

Performance and Perception of First MBBS Students Towards Simultaneous One Sitting Web Based Assessment for Introductory Topics in Anatomy, Physiology and Biochemistry

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Abstract

Web-based formative assessment tools have become widely recognized education as valuable resources for self-directed learning. Introducing **Google forms** for simultaneous assessment of first year subjects in MBBS students is a time saving acceptable approach.

Objectives: To introduce a simultaneous online web based assessment tool (Google forms) for first year MBBS students.

To evaluate the perception and attitude of the first MBBS students towards the assessment tool (Google forms).

Method: 122 first year medical students were informed about an simultaneous one sitting test 4 days prior for the introductory topics in Anatomy, Physiology and Biochemistry. A web page link was shared with the students in their google account and student were asked to reply to the 45 questions asked in the google form. The performance of the students were analyzed in the spread sheet. After completion of the test student were asked to fill 20 questions feedback form each questions were based on Likert scale to evaluate their attitude and perception towards the online assessment of Anatomy, Physiology and biochemistry at a single sitting. The feedback questionnaire was analyzed.

Results: On analyzing the feedback questionnaire it was shown 75 % of students felt answering in google forms are fairer and 65% felt its better than pen and paper assessment. 79% of the students had trust in google forms as they felt cheating cannot be easily done in this tool. 68% of the students felt marking is more accurate in this tool. On analyzing the performance of the students it is seen, 61.4 % of the students were above 50% of the total score out of which 27.04% of the students scored more than 75% . Only 16% of the students were below the 25% of total score.

This study thus showed, students were interested in using the new tool in assessing their knowledge and they too wanted to use the link for revising their subject in future..

Keywords: *Formative assessment, integrated assessment, Feedback questionnaire, Google form.*

Introduction

Modern era students are familiar with the emerging

technologies and its uses. These technologies can be utilized as learning resources, can be well accepted among students as it is beneficial and popular among them. Self assessment helps the students to identify the weak areas and thereby they can focus on it.¹An ideal assessment method should be reliable, valid, cost effective, feasible and acceptable to students and teachers and should be easy to use and unbiased. No single method of assessment can meet all these

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requirements. Each and every method of assessment has some strengths and weaknesses which should be critically analyzed and combination of few method can be used.^{2,3} Multiple studies showed beneficial impact of formative assessments on overall performance of the students by increasing students active participation, preventing procrastination and providing immediate feedback on their performance. Online administration of formative assessments has great advantages, including easy accessibility and availability, interactive features, immediate and individualized feedback and automated scoring which can positively motivate the students to practice and take up these tests.^{4,5,6,7}

Google Forms is a component of Google Docs, which is a free, web-based tool for managing various kinds of files including text documents, spreadsheets and presentations. With Google Forms, a teacher can create a set of questions and invite students to respond to those questions, either through e-mail or on a web page. Google Forms can be used in any course as long as the students have access to computers and internet.^{8,14} Medical council of India's new policies are recommending integrated teaching of basic science subjects with clinical aspects and system wise approach. As we are integrating the subjects teaching through horizontal and vertical approach the assessment too needs to be simultaneous and integrated to get a positive impact.⁹ Thus the attempt to integrate the medical subjects should not stop with the teaching alone it should be extended over to the assessment of the subjects learnt in the form of common assessment of the coordinated subjects taught during a particular year in medical curriculum. This study attempts to evaluate the performance and perception of students in using google forms for assessment of their knowledge acquired through a MCQ test for integrated assessment of introductory topics taught in Anatomy, Physiology and Biochemistry in a single sitting.

