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A STEP TO IMPROVE ACADEMIC PERFORMANCE IN FIRST YEAR MEDICAL STUDENTS: BRIDGE, REMEDIAL, ENRICHMENT (BRE) PROGRAM

Physiology

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ABSTRACT

Sumandeep Vidyapeeth has initiated an innovative program for student's motivation, conceptual understanding of the topic as well as improvement in academic score. Bridge, Remedial and Enrichment (BRE) program would improve progress of students within class as per their approach to learn. The study is to determine effectiveness of BRE program in first year medical students by assessing their academic score. Material & Method: 150 students enrolled for academic year 2015-16 in medical program and pre-clinical faculty members taking part in the program were considered. Input report (after first assessment) categorized students into three groups viz Bridge having less than 30%, Remedial 30-60% and Enrichment more than 60%. Beneficiaries were calculated after output report (pre-university exam) displays individual students' performance for three pre-clinical courses. Perception for the program was taken using survey questionnaire from students as well as faculties. Data collected was statistically analyzed using SPSS-23 software. Result: 54.05% students were benefited in Anatomy, 68.24% in Physiology while 9.46% in Biochemistry course. 35-45% students accepted that the program was beneficial, gave better understanding of the taught topic, and increased their grades. However 50-55% students disagreed the way program was categorized as students felt divided among themselves and created inferior complex. Majority faculties agreed that program improved students' performance, communication skill and helped them built trust. Conclusion: The program motivated students and stimulated them to read and understand the topic conceptually, finally improved their academic score. Revisiting the program after considering the suggestions proposed by faculty as well as students will further improve the outcome in near future.

KEYWORDS:

-Innovative program, academic performance, faculty, students

INTRODUCTION

"The primary aim of education is to enable the child to be resourceful in the solution of the problems connected with his own needs." (Dr. Ovide Decroly, psychologist & Pedagogue). Indian National Council of Educational Research and Training (NCERT) specifies aims of education as deliberate and more or less external intervention in the life of child.[1]

In authors mind goal of education is to provide desired learning to student with critical appraisal and abstract compilation of content. Students have different learning styles by which they take in and process information.[2,3]

Performance is defined as an observable or measurable behavior of a person in a particular situation usually experimental.4Thus students' performance is very important because, it appears to be the major criterion by which the effectiveness and success of any educational institute could be judged.[5]

Poor academic performance of student may be due to less contextual understanding of course but it may also be due to low self- confidence, interest, lack of interactivity or creativity in classroom,[6] insufficient exposure of students to 'real world' situation, thus pupil didn't work hard for it.[7]

Researchers have reported academic performance as most important stress in pre-clinical dental and medical students in India.[8,9] Moreover student's relationship with faculty is a potential stressor[10,11], personal life issues, patient and clinical responsibility is also a potential stress to medical students.[12] These stress can lead to various physical or psychological detrimental effects.

In India we have only one criterion to select a student for joining medical school, entrance exam. That means none of the entrance exam focuses on the personality approach of the candidate towards the course. We do not explore the versatility of the student by assessing their approach towards research or personal positivism before joining of the course. When Indian students step in the undergraduate medical course, most of them are not aware of the subjects they will be studying or how they will be moving forward towards it. Although Medical Council of India (MCI) has designed an orientation session for fresh joined medical students were medical terminology, communication and professional skills are taught, still a gap is observed. Parenting also does help them to fit in the system. Improvement of academic performance of learner is one of the prime objective of educational centers, which is essential for success and progress. This can be influenced by various factors starting from social to environment moving towards curriculum structure and many more.

Now-a-days many institutes have initiated new teaching tools to help students grow and move ahead. Medical Council of India (MCI) has insisted to organize English language classes for first year medical students during orientation session. This helps student to understand the textbooks and language of teaching faculty within the class. Other than this MCI has started basic and advance courses for faculty development. In spite of all these efforts our institute thought of initiating a wider and systematic approach program for students. This would help and motivate students to improve not only in the understanding of the conceptual aspect of the course but also as per academic score.

