

## Evaluating Edmodo as a One on One Educational Tool in Helping to Enhance Academic Performance: An Intervention Study

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### ABSTRACT

**Aim:** To evaluate the role of Edmodo, an online multiplatform educational resource, as an aid in imparting education after college hours to enhance academic performance.

**Materials & Method:** A group of 200 students were chosen for the study and were given the choice to opt for free online educational coaching on Edmodo after college hours. These students were initially categorized into 3 categories based on their performance in routine subjective type class tests and viva voce. The proportions of these categories enrolled on Edmodo and their participation in objective quizzes was monitored and this was finally correlated with subsequent subjective type class tests and viva voce for an improvement in performance

**Results:** Statistically significant changes were noticed in the academically weaker categories B & C with  $p < 0.05$  in the Z-scores. The increase in the performance of students who normally scored less than 50% (C category) led to a decrease in the number of students in this category and an increase in the category those who normally scored between 51-64% (B category)

**Conclusions:** One on One style coaching may be extended to students after routine college hours by way of educational apps like Edmodo with an emphasis on both discussions from a subjective standpoint and more importantly fill in the blanks with specific answers from an objective standpoint to train the students better. This leads to a better grasping of salient points and gives students more confidence with their viva voce answering directly and subjective answering indirectly.

**Keywords:** Edmodo, online learning, student performance, accountability, subjective, objective, fill in the blanks, MCQs.

### INTRODUCTION

Bloom's Taxonomy in its original form with six major categories and subsequent modifications aims to provide a framework of educational objectives we want students to gain out of instruction.<sup>1</sup> Bloom also proposed three domains of learning a) the Cognitive domain b) the Affective domain & c) the Physical domain. Of special importance is sharpening of the intellect by enhancing cognition.<sup>1</sup>

The dental educational system in India has five components a) The Dental Council & regulatory bodies like Universities that decide upon the curriculum b) The Institution that facilitates the process supervised by the management and institutional head c) The specific departments that teach that particular subject d) The students e) The learning environment with its influences (classroom/studyroom/real/virtual/classmates/friends, family). These five factors have an overall

Received: Mar. 11, 2018; Accepted: May. 2, 2018

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influence on the shaping of a student's intellect either directly or indirectly.

To be able to impart the best possible education keeping in mind these five factors one must also understand that educational methodology should constantly evolve by way of a three pronged approach of Planning, Teaching & Assessment.<sup>2,3</sup> An evaluation of the Instructional activities and objectives along with the learning outcomes will usually help strike a balance.<sup>2,3</sup> Be it the head of the department or the institution or a regulatory body, there are usually three aspects of monitoring of an educational system : a) does it comply with the regulations and prescribed syllabus b) are professional norms and standards adhered to & c) are the results satisfactory. The result is often considered to be an indirect reflection of the efficiency of the instructor and the mode of instruction in what is nowadays referred to as accountability in education.<sup>4</sup> As the Indian system of education is not completely based on performance or merit and due to the fact that most students assume that their days of slogging are over once they have secured an admission into a professional course, there exists a hidden challenge of fine tuning the academic curriculum to ensure performance without undue pressure.

Students who do not perform well often have problems with language and comprehension or simply may have a laid back attitude. There has been much debate on how and when students are to be evaluated and by whom with regard to the type of testing pattern and whether the instructor who has taught the students evaluates them directly or are the students evaluated by a computerized objective examination or by an external examiner.<sup>5</sup> Interaction with students usually reveals that given a choice they would rather try answering questions structured in an objective pattern rather than answer subjective questions like short notes or essays. Then again it comes to light that the MCQ pattern is a favourite because it allows a degree of guessing unless negative marking is incorporated.<sup>6,7,8</sup> Students are usually not keen on a fill in the blank type pattern unless they are advised that such questions would train them better for their viva voce due to better retention of specific content following objective tests. Post graduate students are given a better academic exposure

because of a much smaller class size or better teacher: student ratio highlighting the need of somehow enhancing a One on One interaction with students.<sup>9,10</sup>

The use of the online portal Edmodo as an educational platform has been cited in literature.<sup>11,12,13</sup> It was decided to assess the efficiency of Edmodo in being able to provide the feeling of a One on One interaction and thus help coach students with a below average performance.

## **MATERIALS AND METHODS**

A group of 200 students of Dental Materials and Prosthodontics were chosen to be participants of the study. They were categorized based on their performance in subjective tests and viva voce into three categories ( A >65% , B 51 to 64% , C < 50%) The grading revealed that there were 113 A grade students, 44 B grade students and 43 C grade students.

