

## Influence of formative assessment on summative assessment in undergraduate medical students

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### Abstract

This cross sectional descriptive study was carried out to determine the students' view about the influence of formative assessment on summative assessment. The study was carried out from July 2009 to June 2010 over 300 intern doctors of Medicine and Paediatrics department of two government and two private medical colleges. Data were collected through self administered questionnaire. The questionnaire included different opinion about the influence of formative assessment on summative assessment and were rated using the 5 point Likert's scale. This study revealed that feedback from formative assessment to the students is important to supplement and modify teaching by the teachers. Students' fear is for summative assessment is reduced by formative assessment. Written test, VIVA/SOE and OSCE/OSPE of formative assessment greatly improves the results of summative assessment. Students opined that to improve the formative assessment the number of teachers should be increased, teachers should be trained up, teachers should give more time to the students and optimum feedback should be provided to the students. Frequency of formative assessment should remain as it is. Twenty to twenty five percent marks from formative assessment should be added to the summative assessment.

**Key Words:** Formative assessment, Summative assessment, Teacher, Medical students

### Introduction

Assessment is important in all forms of learning. Michael Serven coined the terms formative and summative evaluation and emphasized their differences both in terms of the goals of the information they seek and how the information is used.<sup>1</sup> Bloom just a year later made formative assessment a keystone of learning for Mastery.<sup>2</sup> He, along with Thomas Hasting<sup>3</sup> and George Madaus<sup>3</sup> produced the Handbook of Formative and Summative Evaluation and showed how formative assessments could be linked to instructional units in a variety of content areas. According to Kellough and Kellough "Teaching and learning are reciprocal processes that depend on and affect one another. Thus, the assessment component deals with how well the students are learning and how well the teacher is teaching".<sup>4</sup> Formative assessment is the assessment that takes place during a course or programming of study, as an integral part of the learning process. It is often informal. Summative assessment is normally carried out at or towards the end of a course it is always a formal process, and it is used to see if learners have acquired the skills, knowledge, behavior or understanding that the course set out to provide them with. It gives an overall picture of performance. Formative

assessment is the assessment of for learning and summative assessment is the assessment of learning. The MBBS curriculum 2002 in Bangladesh has introduced MCQs, SOE & OSPEs/OSCEs based. This curriculum includes formative assessment that is item test, card final, term final, block posting etc and summative examinations that is final professional examination. Provision for adding 10% marks from formative assessment to summative assessment has been introduced. So, it was high time to evaluate the actual effect of formative assessment on summative assessment under present curriculum in Bangladesh. The aim of this study was to determine the students view about the influence of formative assessment on summative assessment.

### Methods

This cross sectional type of descriptive study was carried out in 2 public medical colleges (Dhaka Medical College and Sir Salimullah Medical College) and 2 private medical colleges (Bangladesh Medical College and Holy Family Red Crescent Medical College) in Dhaka city from July 2009 to June 2010. A structured questionnaire reflecting the influence of formative assessment on summative assessment was prepared. Pre-testing was done on 20 intern doctors from Shaheed Suhrawardy Medical College and accordingly data was collected and modified. Permission from the respective college authorities (principles) were formally sought beforehand. A questionnaire for students were prepared to pass their comment in the different aspect of 'the influence' of formative assessment on summative assessment. The questionnaire included different statement about the influence of formative assessment on summative and rated using 5 point Likert scale. Questionnaires were distributed to all the intern doctors of the Medicine department of those respective institutes. Three hundred intern doctors working in the department of Medicine of

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those selected medical colleges who were willing to participate were included in the study as respondents. Purpose of the study was duly explained to the respondent. Information and identity of the respondent were kept confidential. Completed data and questionnaire were collected, edited, processed and analyzed by using SPSS computer package. If necessary some data were handled manually with the help of calculator and Microsoft Excel program.