Method

Institutional ethical clearance was received prior to the study. Consent was taken from the First MBBS students of 2019-20 batch for the study. The introductory topics in Anatomy Physiology and Biochemistry was taught which included General Anatomy and general embryology, General Physiology, nerve and muscle physiology and in Biochemistry it was Eukaryotic cell its organelle and cell cycle. 45 Multiple choice questions were framed in google forms 15 questions for each subjects. Each MCQ item contained a stem and four

options. Correct option if chosen was awarded 1 mark. Incorrect option is given 0. Students were informed about a simultaneous test 4 days prior. 122 medical students present on the Day of the test and they took up the simultaneous test of all three subjects in Google form. Students were asked to log into their google accounts using the internet service provided by institution in their smart phones or Apple I pads. The web page containing the 45 questions were given to them and they were asked to open and answer the questions. Technical help was provided if some failed to access. After completion of the test students were given a questionnaire for feedback to evaluate their attitude and perception towards web based simultaneous assessment of Anatomy, Physiology and Biochemistry at a single sitting. The performance of the students was analyzed in spread sheets and recorded. The feedback questionnaire consisted of both 20 structured open and close ended questions framed after literature review appropriately validated and each question rated on a five point Likert scale. Data was analyzed by SPSS software and descriptive statistics was used. The feedback questionnaire had four main components i.e. 1. Perception and attitude of the students towards using google forms for MCQ test 3. Reliability of the questions and appropriateness using the tool 4 Practicality of using an integrated assessment and user friendliness. (Table 1,2,3,4).

Results

122 first year medical students took up the survey with the feedback questionnaire on simultaneous assessment by Multiple Choice question in google form answered online. In the questions determining the attitude of students towards the new online tool 55% of the students felt live answering to the questions in google forms was not stressful and 70% of student felt the tool was interesting and enjoyable. About 47% of students wanted to recommend the tool to their peers and solve questions in this format. (table-1)

75 % of students felt answering in google forms are fairer and 65% felt its better than pen and paper assessment. 79% of the students had trust in google forms as they felt cheating cannot be easily done in this tool. 68% of the students felt marking is more accurate in this tool. (table- 2).

Majority of the students felt the MCQ questions were appropriate and was not too difficult and was relevant to the topics taught. 55% of the students felt its

easy to score marks in MCQs in google form. 76% of students felt they can use the MCQs in google form in revising their lessons in future and its good for recalling. 77% of student felt the MCQ questions had improved their knowledge and critical thinking. (table 3)

In the next observation the practicality of simultaneous assessment of questions from all the subjects of first year in a single testing format was assessed. 66% of students preferred simultaneous assessment as it was less stressful and easy and 78 % of students felt it is less time consuming . 67% of the students felt simultaneous assessment should be included partly in university examination. About 29% of students felt preparing for simultaneous one sitting assessment is tedious and confusing as they have to read all the three subjects for preparing. (table 4).

Table 5 (Analyses the performance of the students in MCQ test) shows the total number of responses and percentage of correct responses to the MCQs in google form. About 72.96% of total responses were correct. Table 6 shows the performance of the students in the integrated test. 61.4 % of the students were above 50% of the total score out of which 27.04% of the students scored more than 75% . Only 16% of the students were below the 25% of total score.

This study not only shows that students were interested and accepted using google forms as assessment tool it also shows students performed quite well in simultaneous assessment of all three first year subject in a single test setting. The future prospect of this study is reflected in their eagerness in using the tool for other topics in an integrated way and their desire to include simultaneous online assessment in university exams.

The NYC School of Medicine Online Self Assessment Tool (SOMOSAT) an online self assessment tool consisting of >450 MCQs covering multiple specialities in medicine was administered to the second year medical students accurately predicted student performance on future exams. Students also performed better in future exams and it was helpful in filling knowledge gaps. Similarly in this present student felt integrated self assessment in google forms were regarded by 77% of students to improve their knowledge and critical thinking.¹⁰

Online simultaneous formative assessment promotes self directed learning and also time saving especially in medical curriculum. The study conducted by Kavitha et.al in OBG department did not show a significant difference in performance of the students in summative exams who had participated in prior online formative assessment test to those student who had not attended.¹¹