The students were given the option to access Edmodo via their smart phones, tablets or laptops after college hours and were initially exposed to discussions and SAQs (short answer questions) to ascertain their willingness to participate. It became quite obvious that only the students of A & B categories were bold or confident enough to interact this way.

This was a clear indication that these discussions and SAQs were perceived to be similar to standard in classroom subjective tests (essay questions, short notes, short answers).

The students were then told that they would have to attempt answering fill in the blank quizzes which would be conducted prior to routine in classroom subjective tests or viva sessions. Unlike MCQs (multiple choice questions/ single best answer questions) which had the drawback of guessing , fill in the blanks required specificity of answering. Edmodo requires that the instructor uploads the fill in the blanks with the key.

The correct answers are displayed to the student at the end of the test against their wrong entries. The time required to complete the fill in the blank tests was set to provide adequate time in view of internet bandwidth

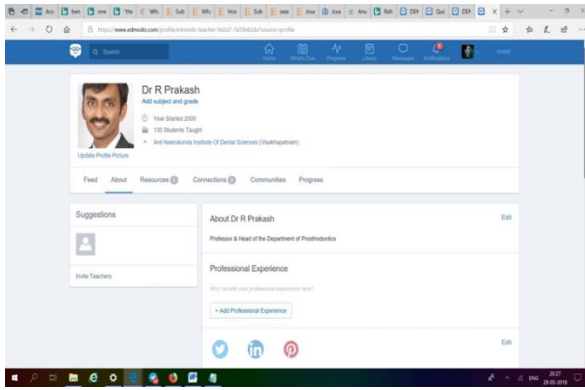


Fig 1: A Screen shot of the Edmodo Instructor Profile Page showing enrolled students.

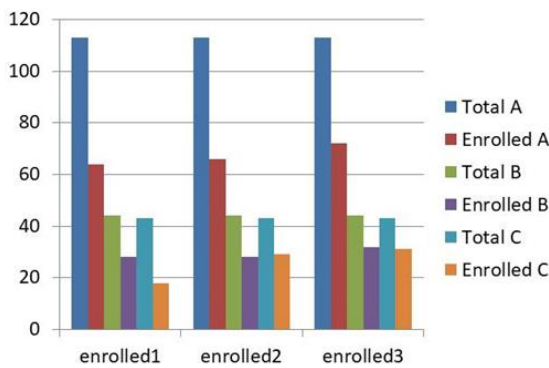


Fig 2: Monitoring of student enrolments as per original grade.

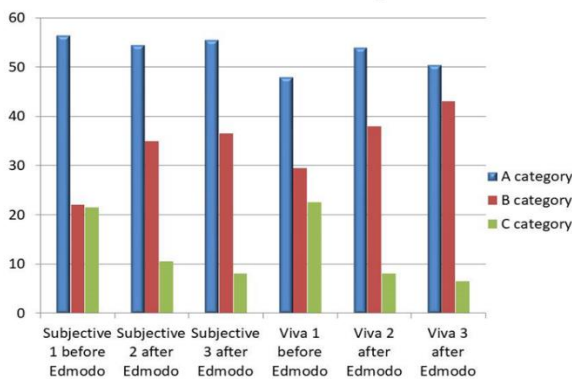


Fig 3: Results before and after edmodo coaching.

issues, difficulty in viewing and using Edmodo on smaller smart phones or requirements of time sharing between Edmodo and other activities.<sup>12</sup> Students were encouraged to search for the answers, be it from the book or from the internet or by discussing with friends as the exercise was to be perceived as research for the most appropriate answers.

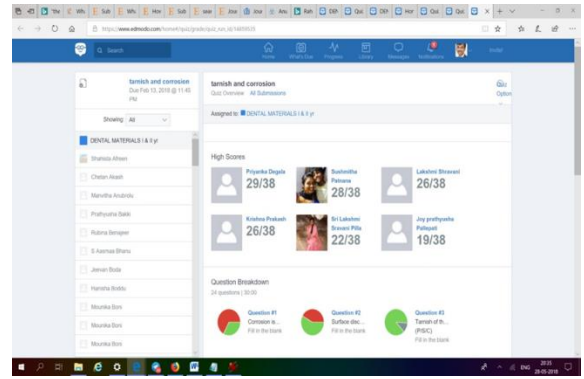


Fig 4: A screen shot displaying test scores.

