Original Article

SKINNER'S PROGRAMMED LEARNING VERSUS CONVENTIONAL TEACHING METHOD IN MEDICAL EDUCATION: A COMPARATIVE STUDY

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ABSTRACT

Introduction: B.F. Skinner (1958) popularized the Skinner's approach of linear programmed learning to improve teaching methods.The purpose of this study was to determine the effectiveness of skinner's programmed learning method over conventional routing teaching method among third MBBS students of AMC MET Medical College, Ahmedabad.

Methods: Third M.B.B.S students of AMC MET Medical College, Ahmedabad were divided into group A(roll no.1-49) & group B (roll no.50-98). Group A was taught topics of breast &esophagus by skinner's method while group B was taught same topics by routine teaching method by same professor of surgery department. Both the groups were assessed by asking questions of six marks of each during 8th& 9th semester examination. Data was complied into excel sheet and analyzed with appropriate statistical test at significance of 0.05.

Result: Out of 98 students, 50 were male & 48 were females. Equal numbers of students were present in both groups during the scheduled lectures. Difference of sex distribution, attending lecturers & scoring in examination among both the groups was statistically not significant (P>0.05). Statistically significant positive correlation was found between attending topics taught by skinner's method with the result obtained in examinations (P=0.000).

Conclusion: Skinner's programmed learning method was positively correlated with the scoring of the students. This method develops creativity, interest among students and this in turn will be helpful in the students learning and overall improvement of students and institute.

Key words: Skinner's Approach, Programmed Learning, Medical Education, Comparative Study.

INTRODUCTION

Teaching and learning are the two sides of a coin. The most accepted criterion for measuring good teaching is the amount of student learning that occurs. There are consistently high correlations between students' ratings of the "amount learned" in the course and their overall ratings of the teacher and the course. Those who learned more gave their teachers higher ratings [1, 2, 3]. This sameCriterion was also put forth by Thomas Angelo, when he said; "teaching in the absence oflearning is just talking"[3]. A teacher's effectiveness is again about studentlearning.

The literature on teaching is crammed full of well researched ways that teachers can present content and skills that will enhance the opportunities for students to learn. It is equally filled with suggestions of what not to do in the classroom. However, there is norule book on which teaching methods match up best to which skills and/or content that isbeing taught. Students often have little expertise in knowing if the method selected by anindividual instructor was the best teaching method or just "a method" or simply themethod with which the teacher was most comfortable[3].Research indicates that students are the most qualified sources to report on the extent to which the learning experience was productive, informative, satisfying, or worthwhile.

There is much debate within the higher education community on how teaching or teaching effectiveness may be defined [4]. For instance, Centra(1993), defines effective teaching as "that which produces beneficial and purposeful Student learning through the use of appropriate procedures". They included both, teach-

ing and learning in their definition, defining effective-teaching as the "creation of situations in which appropriate learning occurs; shaping thosesituations is what successful teachers have learned to do effectively".While in class, students are exposed to all sorts of instructional experiences(lectures, instructional materials and aids, readings, exams). They are in effect experimental consumers—able to discern quality, relevance, usefulness, and instructor interaction with students [5]. As consumers, Cuseoclaims thatstudents can judge what is taught and how it is taught[6], yet Braskamp&Oryclaimthat students can only provide information with respect to teaching[4] .Theall, M. mentioned that the students can answer questionsabout the quality of lectures, the value of readings and assignments, the clarity of theinstructor's explanations[7].

Although Sidney Pressey (1927) originated programmed learning, B.F. Skinner (1958) popularized it [8]. Skinner's approach has been called linear in nature and involves the following features:

- Learners are exposed to small amounts of information and proceed from one frame or one item of information, to the next in an orderly fashion (this is what is meant by linear)
- Learners respond overtly so that their correct responses can be rewarded and their incorrect responses can be corrected
- Learners are informed immediately about whether or not their response is correct (feedback)
- Learners proceed at their own pace (self-pacing)

Branching programmed learning is similar to linear programmed learning except that it is more complicated because it attempts to diagnose the learner's response. After the learners have been presented a certain amount of information, they are given a multiple-choice question. If they answer correctly they branch to the next body of information. If they are incorrect, they are directed to additional information, depending on the mistake they made. Many CBT training courses are based on the concept of linear or branching programmed learning [9].This study was performed to describe the effect of skinner's programmed learning method in scoring of the students and its comparison with routine teaching method.