In a study conducted by Bijoy et.al. on web based formative assessment tool for renal pathology unrestricted and optional access was given to quizzes for medical students and performance of quizzed and nonquizzed students were observed and it showed the quizzers performed statistically better than nonquizzers in their exams. 89% of students felt the quizzes improved their knowledge. In the present study too majority of students wanted self assessment formative MCQ test in future to fill their knowledge gaps, revising their subjects and wanted to recommend to their peers.¹²

This study not only aimed at teaching general Anatomy, general Physiology and cell biology in Biochemistry in an integrated manner but also the assessment was conducted as a single test from all the three specialities. This integrated simultaneous approach which is new of its kind has provided a bird's eye view of the topics taught in three different subjects well integrated and timed not only during teaching but also while assessing the knowledge of the students.

Currently Medical Council of India has revised teaching and learning in undergraduate medical course to competency based medical education with early clinical exposure and horizontal and vertical integrated teaching learning approach. Implementation of simultaneous one sitting assessment the curriculum too needs to be integrated thoroughly. Assessing how students use basic science concepts in clinical reasoning which is vertical integration should go hand in hand with understanding and relating within the particular year too through horizontal integration. Simultaneous one test approach for multiple specialities taught in the same academic year at a single sitting is not only time saving but also prepares the medical graduates to prepare for PG entrance and international competitive exams in future.¹³

Table 1: Perception and attitude of students towards the integrated MCQ test

SI No	Questions	Agree	Uncertain	Disagree
1	The questions were time consuming	35%	20%	45%
2.	The questions were relevant well framed	76%	20%	4%
3	Using the internet and live answering to the questions were stressful	33%	19%	55%
4	Answering to the question in google forms was interesting	70%	15%	15%
5	I will recommend this tool to peers and would like to solve in future	47%	27%	26%

Table 2: Reliability and security of the MCQ test in google forms.

S I No	Questions	Agree	Uncertain	Disagree
1.	Answering questions on google forms are fairer	78%	12%	10%
2.	Online exam using google forms are better than pen and paper based assessment	65%	13%	22%
3	It easy to cheat in google form based MCQ test than in paper exams	11%	10%	79%
4	Marking is more accurate in google forms than in manual correction and evaluation	68%	7%	25%

Carmen BM, Matilde MC, Miguel AF V, Joaquin GE. Google Forms for the Online Assessment of Osces Stations. *Biomed J Sci & Tech Res* 5(2)- 2018. BJSTR. MS.ID.001163

Table 3: Validity of the MCQ test by Google forms

Si No	Questions	Agree	Uncertain	Disagree
1	MCQ question in google form is easy to score marks	55%	12%	33%
2	The chapters taught in my subjects are too tough compared to the MCQ test in google form	25%	7%	63%
3	The MCQ test questions in google form are complex and difficult	34%	11%	55%
4	The MCQ questions in the google can be used for revising my subject in future	76%	11%	13%
5	The questing in this tool was relevant to the topics taught	87%	6%	7%
6	The questions in this tool has improved my knowledge and allow for critical thinking	77%	14%	9%

Table 4: Practicality of Integrated assessment using MCQs in Google forms

SI No	Questions	Agree	Uncertain	Disagree
1	Integrated combined assessment of Anatomy, Physiology and Biochemistry through MCQs by using Google forms is easy and less stressful	66%	15%	18%
2	Integrated assessment using the Google forms are less time consuming	78%	4%	18%
3	Good IT skills will help me to solve questions faster in Google forms	40%	20%	40%
4	Preparation for integrated assessment is difficult and confusing	29%	15%	56%
5	Integrated assessment through MCQs in Google forms are preferred and should also be a part of University exams	67%	10%	23%

Table 5: Shows the total responses and percentage of correct response

Number of participants	Number of questions	Number of responses	Number correct responses	Number of incorrect responses	% of correct response
122	45	5490	3962	1528	72.96

Table 6: Performance of number of students according to scores

SI No	Below 25 % of total score < 11.25 score	25%-49% of total score (11.25 – 22)	Above or equal to 50% of total score (22.5)	51 – 74% of total score	Equal to 75% or above
Number of students	20	27	75	42	33
Percentage of students in each category	16.39%	22.13%	61.4%	34.42%	27.04%

