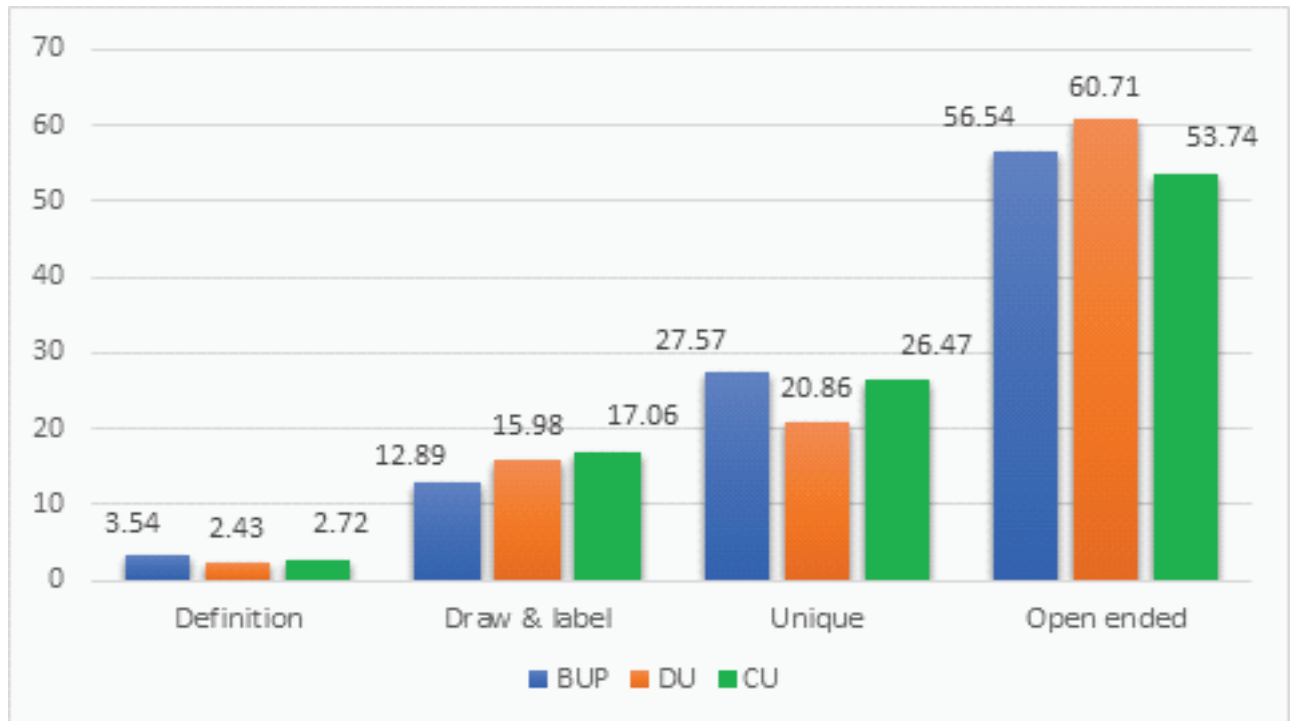
The distribution of open-ended type of questions included in first professional examination of various years is shown in Table-IV, separately showing the number of segments and weightage of questions. The mean percentage of weightage of open ended type questions of BUP, DU and CU were 56.13±4.77, 60.72±5.15, 53.73±5.29. Significant difference was observed in percentage of weightage of open ended type questions in between DU and CU but no significant difference in between BUP and DU and in between BUP and CU.