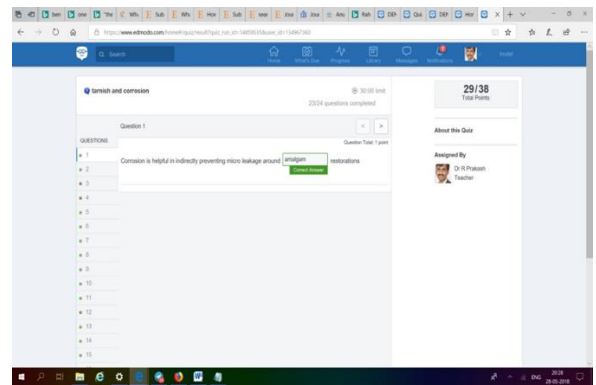


Fig 5: A screen shot showing how Edmodo displays that the answer is correct.

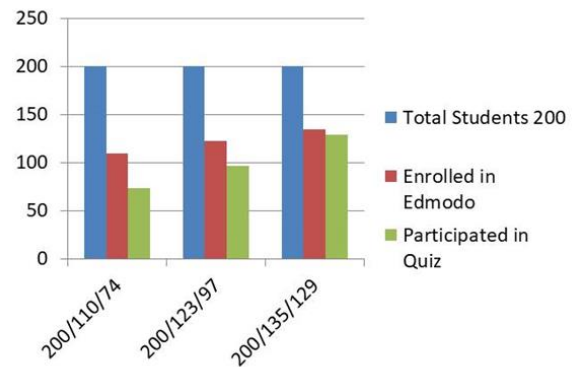


Fig 6: Number of students who enrolled and actually participated actively as against total number.

Of the 200 students, only 110 students initially signed up. When their subjective tests and viva voce data was examined it revealed that these 110 were comprised of 64 A grade, 28 B grade & 18 C grade students. After 1 month the enrolment had risen to 123 (66A/28B/29c) just before the second subjective test and viva voce session and after two months to 135 (72/32/31) just before the third

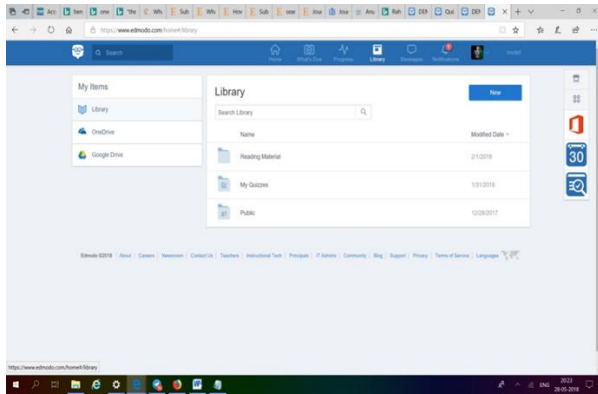


Fig 7: The library section of Edmodo.

subjective test and viva voce session. (Fig 1, Fig 2) An evaluation was made to evaluate if there was any overall change in the performance of the students by the introduction of Edmodo into their academic curriculum. Using the marks obtained during the first subjective test and viva voce as the base parameter subsequent tests after exposure to Edmodo were statistically evaluated using Z-test statistical analysis.

**RESULTS**

The Z-test statistical analysis was performed as a comparison of each individual category (A,B,C) in the two modes of student evaluation (subjective, Viva Voce) before and after introduction of Edmodo. (Table 1)

1. z test was used to compare the subjective pre & post Edmodo performance of category C (43/200 vs 16/200 ) The Z-Score is 3.8071. The p-value is 0.00014. The result is significant at  $p < 0.05$ . The proportion of Yes or No responses for Observation 1 is 0.215. The proportion for Observation 2 is 0.08.

2. z test was used to compare the subjective pre & post Edmodo performance of category B (44/200, vs 73/200) The Z-Score is -3.1874. The p-value is 0.00142. The result is significant at  $p < 0.05$ . The proportion of Yes or No responses for Observation 1 is 0.22. The proportion for Observation 2 is 0.365.

3. z test was used to compare the subjective pre & post Edmodo performance of category A (113/200 vs 111/200)The Z-Score is 0.2015. The p-value is 0.84148. The result is not significant at  $p < 0.05$ . The proportion of Yes or No responses for Observation 1 is 0.565. The proportion for Observation 2 is 0.555.

4. z test was used to compare the Viva Voce pre & post Edmodo performance of category C 45/200, 13/200 The Z-Score is 4.5442. The p-value is 0. The result is significant at  $p < 0.05$ . The proportion of Yes or No responses for Observation 1 is 0.225. The proportion for Observation 2 is 0.065.

5. z test was used to compare the Viva Voce pre & post Edmodo performance of category B 59/200, 86/200 The Z-Score is -2.8083. The p-value is 0.00496. The result is significant at  $p < 0.05$ . The proportion of Yes or No responses for Observation 1 is 0.295. The proportion for Observation 2 is 0.43.