## Result

Among the respondent 199 (49%) intern doctors were from government medical colleges and 101(24.9%) intern doctors were from non-government medical colleges. Table I shows that 86 (28.8 %) intern doctors strongly agreed and 151(50.5%) intern doctors agreed that formative assessment greatly influence the results of summative assessment. Seventy six (25.3%), 149(49.7%) intern doctors strongly agreed and agreed respectively in their opinion regarding the teachers impression about a student from formative assessment influences the results of summative assessment. On the contrary 26(8.7%) intern doctors disagreed in this aspect (Table II). Seventy percent of the intern doctors (strongly agreed 25%, agreed 44.3%) considered that students fear for Summative exam is reduced by formative assessment (Table III). Among the respondents 75(25%), 152(50.6%) intern doctors strongly agreed and agreed respectively in their opinion that teachers feedback to students of formative exam is helpful for better performance in summative exam ( Table IV). Among the respondents 97(32.4 %) strongly agreed that written test of formative assessment greatly improves the results of summative assessment where as 120 (40%) intern doctors agreed and 21(7%) intern doctors disagreed (Table V). One hundred nine (36.3%) and 117(39 %) intern doctors strongly agreed that Viva/SOE and OSCE/OSPE of formative assessment greatly improves the results of summative assessment (Table VI and VII). Respondents made suggestion in different aspects to improve formative assessment to make a positive impact on summative assessment (Table VIII). Figure I shows most intern doctors want to add less than 25% marks (Mean  $\pm$ SD 22.38  $\pm$ 15.84) to be added from formative assessment to summative assessment.

**Table 1:** Distribution of respondents by their opinions about the statement that the results of formative assessment greatly influence the results of summative assessment

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	12	4%
Disagree	22	7%
Neither agree nor disagree	29	9.7%
Agree	151	50.5%
Strongly Agree	86	28.8%
Total	300	100%

**Table 2:** Distribution of respondents by their opinions about the statement that the teachers' impression about a student from formative assessment influences the results of summative assessment

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	6	2%
Disagree	26	8.7%
Neither agree nor disagree	43	14.3%
Agree	149	49.7%
Strongly Agree	76	25.3%
Total	300	100%

**Table 3:** Distribution of respondents by their opinions about the statement that students fear for summative exam is reduced by formative exam

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	15	5%
Disagree	24	8%
Neither agree nor disagree	53	17.7%
Agree	133	44.4%
Strongly Agree	75	25%
Total	300	100%

**Table 4:** Distribution of the respondents by their opinion about the statement that teachers' feedback to students of formative exam is helpful for better performance in summative exam

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	5	1.7%
Disagree	22	7.3%
Neither agree nor disagree	46	15.3%
Agree	152	50.6%
Strongly Agree	75	25%
Total	300	100%

**Table 5:** Distribution of the respondents by their opinion about the statement that written test of formative assessment greatly improves the results of summative assessment

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	16	5.3%
Disagree	21	7%
Neither agree nor disagree	46	15.3%
Agree	120	40%
Strongly Agree	97	32.4%
Total	300	100%

**Table 6:** Distribution of the respondents by their opinion about the statement that viva/SOE of formative assessment greatly improves the results of summative assessment

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	7	2.3%
Disagree	14	4.7%
Neither agree nor disagree	35	11.7%
Agree	135	45%
Strongly Agree	109	36.3%
Total	300	100%

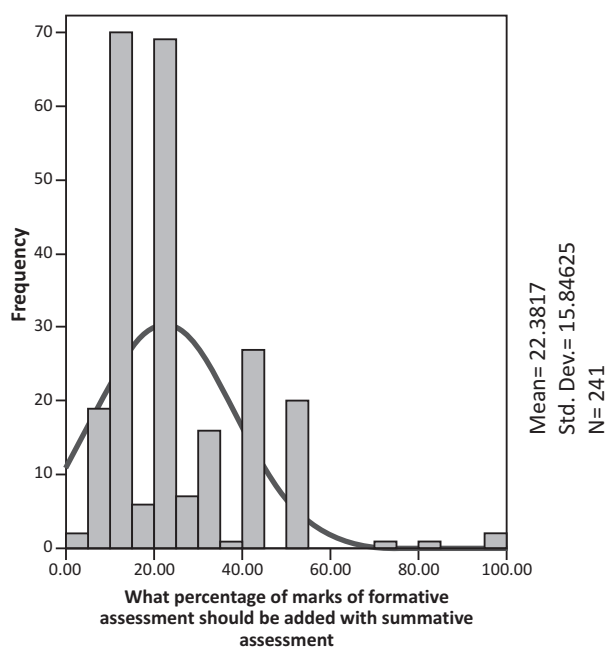
**Table 7:** Distribution of the respondents by their opinion about the statement that OSCE/OSPE of formative assessment greatly improves the results of summative assessment

Different Level of opinion	Intern Doctors	
	Frequency	%
Strongly Disagree	7	2.3%
Disagree	20	6.7%
Neither agree nor disagree	36	12%
Agree	120	40%
Strongly Agree	117	39%
Total	300	100%

