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Teaching Neurology to Potential Learners Through Remedial Modular Teaching

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ABSTRACT: ***The present study entitled, "Teaching Neurology to potential Learners through remedial Modular Teaching" was carried out on 56 potential learners who scored < 35% marks in their part completion examination on Neurology. The pre test was taken before the study. Students were taught 4 topics of Neurology through interactive didactic lectures using remedial modules. Students were also given guidelines on question paper writing skill and skill of time management. The post test was taken after the lectures. The learning gains, and feedback was taken.***

It was observed that the absolute learning gain was 43.97% (significant), relative learning gain was 232.40 (significant) and g factor was 0.45 (>0.3: significant).

The feedback analysis for close ended questions was done for remedial modular teaching process, after taking their feedback on Likert scale. The rating average was more than 3 (significant) for all the questions of likert scale. The participants expressed satisfaction on clarity of concept, confidence in writing questions paper and utility of time management while solving the question paper. Students expressed marked utility of remedial modular teaching over conventional didactic teaching.

It is concluded that the use of remedial modular teaching for neurology to potential learners was significantly useful based on learning gains and feedback analysis.

Key words: Remedial modular teaching, Learning gains, Likert scale, time management, question paper writing skill

INTRODUCTION

The introduction and development of strategies to counteract learning difficulties has been a feature of educational policy in India. The formal provision of remedial education in this country, within the national school system coincided with the genesis of philosophy of learning.

With the recent publication of the Green Paper, *Education for a Changing World* (Rialtas nah Eireann, 1992)[1], there is shift towards the operation of market and consumer forces in education. There is an increasing emphasis on individual needs and the optimization of the learning process for all pupils. It implies that, in an international context of new ideas and aspirations, remedial education is now the answer to respond to a growing number of demands.

The term remedial has medical connotations and implies providing a cure for an educational illness. Semantically, it suggests an activity which rectifies a deficiency or corrects some disability or disease (Conroy, 1993) [2].

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In the present system of education, students are identified as low achievers purely on the basis of their poor performance in the examination, which, in most cases deviates from what is taught. So, a low achiever is one whose performance is very dismal in the examination. He is neither mentally retarded nor is on the lower rungs of intelligence scale [(3)].

Such students have the potential to perform better in examinations provided proper guidance is offered to them regarding, understanding of the subject, question paper writing skill and time management. Further "Low achiever" is a stigmatization. If these students are labeled as low achievers they may go for persistent poor performance in the examination and remain back seated. Such students should be encouraged for securing better performance after detecting their difficulties in learning the subject. These students have potentials to score more provided proper guidance is offered to them. Such students are therefore labeled as potential learners instead of low achievers.

Remedial teaching is identifying low achievers and giving them the necessary guidance to help them overcome their problems, after identifying their areas of difficulties.. Contrary to what is said, remedial teaching is done perfunctorily without identifying their areas of difficulty and underlying cause for lagging behind [(4)].

Remedial teaching is to ensure the desired quality of learning. It is a type of teaching aimed at correcting errors or addressing gaps in knowledge [(5, 6 and 7)].

In Medicine Neurology is one of the most difficult subjects to understand to the medical students. The complexity of Anatomy of nervous system, very lengthy course that needs to be covered in short period of time and inability of teachers to explain the topic fully are all the reasons those make learning Neurology still difficult. The potential learners are always at disadvantage in such a scenario.

Teaching such potential learners by modular teaching approach shall help to increase the learning gain in such students.

In the present study therefore teaching Neurology to potential learners through remedial modular teaching (RMT) is undertaken.

AIM

The aim of the present work is to teach Neurology through remedial modular teaching approach to potential learners.

OBJECTIVES

The present study is undertaken with following objectives.

1. To develop and implement the remedial modules in Neurology for potential learners.
2. To evaluate the learning gains after remedial modular teaching.
3. To evaluate the perception of students on remedial modular teaching by taking feed back.

MATERIALS & METHODS

TYPE OF STUDY:- The present study was observational cross sectional study.

INCLUSION CRITERIA

1. All potential learners who scored less than 35% marks in their part completion examination after teaching Neurology.
2. Students who consented for the study.