Bridge Remedial Enrichment program (BRE) was designed to provide a seamless path for different levels of students within class. Individual components of this program are in vogue outside India. Bridge component is used as foundation program in some of the engineering[13] courses in India. Moreover, remedial courses are used in Indian schools and medical institutes for academically poor students. Remediation approaches in the form of extra session for students with poor academic score or summer sessions or extra clinical session have not been reported scholarly.[14]

This innovative program is an effort to enhance academic success and motivate students towards the field of their interest in health sector. The division in BRE program was considered based on the percentage score achieved by the student in their theory exam of first internal assessment which was conducted after 5 months of joining the medical

program. Student having less than 30% grades are categorized in bridge, while 30% to 60% in remedial and more than 60% in enrichment group this categorization is as per Sumandeep Vidyapeeth policy for the program. The program's objective is to help student move from lower academic grade to higher i.e., bridge to remedial or enrichment and from remedial to enrichment group.

This program is committed to provide educational access and opportunities to students in varied ways. Collaborative effort from every departmental faculty in context to the standards of MCI provides opportunity to students as per their level to make them come up to the enrichment standards.

In 2012, the program evolved at our university and was incorporated at our institute level. Moreover, this is getting modified towards better output by incorporating varied innovative teaching tools till date.

Aim: The study aimed to determine effectiveness of Bridge Remedial & Enrichment (BRE) program in pre-clinical year by assessing academic performance of the students.

Objectives:

- To compare and analyze the outcome beneficiaries of BRE program for pre- clinical year.
- To assess different teaching learning tools for BRE program in pre-clinical courses.
- To analyze the feedback for the program from the students and faculties of pre-clinical year.

MATERIALS AND METHODS

A questionnaire based, non-randomized, observational, cross sectional study was conducted at Smt.B.K.Shah Medical Institute and Research center (SBKSMI&RC) after approval from Sumandeep Vidyapeeth Institution Ethics Committee (SVIEC). A total of 150 first MBBS students of 2015-16 batch were enrolled in the study along with the first year faculty members who took part in the program.

Study considered the input and output beneficiaries' from 2015-2016 batch report of three pre-clinical departments that is Anatomy, Physiology and Biochemistry. The program is effectively functioning in 14 major departments of the institute who submit six monthly reports to the BRE committee for each batch of students. After 5 to 6 months of joining the medical course every batch undergoes first internal assessment. Results of theory exams for first internal assessment is considered as input for the program and pre-university theory exam result is considered as outcome result of the program for which the results were recorded and analyzed. Individual faculty was assigned to each group of students who in-cooperated various teaching learning methodologies as per the categorization and level of understanding of the students (bridge students were focused for must to know topics, remedial for good to know and enrichment for desirable to know topics). All the interactive teaching learning sessions were recorded as highlighted by each department for each group of students.

Students' feedback was appreciated by survey questionnaire having 15 closed ended questions using Likert scale15 and 4 open ended questions regarding the program outcome. Faculty perception for the program was assessed by a separate survey questionnaire prepared and validated by subject experts. The collected data was subjected for statistical analysis using SPSS-23 software which allowed us to prepare evaluation matrix up to the level I.

RESULTS

Table/Figure 1 Beneficiary from BRE program in pre-clinical departments

B= Bridge program;R= Remedial program;E= Enrichment program

Figure1 shows 68.24% beneficiaries from Physiology department, 54.06% from Anatomy department while least of 9.46% from Biochemistry department