OBJECTIVES OF THE STUDY

This study was performed to find out the effectiveness of skinner's programmed learning method over conventional teaching method in medical education & to provide suggestions for improving quality of teaching.

METHODOLOGY

Study was conducted among third MBBS students of AMC MET Medical College, Ahmedabad during 2013. There were 98 students in third MBBS of the AMC MET Medical College, Ahmedabad. Students were divided in two groups according to their roll numbers; each group was containing 49 students. Roll no. 1-49 students were included in group A while roll no. 50-98 students were included in group B. Group A was taught two lectures on breast during 8th semester by skinner's programmed learning method while Group B was taught two lectures on breast by routine conventional teaching by the same professor of surgery department. Both groups had asked one question of six marks on breast cancer, during 8th semester internal assessment examination.

Again in 9th semester, group A was taught two lectures on esophagus by skinner's programmed learning method while Group B was taught two lectures on same topic by routine conventional teaching by the same professor of surgery department. One question of six marks was asked in prelim examination on esophagus cancer during 9th semester. Total four lecturers, two for breast & two for esophagus, were taught to the students by two different methods by the same professor of surgery.Group A students were taught by programmed learning of skinner method while group B students were taught by routine conventional teaching method.Students of both the groups(A & B) were assessed by asking one question of six marks, each during eight & nine semester examination to evaluate & compare both method of teaching. University result of seven semesters of these students was obtained to rule out the effect of intelligence of students on their 8th& 9th semester result.Data was compiled in to excel sheet and analyzed using appropriate statistical methods. Test of significance was applied at $P<0.5$.

OBSERVATION

Total 98 students of third MBBS were included in the study.They equally divided in two groups.

Table 1: **Sexwise distribution of the students**

Sex	Group-A	Group-B	Total
Male	21(42.9%)	29(59.2%)	50
Female	28(57.1%)	18(40.8%)	48
Total	49	49	98

Table 2: Group wise distribution of attendance

Attendance	Group-A	Group-B	Total
Present ≥50%	35(71.4%)	35(71.4%)	56
Present <50%	14(28.6%)	14(28.6%)	42
Total	49	49	98

Group A includes first 49 roll numbers and they were taught by skinners programmed learning method while group B includes roll numbers 50-98 & they were taught by conventional teaching method. Table-1 shows sexwise distribution of students from both groups. Majority of girl students (57.1%) were in group A while a majority of boy students(59.2%) were

in group B. But this difference of sex distribution among both groups was statistically not significant (Z=1.63,P>0.05).

Table-2 shows distribution of students from both groups according to their attendance in more than or equal to 50% of lectures or less than 50% of lectures. Equal numbers of students were present in both groups during the scheduled lectures and there was so any significant difference of the attendance in both groups.

Table-3 displays that 34.7% of group A & 46.9% of group B students were scored more than or equal to 50% scoring in the examination. This difference of scoring in examination among both the groups was statistically not significant (Z=1.23,P>0.05).

Total 36 students from group A had written the questions on the topics taught while only 27 students from group B had writtenthose questions. This difference was also not statistically significant (Z=1.93,P>0/.05)

Table 3: Group wise distribution of examination scoring obtained by students

Scoring	Group- A	Group-B	Total
More than50%	17(34.7%)	23(46.9%)	50
Less than 50%	32(65.3%)	26(53.1%)	48
Total	49	49	49

Table 4: Correlation between presence during lectures & examination scores

Parameters	Marks obtained
Group A attendance	0.748(P-0.000)
Group B attendance	-0.074(P-0.615)
Group A – Third first University result	0.080(P-0.582)
Group B – Third first University result	-0.198(P-0.172)

Table 4 explains the correlation between results obtained in each group with the attendance during the taught lectures & university result of third first examination.Statistically significant positive correlation was found between attending topics taught by skinner's method with the result obtained in examinations (P=0.000), while no any correlation was found between the attendance of group B students and their result. To rule out the effect of intelligence of students, correlation was assessed with the result obtained in topics taught by two different methods with their previous university result. But there was no any statistically significant correlation was found between the previous university result and the marks obtained during teaching methods evaluation.