EXCLUSION CRITERIA:-Students who scored more than 35% marks in part completion test.

SAMPLE SIZE: convenience sampling.

The students of 9th semester of MBBS course at Jawaharlal Nehru Medical College, Sawangi

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(Meghe), Wardha who scored less than 35% marks in their part completion examination after teaching Neurology were selected. The study included total of 56 potential learners.
Institutional ethics committee clearance was obtained vide letter no. DMIMS (DU)/IEC/2015-16/1978 date 12/04/2016.

STUDY PROTOCOL

PLAN OF STUDY
The present study was planned in three phases. These included;
a) Preparation Phase
b) Intervention Phase (Implementation) and

c) Evaluation Phase

PREPARATION PHASE

1. IDENTIFICATION OF THE TOPICS FOR REMEDIAL TEACHING: - The students were asked to select topics for preparation and teaching of selected remedial modules from Neurology after focused group discussion by students. Total four topics from must know area were selected.
2. PREPARATION OF REMEDIAL MODULES:- The preparation of remedial modules for four topics selected by the students was carried out by power point presentation for topics.

Each power point presentation of remedial teaching module consisted of purpose statement, SLO, Content, Summary and Bibliography. The relevant diagrams were included whenever necessary.

3. VALIDATION OF THE MODULES: - The four modules created for remedial teaching were validated for content by two senior faculties from department of Medicine. The suggestions given by both the faculties were appropriately included. Format validation of the remedial modules was done by the faculty from Department of Teaching and learning of School for Health Professionals Education & Research, at DMIMS (Deemed University), Sawangi (Meghe), Wardha.

INTERVENTION PHASE (IMPLEMENTATION):-

1. PRE TEST: - The pre test of all the participants was taken before the intervention. The pre test included solving of one theory paper in medicine on neurology topics selected by the students for remedial teaching. The duration of theory paper was 2 hours 30 minutes. The theory paper consisted of 60 marks and included 14 MCQs of one mark each, 5 out of 6 BAQs of 2 marks each, 4 out of 5 SAQ of 5 marks each, and 2 out of 3 LAQs of 8 marks each) . In MCQs, BAQs, SAQs, and LAQs, 80% questions were of level I and 20% questions were of level II. The mean pre test score of all the participants was calculated.
2. INTERACTIVE LECTURE: - The participants were taken on the interactive lectures of 50 minutes on the topics of neurology. Each interactive lecture consisted of teaching of the students on the power point presentation. One to two questions were asked to the students at the end of every 15 minutes on the part covered and the difficulty on any of the point was solved. Periodic summary of the lecture every 15 minutes was done. The lecture was continued only after all the students were satisfied with their problems in the part of the lecture. At the end of 50 minutes the topic taught was revised and the students were permitted to ask any difficulty on the topic covered.
3. GUIDELINES ON THEORY QUESTION PAPER WRITING: - At the end of

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remedial teaching on all the selected topics, two lectures were taken on theory question paper writing. The difficulties of the students were solved. Guidelines on prioritizing solving of type of questions were discussed. Any difficulty of the students was solved immediately.

4. GUIDELINES ON TIME MANAGEMENT- After issuing guidelines on theory paper writing, two lectures were taken for time management while solving the theory paper. The difficulties of the students were solved. Time to be allotted for writing LAQ, SAQ, BAQ was discussed at length.
5. POST TEST: - The post test of the students was taken at the end of remedial modular teaching. The mean post test score of all the participants was calculated.

EVALUATION PHASE

1. PRE AND POST TEST ANALYSIS AND CALCULATION OF LEARNING GAINS

Pre test was taken at the start of the introduction of teaching learning activity of remedial modules. The syllabus for this pre test was based on the contents of 04 remedial modules. The answer books of these pre test papers were evaluated by two valuers from department of Medicine. If the difference in the marks allotted was more than 10% the answer sheets were evaluated by third valuer and the sum of best of the three was taken as baseline score of pre test for every student. The evaluation was done against the model answers supplied.

Post test was taken after all 04 remedial modules were taught to the students. Same question paper that was used for pre test was also used for post test evaluation.

The mean difference in the scores of pretest and post test was calculated.