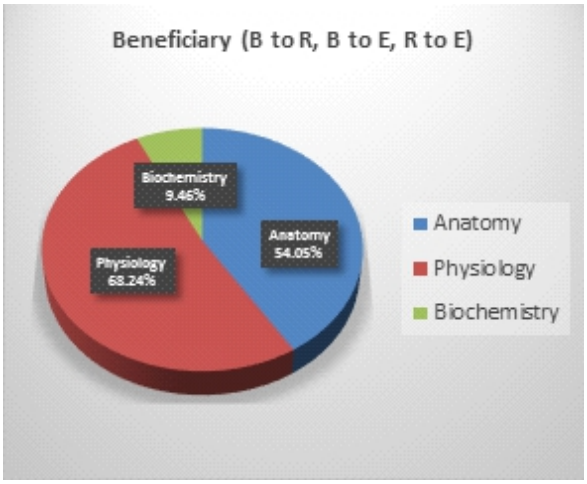

Table-2 Changes in students' academic performance due to BRE program

D	B to B	B to R	B to E	R to B	R to R	R to E	E to B	E to R	E to E	E toE (%)
A	12	41	6	1	32	33	0	2	21	67.8 to 72.95
P	7	23	30	0	11	58	0	0	19	72.0 to 75%
B	10	5	1	11	81	8	2	25	5	75.2 to 63.8

A-Anatomy; B-Biochemistry; P-Physiology;D-Department

Table-2 shows changes in academic performance of students after completion of the program in pre-clinical department. In the department of anatomy and physiology 80 and 111 students respectively showed improvement by uplifting from bridge to remedial or enrichment or from remedial to enrichment. Although 2 students grades shifted them from remedial to enrichment in anatomy. Although in biochemistry 35 students' grades decreased and only 14 students showed improvement. It is observed that 96 students out of 148 in biochemistry did not show any significate improvement in grades as they remained in their original group of BRE program.

Table-3 Teaching Learning methodologies used for different groups for BRE program in pre-clinical departments

• In Class Assignment • Home Assignment • Solving of previous question papers • Evidence Based Small Group Teaching • Team Teaching • Interactive Discussions on Problems	• Student Seminar Presentation Program • Quiz Competition within the class • Multiple Choice Questions (MCQs) solving • Clinical cases • Group discussions • Seminars

Table-4: Faculties' perception for the Advantages of BRE Program for learning enhancement

Questions	Likert's Scale			Mean±SD
	SD & D	ID	SA & A	
Clarified queries in students' minds	2	1	13	3.81±0.834
Easier to understand students' learning progress	2	4	10	3.63±0.885
.Better communication with students	1	1	14	4.19±0.834

Refine teaching methodology to make topic more interesting and explanatory	4	3	9	3.5±1.095
Planning instructional strategies well	3	5	8	3.5±1.033
Able to help students in sustaining their interests	2	6	8	3.56±0.964
Easier to explain assessment criteria	2	7	7	3.38±1.025
Explained the quality assurance in assessment	3	5	8	3.5±1.033
Able to motivate weak students to come forward to communicate	2	5	9	3.94±1.18
Helped us to build trust	1	4	11	3.75±0.775
Motivated faculty to write better exam questions	4	4	7	3.31±1.014
Helped the students to know his/ her strengths and weaknesses	2	2	12	3.81±0.91
Help the students with time management skills	3	5	8	3.56±1.094
Help in motivating students' learning	2	2	12	3.88±0.957

SD-Stongly disagree;D-Disagree;SA-Strongly agree;A-Agree;ID-Indiffrent

Table-4 shows that majority of faculties agree to most of the asked questions with some indifference values and disagreement for Q4, Q5, Q6, Q7 and Q11

Table-5 Faculties' perception for Challenges of the BRE program to learning enhancement

Questions	Likert's Scale			Mean±SD
	SD & D	ID	SA & A	
Time consuming	2	4	9	3.67±1.175
Poor presentation of concerns by students	0	5	10	4.07±0.884
Students were not prepared as per asked	0	4	11	4.13±0.834
Some students feel exposed	1	5	9	3.60±0.737
Students sometimes feel confused	1	4	10	3.80±0.862
More sessions required for completing must to know components	0	2	13	4.27±0.704
More faculty required	1	3	11	4.00±1.134
Difference of opinion among faculty regarding the topics taught	3	5	7	3.4±1.352

SD-Stongly disagree;D-Disagree;SA-Strongly agree;A-Agree;ID-Indiffrent

Table-5 shows that faculties agree to majority of the questions posed for challenges related to BRE program.