**Table-IV:** Distribution of open type questions

Examination	BUP		DU		CU	
	Number(%)	Weightage(%)	Number(%)	Weightage(%)	Number(%)	Weightage(%)
May 2017	39(58.20)	111(56.63)	42(65.62)	121(61.73)	48(55.81)	109(55.61)
November 2017	38(56.71)	104(53.06)	42(68.85)	131(66.83)	40(49.38)	95(48.46)
May 2018	42(60.00)	114(58.16)	34(56.66)	105(53.57)	42(50.60)	99(50.51)
November 2018	36(52.94)	97(49.48)	35(54.68)	108(55.10)	39(49.36)	94(47.95)
May 2019	43(65.15)	124(63.26)	41(64.06)	122(62.24)	47(63.51)	120(61.22)
November 2019	36(50.00)	106(54.08)	26(50.98)	123(57.65)	42(57.53)	109(55.61)
May 2020	43(60.56)	120(59.11)	38(60.31)	119(60.71)	43(60.56)	111(56.63)
November 2020	33(43.42)	98.5(50.25)	43(68.25)	137(69.54)	44(61.11)	118(60.20)
May 2021	44(61.11)	120(61.22)	37(58.73)	116(59.18)	36(52.17)	93(47.44)
Mean ± SD	39.33±3.87	110.50±9.77	37.55±5.41	119.11±10.26	42.33±3.77	105.33±10.38
		(56.13±4.77)		(60.725±.15)		(53.735±.29)

BUP vs DU (p<0.05), DU vs CU (p>0.05), CU vs BUP (p<0.05)

The comparative situation of percentages of definition, draw and label, unique and open-ended type questions appeared in the tests of BUP, DU and CU shown in Figure-1.



**Figure-1:** Bar diagram showing percentage of weightage of SAQ of different types.

## Discussion

Anatomy is considered as a major subject not only in the preclinical years but also in the clinical years. Even in post graduate studies of all faculties, it is very helpful to revise the knowledge of gross anatomy as it provides visual positive corroboration in the learning process.<sup>13</sup> The professional colleges have also produced syllabus outlining the level of anatomical knowledge that they expect from their members when examined. Specialist trainees will rightly require more detailed knowledge of anatomy.<sup>14</sup> MBBS 1st year in medical college of India subjects are Anatomy, Biochemistry and Physiology. These subjects fall under pre-clinical subjects. In the first year of the MBBS Syllabus, there are 2 semesters. The subjects under Anatomy are Microanatomy, Gross Anatomy, Neuroanatomy, Embryology and Genetics.<sup>15</sup> Anatomy as a basic subject in medical colleges of Bangladesh is learned within 18 months with Biochemistry and Physiology. Final written assessment of anatomy in India composed of two papers. Each theory paper has 100 marks. Use combination of various types of questions e.g. structured essays (Long Answer Questions- LAQ), (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ).<sup>16</sup> In University of Birmingham duration of Main sit is 1 year, Resit 2 years. In main sit in-course assessment 20% Anatomy EMQ 10%, 20% MCQ and SAQ 50%. In Resit In-course

assessment 1, Anatomy EMQ 12.5%, MCQ 27.5%, SAQ 60%. Short answer question papers are more obviously integrated with anatomy often sharing questions with other disciplines (especially Physiology). The one hour paper has 6 questions each with 10 marks. Students are expected to discuss and describe, apply their knowledge and indicate their understanding. Typically, the short answer paper is the most discriminating when the modules are seen as a whole.<sup>17</sup> In Bangladesh, written examination has formative contribution (10%), MCQ (20%) and SAQ (70%).

This study revealed the distribution of different types of SAQ in first professional MBBS examination of Anatomy in BUP, DU and CU. In the distribution of definition type question there was no significant difference in between weightage of questions of BUP, DU and CU. In the distribution of draw and label type question weightage of questions of CU is significantly higher than BUP but no significant difference in between weightage of questions of BUP and DU and in between weightage of questions of DU and CU. Weightage of questions of unique type in BUP and CU were significantly higher than DU. The distribution of Weightage of open-ended questions of DU is significantly higher than CU but no significant difference in between weightage of questions of BUP and DU and in between weightage of questions

of BUP and CU. Level cognitive domain like knowledge understanding, application is assessed by different types of SAQ-definition, draw and label, unique, open-ended questions. Distribution of level cognitive domain-knowledge understanding, application is mentioned in the curriculum of BMDC but distribution of Different types of SAQ are not mentioned in the curriculum of BMDC. No study was found about the distribution of different types of SAQ.

## Conclusion

In this study, the distribution of different types of SAQ was observed in first professional MBBS examination of Anatomy question papers of BUP, DU and CU. In the curriculum distribution of Levels of cognitive domain is addressed but the distribution of different types of SAQ is not mentioned. Different types of SAQ are used to determine the level of cognitive domain. So, we have to give more attention in the selection of types of SAQ to ensure the proportion of these domain mentioned in the curriculum.

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