The assessment was done by calculating Absolute learning gain, relative learning gain and calculation of g factor using following formulae.

a) The absolute learning gain It was calculated using the formula;
   %Post-test score – %Pre-test score. The difference in the value of more than 30% was considered as significant.
b) The relative learning gain:- It was calculated using the formula;

%Post-test score – %Pre-test score / %Pre-test score. This is an open scale and higher the gain more is the learning gain.

c) Effectiveness of intervention (g Factor) - This was evaluated by class average normalized gain (g).

g = (%Post-test score – %Pre-test score) / (100 – %Pre-test score)] [8]. Class average normalized gain (g) of 0.3 i.e. 30% was considered as significant [8] [9].

i) FEEDBACK FOR EVALUATION OF REMEDIAL MODULAR TEACHING

a) The feedback for evaluation of remedial Modular teaching was carried out using close ended and open ended questions. Five point Likert's scale was used for close ended questions to assess quantitative evaluation. The scale included 5 close ended questions assessed on five point scale and one open ended questions.

b) The evaluation of likert scale for each parameter was done by calculating rating average for each parameter.
c) The rating average was calculated by using the following formula;
   The sum of the weights / sum of the number of responses. Wherein;
   Weight is the weight created for that column in likert scale. For example weight is 1 for first column, 2 for second column, and 3 for third column likewise and the

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number of responses is the actual number of participants who responded to the particular point. The rating average more than or equal to 3 was considered as significant [08].

d) The qualitative analysis of feedback of evaluation for remedial modular teaching was done by using one open ended questions in the program assessment sheets and was analyzed depending upon the types of answers obtained and their percentage.

e) Statistical Analysis

Statistical analysis was done using Microsoft Excel and SPSS as statistical software.

RESULTS

The present study entitled, "Teaching Neurology to potential learners through Remedial modular teaching" was carried out on 56 potential learners from 9th semester students of MBBS from JNMC, Sawangi (Meghe), Wardha. The study included 34 males and 22 females. The male to female ration was 1.54:1.

1. SELECTION OF TOPICS FOR REMEDIAL MODULAR TEACHING

Four topics were selected by participants for remedial modular teaching from Neurology and included

a. Parkinsonism, b. Pyogenic Meningitis c. Ischaemic stroke and d. Cerebellar syndrome

Two classes were devoted for discussion on guidelines for theory question paper writing skill and time management for solving question paper. The results are summarized as under;

PRE – AND POST TEST ANALYSIS AND CALCULATIONS OF LEARNING GAINS

Pre test score (Mean ± SD)	Post-Test Score (Mean ± SD)	Absolute Learning Gain	Relative Learning Gain	Class average Normalized gain	p value
10.60+/- 1.30(18.92%)	35.22 ± 1.39 (62.89%)	43.97%	232.40	0.45	P < 0.001 Si.

The mean pre test score was 18.92% while mean post test score was 62.89%. The p-Value was < 0.001 and hence statistically significant. The absolute Learning gain was 43.97%, Relative learning gain was 232.40 and class average normalized gain (g factor) was 0.45. All values were significant.

1. QUANTITATIVE EVALUATION OF FEEDBACK ANALYSIS

Quantitative evaluation of feedback for remedial modular teaching was done using close ended questions on five point likert scale and calculating the rating average for significance.

Total five questions were evaluated for rating average. The questions asked were, clarity of concepts, clarity of contents, Utility of guidelines for writing skill, utility of guidelines for time management and Overall rating of this Remedial Modular teaching program. The rating average was more than 3 in all six parameters indicating that the quantitative analysis was significantly positive. (Graph No. 1)