Table-6 Frequency & Descriptive Analysis for the perception of students regarding BRE program

Questions	Likert's Scale			Mean±SD
	SD & D	ID	SA & A	
BRE program was beneficial to me.	24	19	66	3.39±1.23
It gave better understanding of the topic taught.	26	25	58	3.28±1.12
Time allotted was less.	59	26	44	2.49±1.09
Content taught were not taught earlier.	66	22	21	2.39±1.06
Helped me study seriously and with focus.	26	26	57	3.26±1.16
Helped to increase my grades.	14	29	56	3.31±1.07
Large content was covered in short time frame.	25	23	61	3.43±1.12
Enhanced my learning.	26	31	52	3.24±1.11
Improved my self-planning for the topic.	25	29	59	3.30±1.10
Motivated me to work more for the course.	23	28	58	3.28±1.07
Facilitators explained me the difficult topics.	28	25	56	3.32±1.15
Session was interactive.	22	27	60	3.33±1.12
Good interaction with peer students.	23	29	57	3.28±1.09
Good compatibility with facilitators.	20	21	68	3.44±1.06
It was up to my satisfaction.	30	31	48	3.10±1.16

SD-Stongly disagree;D-Disagree;SA-Strongly agree;A-Agree;ID-Indiffrent

Table 6 shows students accepting that the program was beneficial, gave them better understanding of taught topic, helped to study seriously and with focus, helped in increasing grades, led to good peer interaction and faculty compatibility. Although they disagreed that topics taught were new and time allotted was less.

DISCUSSION:

The ultimate goal of education and training is to increase the success of students. Thus, all the attention is focused on the efficiency and effectiveness of the process of education.[16] Change and innovation, especially in the field of education in the process of teaching and learning should have a significant result if done as per the objective of the curriculum in interactive manner.

In our study worldwide implementation of individual programs have been clubbed on one platform to improve students' performance so as

they achieve mastery in the course to meet at least minimum standards or to improve the understanding to higher level. The three categorized groups starting from bridge was to allow student to master material sufficiently to meet minimum standards to pass. Remedial to allow students to have grades much higher than passing to groom their knowledge to higher levels so that their approach to achieve objectives in next course will be easier. In this program varied teaching learning tools and techniques were used to improve students understanding by discussion or case scenario, question and answer session as highlighted in Table-3.

Our study found 50-60% students getting benefitted by the program in pre-clinical courses specifically Anatomy and Physiology courses (Figure-1). Table-2 shows students shifting from lower to higher category. However, 29.7% students in Anatomy, 12.16% in Physiology and 61.5% in biochemistry subject didn't show major improvement to shift to higher level, although some (65%) of them had improvement in change in academic score for the course.

Majority of faculties' did accept various advantages of the program like clarified queries in students mind, better communication with students, help in building trust and help to know strength and weaknesses of students so as to motivate students learning. However 50% faculties either disagreed or had indifferent approach for questions like motivating faculties to frame better exam questions, easier to explain assessment criteria's, planning of instructional strategies well other than helping students in sustaining their interest are specified in table-4. Moreover, in table-5 faculties' perception for challenges of BRE program to learning enhancement showed agreement that more sessions were required to cover all important topics, more faculties required to conduct sessions effectively, poor presentation of concern by students, non-preparedness of students, and confusion in students mind. Although 40% of faculties disagreed or were indifferent towards students feeling exposed, program being time consuming and difference of opinion among faculties regarding the topics taught.
According to student's perception 35-45% students accepted that program was beneficial, gave better understanding of taught topics, helped for serious focus towards course, helped increase in grades, motivated to work more for the course, improved self-planning and enhanced learning other than developed good interaction with peer and compatibility with facilitator. Other than this they accepted that session were interactive. However, 60% students disagreed that content taught were not taught earlier i.e., students were aware of the topics as highlighted in table 6 and figure-3. DoostianY (2014)[17] in his study showed a significant difference in the motivation test for academic achievement in the experiment groups' achievement motivation test. AbrahamR[18] who worked on Dundee Ready Education Environment Measure DREEM score for analysis of Indian medical schools recommended that personal and professional development sessions should be implemented for medical students thus our BRE program helps students develop professionally by achieving better understanding of the course content.