DISCUSSION

In 1954 B.F. Skinner embarked upon a series of studies designed to improve teaching methods for spelling, math, and other school subjects by using a mechanical device that would surpass the usual classroom experience. He believed the classroom had disadvantages because the rate of learning for different students was variable and reinforcement was also delayed due to the lack of individual attention. Since personal tutors for every student was usually unavailable, Skinner developed a theory of programmed learning that was to be implemented by teaching machines [10].

The teaching machine is composed of mainly a program, which is a system of combined teaching and test items that carries the student gradually through the material to be learned. The"machine" is composed by a fill-in-the-blank method on either a workbook or in a computer. If the subject is correct, he/she gets reinforcement and moves on to the next question. If the answer is incorrect, the subject studies the correct answer to increase the chance of getting reinforced next time.

Programmed learning has been proven to be effective by Schramm[11]. A review of 165 studies of programmed learning was made. Of 36 studies that compared programmed learning with the more traditional kinds of training, 17 found programmed instruction to be more effective, 18 found both kinds of instruction to be equally effective, and only one found traditional training to be more effective.

We compared the two teaching methods namely; conventional teaching routinely adapted in the form of simple power point presentation with the skinner's programmed learning method. We found Students scoring was significantly positively correlated with the teaching by skinner's method while there was no any correlation between students scoring & conventional power point presentation teaching. This show skinner's programmed learning method is more effective than the teaching only done by presenting content in the form of power point presentation. But result of this study cannot be replicated because of its limitation that the only four lectures were taken by the skinner's method for the comparison and so, students might opt for the other options to the more easy questions asked in examination which was taught by routine method. So, it is recommended to teach whole syllabus by two different methods to make out comparison and concrete conclusion about the effectiveness of particular teaching method.

REFERENCES

1. Cohen P. A. Student Ratings of Instruction and Student Achievement: A Meta-Analysis of Multisection Validity Studies. Review of Educational Research. 1981; 51: 281-309.
2. Theall M. and Franklin J. Looking for Bias in all the Wrong Places – A Search for Truth or a Witch Hunt in Student Ratings of Instruction?. New Directions in Educational Research. 2001; 109:45-56.
3. Franklin J. Interpreting the numbers: Using a narrative to help others read student evaluations of your teaching accurately. New Directions for Teaching and Learning.2001; 87: 85-99.
4. Braskamp L. A., &Ory J. C. Assessing faculty work: Enhancing individual and instructional performance. San Francisco, CA: Jossey- Bass publishers; 1994: p161-162.

5. An Analysis Of Student Feedback Systems: Montgomery M.J. (n.d.).Available at: http://www.sdsu.edu/campusinfo/ mission.html. Accessed February 24th, 2014.

6. The case for student evaluation of college courses. Policy Center on the First Year of College: Cuseo J. (n.d.). Available at:http://www.brevard.edu/fyc/fya/CuseoLink.htm. Accessed August 20th, 2013.

7. Students Ratings: Myths vs. Research Evidence: Theall M. (n.d.). Available at :https://studentratings.byu.edu/info/faculty/ myths.asp. Accessed July 24th, 2013.

8. Pressey S. L. A Machine for Automatic Teaching of Drill Material. School and Society. 1927; 25: 549-52.

9. Skinner B. F. Teaching Machines. Science. 1958; 128:969-77.

10. Skinner's Teaching Machine and Programmed Learning Theory: Nichole Wleklinski. Available at:http://people.lis.illinois.edu /~chip/projects/timeline/1954 teaching _machine.html. Accessed August 20th, 2013.

11. Schramm W. The research on Programmed Instruction: An Annotated Bibliography. Washington D.C.: U.S. Office of Education; 1964: p-15,82.