GRAPH NO 1:- GRAPH SHOWING THE RATING AVERAGE OF CLOSE ENDED QUESTIONS

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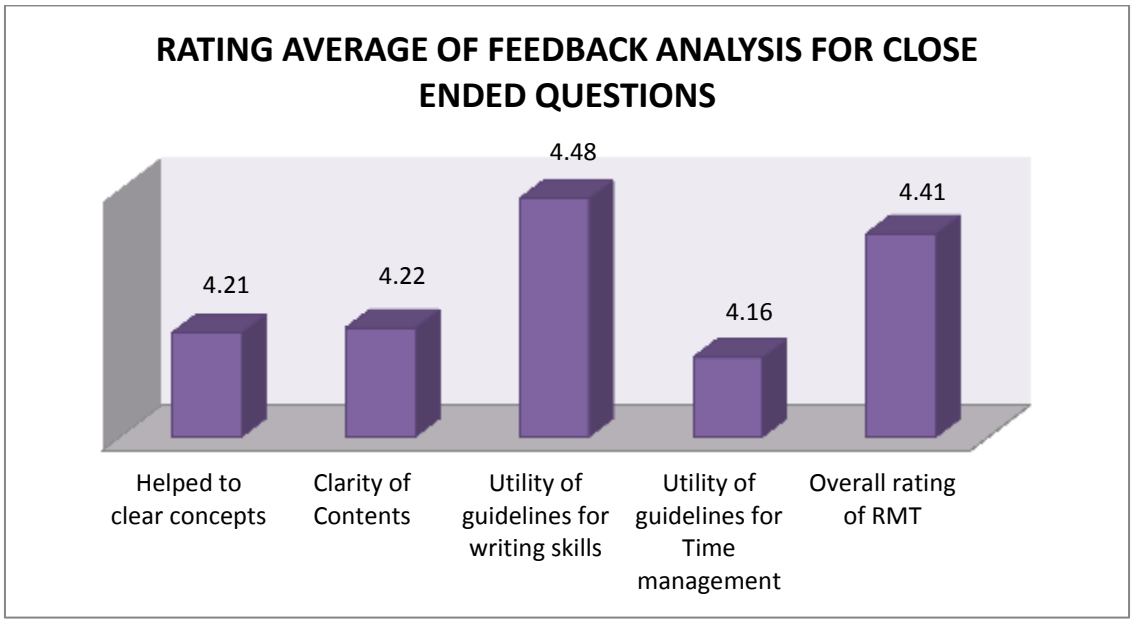
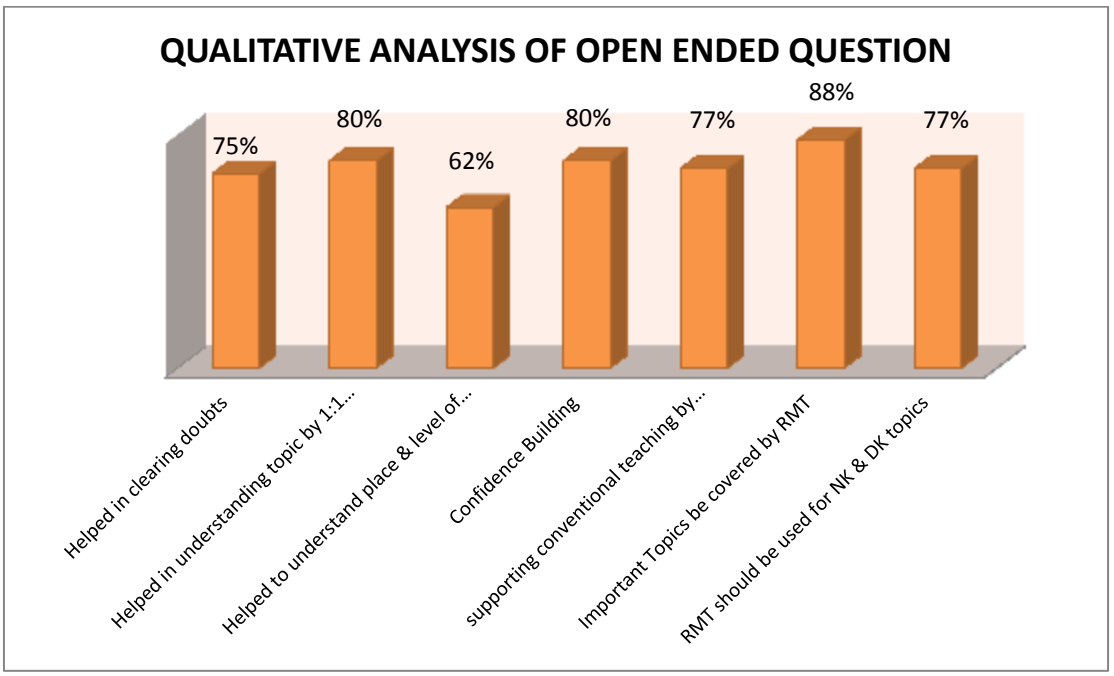