In four open type questions posed to students to have better perception for the program functioning highlighted positive as well as negative components for the course as stated in table-7. Some of the positive aspects stated by students were: the course was for their betterment, it motivated, self-regulated, improved their academic score and increase self-esteem. Thought, few of the students felt it as an absolute time wastage, forceful session with no interaction and led to discrimination within them. Nearly 15% objected over the categorization bases while some did not like being stamped in the group all throughout the session. 8% of students wanted more exams to changes categories of the students. Few did not appreciate the methodology of teaching learning. Moreover 14% highlighted on the inconvenience related to timing for its implementation.

Our study is unique in itself thus it cannot be correlated with any of such type but improved understanding for preclinical course by attending class regularly leads to increased academic score thus improves students' performance in subsequent clinical course has been proposed by RoySS[19] Some of the students feel that attendance for program should not be compulsory, but optional. However, class attendance is important for the program to improve understanding level and academic score. CredeM[20] research has proved that class attendance has strong correlation with class grades and grade point average (GPA) in college.

Table-7: Students perception for BRE program

Which Teaching learning method you liked most and Why?	BRE is • good as it helps us to understand nicely and clearly • good for teaching but is time consuming • perfect for medical teaching like quiz to solve my problem • topics related test is best method • test taken was good, as interaction was perfect reading and interacting with students • useful to revise hard topics • difficult topic were covered • question-answer sessions were good • interactive sessions as we could ask our doubts • great to increase our seriousness and helps us to focus • combine study of two subjects • asked questions from other students and gave reply at the same time. Topic study is very good
Which Teaching learning method you did not liked most and Why?	BRE • attendance should not be counted • this program should be conducted • no interactive methods • only few topics were covered • time is more, should be on daily basis • environment was same as lecture • AC should be in class rooms • discriminating by categorizing students • assignments as it does not do any good but just copy paste • should be within college time, as home assignments were time consuming • important questions should be taught • peer teaching was not good • grade based division is not good as you do not know the intelligence of students • instead of topics we should be given questions it will be better for exam point of view
According to you should this program be continued as it is? If, NO kindly specify how it can be improved as per your understanding.	No, • students and many of the teachers are not interested • revision of the group should be there • waste of time • basic should be taught again and further should be continued • group discussion on practical topics should be done • discriminates student only on the bases of one test • should not be after practical, may be on Friday • only two batches should be there • not beneficial for bridge students • was demotivating for me • no progress • program should be optional

CONCLUSION & RECOMMENDATION

One of the prime goal of our institute has been to help the students overcome their perceived deficiencies, and not simple eject them from the program or stress them by facing more failures, thus BRE program has capability to elevate students evaluation outcome to a higher level.
In our study for pre-clinical courses academic profile of student has improved to a great extent in Anatomy and Physiology subject wild mild improvement is observed in Biochemistry subject. Thus authors recommend to continue the program which has power to motivate students and stimulate them to read and understand the topic conceptually and finally improve their academic score. This is the ultimate goal of any institute. However, we should not overlook the

students' approach towards the program. Thus as authors we do recommend suggestions from students and faculties to achieve maximum benefit for each subject as given here under:

- Modifying percentage of categorization, bridge < 50%, remedial 50-65% and enrichment >65%. As the passing percentage of medical program as per governing body (MCI) is 50%.
- Reshuffle students after every assessment within the department so they feel motivated to move towards higher score and get uplifted to higher category thus inculcates the competitive spirit among the colleagues.
- Much better format to sensitize students for the program.
- Program should not foster after practical session.
- Varied interactive teaching learning methods should be used.
- All associated faculties should be prepared beforehand for the session.
- Faculties too are expecting students to be attentive and attend the session with open mind so that light of knowledge can penetrate into their mind. Thus students should come prepared so that their doubts would be clarified.

Recommendations from students as well as faculties sides will positively improve the outcome of the program and in turn would raise the caliber of our institute.

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