6. z test was used to compare the Viva Voce pre & post Edmodo performance of category A 96/200 , 101/200 The Z-Score is -0.5001. The p-value is 0.61708. The result is not significant at  $p < 0.05$ . The proportion of Yes or No responses for Observation 1 is 0.48. The proportion for Observation 2 is 0.505.

Table 1: Comparison of each individual category (A,B,C) in the two modes of student evaluation.

Category	Z-Score	p-value	Statistically significance at $p < 0.05$
Subjective 1 vs 2 C category	3.8071	0.00014	YES
Subjective 1 vs 2 B Category	-3.1874	0.00142	YES
Viva 1 vs 3 C category	4.5442	0	YES
Viva 1 vs 3 B category	-2.8083	0.00496	YES
Subjective 1 vs 2 A category	0.2015	0.84148	NO
Viva 1 vs A category	-0.5001	0.61708	NO

To summarize, while there was not much of a change visible in the A category, there was a marked increase in the number of B category students due to a marked decrease in the number of below average students. (Fig 3) This could be directly attributed to the subject content being simplified to a 'Must Know' and 'Desirable to Know' sequence of points learned by way of attempting to answer Fill in the Blank objective quizzes.

**DISCUSSION**

An educational system evolves in a constantly repeating sequence of planning, teaching and evaluation. The modern emphasis on evaluation is



on knowing specific details to be considered knowledgeable and thus some of the main methods of evaluation are the objective question variants of MCQs(Multiple Choice Questions/ Single Best Answer questions) , OSCEs(Objectively Structured Clinical Examinations) & Fill in the blanks. There still does exist the method of eliciting objective information by way of Viva Voce. Apart from this objective style of evaluation subjective answering is still encouraged as a means of maintaining the art of organized scientific communication.

A group of students were chosen as in having the normal elements of an educational group as depicted by the grades. It was noticed that there was not much scope of modifying an in class lecture beyond the standard chalk and talk type presentation coupled with multimedia in the form of MS Powerpoint slide presentations and video clips. It was decided to initiate a One on One mentoring program but then again the problem arose with student teacher ratios and available time. Edmodo was chosen as a platform for after hours academic interaction in two ways. Active interaction would require the participation of a teacher online. Passive interaction would just require subject based quizzes and the keys to be uploaded for students to attempt them at their leisure after college hours.

While there was a good amount of interaction seen in discussion threads it was also obvious that only a small percentage of A & B category students were bold or confident to attempt discussion of subject matter, more so because mistakes would be pointed out live for the whole Edmodo group to see. To make things worse the thread would remain there unless the instructor decided to delete it later. After an initial warm up period of discussions mainly intended at emphasizing on important aspects of the syllabus it was decided to inform the students that they would be attempting objective type fill in the blanks instead with enough and more time to leisurely hunt for the answers. They were given the freedom to ask one another, to search textbooks or to search online resources for the answers.

Edmodo quizzes have an auto tallying feature in recording student scores and the instructor has access to a progress screen which indicates the percentage of correctly answered questions.(Fig 4)

An added feature in Edmodo is that only the specific answer would be registered as correct.(Fig 5) If for example an instructor were to enter an answer wrong with a typographical mistake the software would only accept an answer that is similarly wrong. The fill in the blanks were structured to be either complete sentences or a couple of sentences directly taken from the recommended textbook to allow the answer to be remembered contextually.

While not all students enrolled in Edmodo, (Fig 6) it managed to introduce an added dimension to the educational process with a sense of access to the instructors giving a One on One exposure and also enhancing the spirit of competitiveness. As there was a constant interaction with the students during class it was possible to keep the motivation running.

Subsequent subjective type tests showed an improvement in the point wise structuring of answers and less of beating around the bush. Viva questions were more defined and to the point with much less vagueness

## CONCLUSION

Student performance is often an index of instructor competence in today's scenario of academic accountability. The performance of dental students during their four years of academics was evaluated to find ways of enhancing their performance. This study has been an experiment in trying to cater better to the needs of an average student by making the educational requirement a bit simpler by using Edmodo to increasing access to the instructor thus reducing the feeling of pressure. Edmodo has a library section allowing the sharing of electronic data within the group. (Fig.7) The thrill of being able to academically interact across their devices was an added positive factor. Last but not least was the fact that the layout and style of functioning of Edmodo very closely mimics the social networking portal Facebook. One very salient feature is that Edmodo groups are closed groups much like individual classrooms and access is password protected. A parent may be granted access and the parent would have access only to the scores and grades and only the content posted by their child in discussions. Thus a safe, simple and secure virtual classroom was enabled by way of using the multiplatform portal- Edmodo.

### CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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