**Table 8:** Distribution of the respondents by their opinion about the statement that how the formative assessment can be improved to make a positive impact on summative assessment

Event	Different Level of opinion	Intern Doctors	
		Frequency	%
No. of teachers should be Increased	Yes	142	47.2%
	No	158	52.8%
Teachers should be trained up	Yes	198	66%
	No	102	34%
Teachers should give more time to students	Yes	190	63.3%
	No	110	36.7%
Frequency of formative assessment should be increased	Yes	64	21.3%
	No	236	78.7%
Frequency of formative assessment should be decreased	Yes	96	32%
	No	204	68%
Optimum feedback of formative assessment should be given to the students	Yes	196	65.4%
	No	104	34.6%
Optimum feedback of formative assessment should be given to the teachers to make the teaching more effective	Yes	152	50.6%
	No	148	49.4%

**Figure 1:** Intern doctors' view about the statement that what percentage of marks of formative assessment should be added with summative assessment



## Discussion

Among 300 intern doctors 86(28.8%) and 151 (50.3%) strongly agreed and agreed respectively that the results of formative assessment greatly influences the results of summative assessment. A study conducted by Olson & McDonald found that students scored higher in summative examination who took part in formative examinations<sup>5</sup>. Seventy five percent (strongly agreed 25.3% and agreed 49.7%) of intern doctors considered that teachers' impression about a student from formative assessment influences the result of summative assessment. Majority of intern doctors that is 70 % (strongly agreed 25% and agreed 44.3%) were in agreement with the issue that students fear for summative exam is reduced by formative exam. This study consistent with the finding of Khan KS<sup>6</sup> Majority of the intern doctors that is 76% (strongly agreed 25% and agreed 50.7%) opined that Teachers feedback to of formative exam to students is helpful for better performance in summative exam' whereas 9% intern doctors (disagree 7.3% and strongly disagreed 1.7%) were against in their opinion. Charman & Elmes have shown that feedback enhance students' performance<sup>7</sup>. Majority of the research reports on formative assessment have mentioned that the feedback is most important issues in formative assessment, in other word without feedback formative assessment are useless.<sup>8,9,10</sup> Majority of the intern doctors that is 72% (strongly agreed 32.4% and agreed 40%) supported written test of formative assessment to improve the results of summative assessment and 12.3% intern doctors (disagree 7% and strongly disagreed 5.3%) differed in their opinion.

Eighty one percent (strongly agreed 36.3 % and agreed 45%) of intern doctors supported Viva/SOE and 79% (strongly agreed 39 % and agreed 40%) supported OSCE/OSPE of formative assessment to improve the results of summative assessment. Among 300 interns 142 (47.2%) considered that number of teachers should increase and 198 (66%) interns opined that the teachers should be trained up to improve the formative assessment to make a positive impact on summative assessment. In a study conducted by Khan KS find 70% of the teachers mentioned that number of teachers are inadequate in medical colleges<sup>6</sup>. Similar was the finding by Harden.<sup>11</sup> Two hundred and thirty six (78.7%) interns were against to increase and 204 (68%) were against to decrease the frequency of formative assessment. This study clearly indicates that the frequency of present formative assessment status should not be altered. One hundred and fifty two (50.6%) supported and 148 (49.4%) disagreed with the opinion that optimum feedback should be given to the teachers to make the teaching more effective. This study indicates that the intern doctors are not fully aware of the powerful impact of feedback to the teachers for better teaching learning session. A study was conducted by Vag<sup>12</sup> to find out areas required revision after administering formative exercise. It also provides important feedback to the teachers to evaluate their efficacy and to identify the areas which need re-emphasis or require an alternative strategy. Respondents viewed 25% (mean 28.38) marks of formative assessment should be added with summative assessment.

## Conclusion

This study was designed to explore the students' view about the influence of formative assessment on summative assessment in undergraduate course. The study revealed that formative assessment has got significant effect on summative assessment in various aspects. Feedback from formative assessment to both students and teachers plays an important role in teaching-learning processes. The student's fear for summative exam is markedly reduced by facing formative assessment. Teachers' impression about a student from formative assessment affects the results of summative exam. Teachers should be trained up and numbers should be increased. Teachers should be motivated to give more time to students and proper feedback should be given to the teachers for adopting adequate measures to supplement teaching.

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