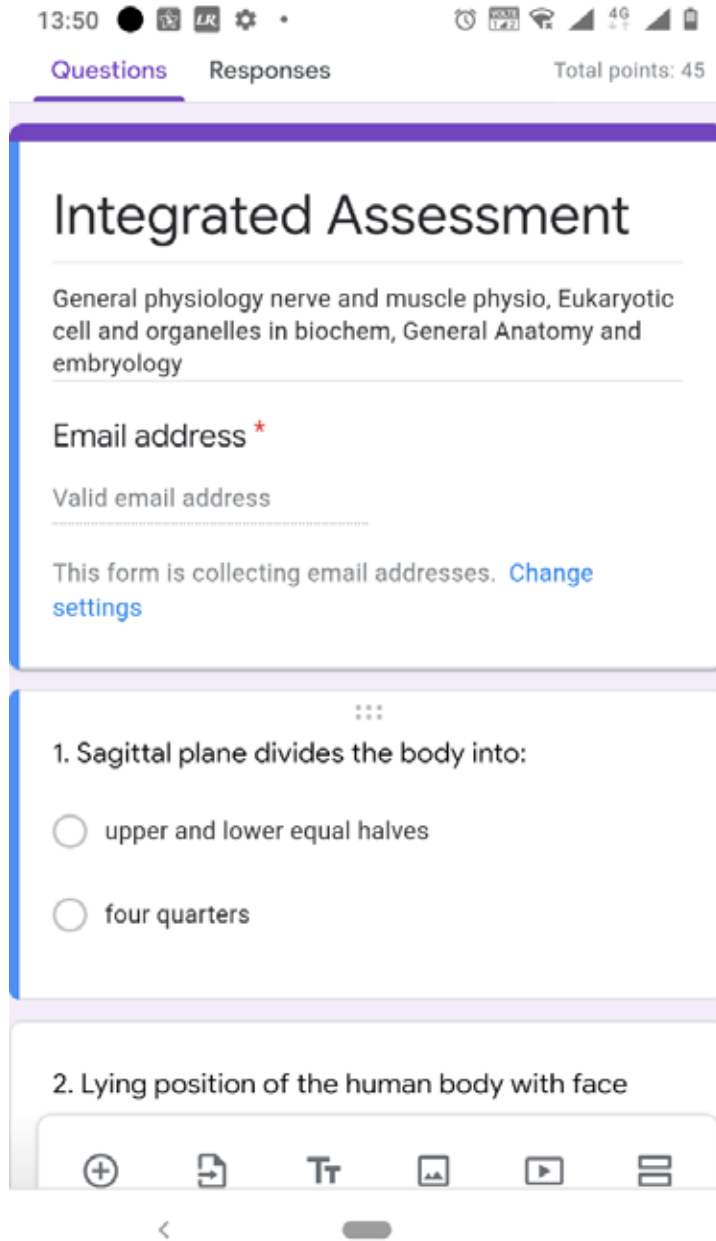


Figure 1

Conclusion

Assessment has always formed an integral and important part of teaching and learning process, especially in formal medical education. Online web based assessment offers a range of benefits in improving the process of learning and on the other hand reduces the workload for teachers and administrators. This study introduces usage of Google forms in assessment of knowledge of introductory topics in basic science subject in a simultaneous single sitting formative exam pattern. The main benefits in this type of assessment process include the elimination of time and space restrictions existing in the case of paper or face-to face exams. At the same time, as google forms are self assessment tools the student is able to gauge their performance too thus this immediate feedback allows for a genuine formative evaluation. In this study first year medical students were exposed to Google forms and E assessment that too in an integrated simultaneous common questionnaire for all three subjects of first year and its intended that this process of assessment will be recommended to university curriculum committee to introduce online google form based formative assessments in a formal way as an assessment tool in future.

Institutional ethical clearance was taken prior conducting the above study

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