Graph. 2:- RESULT OF QUALITATIVE ANALYSIS OF OPEN ENDED QUESTIONS



II. QUALITATIVE ANALYSIS OF OPEN ENDED QUESTIONS:-

The participants were asked to express their opinions on remedial modular teaching as open ended question. Qualitative analysis of open ended questions was done. It was noticed that 75% participants expressed that RMT helped in clearing doubts on topic. Understanding the topic due to 1:1 interaction was the expression of 80% participants. Other suggestions given by students were help to understand place and level of their understanding (62%), Confidence building (80%), Further, 77% students expressed that conventional teaching should be supported by RMT, 88% students expressed that important topics should be taught by RMT, and 77% students expressed that RMT should also be used for topics from Nice to Know & Desired to Know areas.

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DISCUSSION

The present study entitled, "Teaching Neurology to potential learners through Remedial modular teaching" was carried out on 56 potential learners from 9th semester MBBS students of Jawaharlal Nehru Medical College, sawangi (Meghe), Wardha.

Rialtas et al (1992) [1] realized the need and optimization of learning process of pupils. Remedial education is the answer for providing cure for educational illness. Hence the present study was undertaken.

Four teaching modules from must know area were selected by students. The topics were from Neurology system and included 4 different topics which were difficult to understand to the participants after focused group discussion.

The data from Conroy M (1993) [2] states the utility of remedial teaching at primary level being highly useful.

Brennan WK (1974) [6] in his study on, "shaping the education of slow learners" suggested that remedial teaching for students has better learning of difficult topics. Similar observations were also expressed by Prather EE et al (2009) [10] and Gerald Haigh (1977) [11].

Colt et al (2011) [8] studied impact of learning by measuring learning gains after bronchoscopy course. In the present study also, impact of remedial modular teaching was measured by calculating the learning gains. The findings showed that there was significant increase in ALG (43.97%), RLG 232.40 and g factor was 0.45 (more than 0.3). These findings therefore support that remedial modular teaching increases the learning of the potential learners.

The qualitative feedback analysis was taken for remedial modular teaching process. Various points like help in clearing the concept, clarity of concept, utility of guidelines for question paper writing skills, guidelines for time management were considered for evaluation. The rating average was significant on all these parameters.The overall rating of the remedial Modular teaching was also significant.

The qualitative analysis also showed significant observations. The students expressed that RMT, helped to clear doubts (75%), understanding the topic (68%) and confidence building (80%). The students also suggested that the conventional teaching by didactic lectures should be supported by RMT. The students also suggested that all the important topics in Neurology should be covered by RMT and the topics from desired to know (DK) & nice to know (NK) areas should also be covered by RMT.

Gerald Heigh (1977) [11] and Kieran et al (2001) [12] also supported the view that remedial teaching hasten the learning process of medical science, heighten the efficiency of teaching learning process and modify and adjust methods of providing learning experiences.

Neurology is one of the most difficult system to learn in undergraduate students and similarly difficult to students to understand. It is necessary to take extra efforts to make the topic simple and understandable especially to potential learners. Interactive teaching is one such modality that can make the understanding simple. The remedial modules for teaching Neurology are of use to potential learners especially with the advice on time management on writing the question paper and mechanics in paper writing.

The study has the limitation that only four modules were used for teaching purpose. A similar study based on multiple modules from all levels of difficulties should be undertaken to assess the utility of remedial modular teaching in potential learners.

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Azizan et al (2007) [13] on their work remedial tutorials for differential equations expressed that remedial tutorials help slow learners for better understanding of topics and tackling the problems. It is therefore concluded from the present work that the use of remedial modular teaching for neurology was significantly useful based on learning gains and feedback on quantitative and qualitative analysis.

Abbreviations

RMT – Remedial Modular Teaching

MK – Must know

DK – Desired to know

NK – Nice to know

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