

EFFICACY OF GAGNE'S NINE EVENTS OF INSTRUCTIONS IN IMPROVING THE PERFORMANCE OF UNDERGRADUATE MEDICAL STUDENTS

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ABSTRACT

BACKGROUND: Medical Education is an important part of health education system and its importance cannot be undermined in medical curriculum. One of the pillars of Bloom's Taxonomy is Knowledge and there are several methods of Mode of information transfer (MIT). One of the methods in existing MITs is a formal lecture. Although the efficacy of formal lecture in improving learning outcome of medical students is questionable, yet it is most commonly practiced across the globe.

AIM: To determine the effectiveness of incorporating Gagne's nine events of instructions in power point presentation lectures in improving the result of undergraduate students in subject of pediatrics.

METHODS: It was prospective cohort study conducted in department of Pediatric, Peshawar Medical College. Total numbers of 100 final year MBBS students of pediatrics were enrolled by Non-Probability consecutive sampling. In the first phase, formal PowerPoint lecture was delivered to final year in Non-Gagne's style on Acyanotic heart disease followed by MCQs test. In second phase, the same teacher delivered Power Point lecture on Cyanotic Heart Disease according to the Gagne's nine events of instructions followed by MCQs test. All the data were analyzed using SPSS v.17.

RESULTS: The mean Non-Gagne's marks were 25.7(9-57). The Independent sample T-Test showed no significant difference ($p=0.523$) between male and female students in Non-Gagne's assessment. However, the total mean score of post-Gagne's was found to be 74.39 ± 24.9 (14-100). Paired T-Test showed a significant difference ($p<0.001$) between total mean of Non and Post-Gagne's marks. Paired T-test revealed significant difference in favor of female students ($p<0.001$).

CONCLUSION: Our conclusion is that Gagne's nine events of instructions is an effective tool in improvement of performance in undergraduate medical students in Pediatrics.

KEY WORDS Gagne's nine events of instructions, Pediatrics, lectures

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INTRODUCTION

Medical Education is an important part of health education system and its importance cannot be undermined in medical curriculum. The continuous expansion of medical schools and incorporation of in-

tegrated modules have opened new windows in evolving new teaching methods to improve current teaching Practices.¹

One of the pillars of Bloom's Taxonomy is Knowledge and there are several methods of Mode of information transfer (MIT). One of the

method in existing MITs is a formal lecture.^{2,3} Although the efficacy of formal lecture in improving learning outcome of medical students is questionable, yet it is most commonly practiced across the globe.

In the traditional classroom learning approach, the medical teacher presents the contents, while the students sit in rows listening and taking notes. In this method, the teacher plays the main role and owns the sole authority to deliver information and forms the entire learning progress.⁴ The problem of this method is a great disconnect between the teacher and students. This disconnect has raised some alarming sta-

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tistics recently quoted in literature that 83% of the students preferred clinical sessions over lectures, 92% are not able to concentrate during a lecture beyond 30 minutes, whereas 70% skipped lectures as they were boring.⁵

That was the reason that medical educationist have worked out to develop and design several instructional designs (ID). They are defined as discipline that focuses on how to structure learning material and educational resources for promoting the learning in human. Reigeluth in 1999⁶ and Smith & Ragan in 2000 had proposed different ID⁷ with proven set of principles that were based on a learning theory that came from the research outputs.

One of the Instructional designs was proposed by an American educational Psychologist Mr. Robert Mills Gagné.⁸ He named it as “ nine

events of instruction” and referred it as “condition of leaning” including internal as well as external stimuli.

As a matter fact, formal lectures are still the main stay of MIT in undergraduate medical colleges in Pakistan⁵ and there has been continuous emphasis by medical educationists to replace the existing passive mode of instruction with active learning and inquiry based approach for proper utilization of time and resources. So keeping in mind all the limitations of lectures, we started thinking that lecture is dead now but before declaring its death, we want to incorporate Gagne’s nine events of instruction in lecture to make it more interactive and effective. The rationale of our paper is based upon research question that how much effective is “Gagne’s nine events of instruction in improving overall perfor-

mance of final year medical students in subject of paediatric medicine.

METHODS

It was prospective cohort study conducted in department of Pediatric, Peshawar Medical College. Total numbers of 100 final year MBBS students of pediatrics were enrolled by Non-Probability consecutive sampling. In the first phase, formal PowerPoint lecture was delivered to final year in Non-Gagne’s style on Acyanotic heart disease followed by MCQs test. In second phase, the same teacher delivered Power Point lecture on Cyanotic Heart Disease according to the Gagne’s nine events of instructions followed by MCQs test. All the data were analyzed using SPSS v.17.

RESULTS

Total number of 100 final year students participated in the study. Out of 100 students, 44 students were male and 56 were female students. The score of MCQs in (first phase) after Non Gagne’s lecture versus post Gagne’s lecture (Second phase) is shown in Table 1.

The detail of paired sample T test of MCQs is shown in Table 2.

The independent sample T test showing statistical difference in reference to gender in Non Gagne’s and post Gagne’s test is shown in Table 3.

Paired sample T test was applied to study the significant different separately for male and female students. The details are shown in Table 4 & Table 5 respectively.

DISCUSSION

The medical educationists have unanimously agreed that formal lectures should be inclusive of filters of terms, concepts and interest. The incorporation of “Gagne’s nine events of instruction” has transformed formal passive and teacher oriented lecture into more sequenced, systematic and students oriented lecture. It helps student in getting clear concepts of the topic.⁸

TABLE 1: OVERALL RESULTS OF NON GAGNE'S VERSUS POST GAGNE'S MCQS

	Non Gagne's Result	Post Gagne's Result
No of Students	100	100
Mean	25.79	74.39
Standard deviation	12.918	24.922
Minimum	9	14
Maximum	57	100

TABLE 2: PAIRED SAMPLES STATISTICS OF NON GAGNE'S VERSUS POST GAGNE'S MCQS

	Mean	N	Std. Deviation	P-value
Non Gagne's Marks	25.79	100	12.918	< 0.001
Post Gagne's Marks	74.39	100	24.922	

TABLE 3: INDEPENDENT SAMPLE T TEST OF NON GAGNE'S VERSUS POST GAGNE'S MCQS

	Gender	Number	Mean	Std deviation	P-value
Non Gagne's Marks	Male	44	26.73	14.172	0.523
	Female	56	25.05	11.920	
Post Gagne's Marks	Male	44	66.48	28.826	0.004
	Female	56	80.61	19.465	

TABLE 4: PAIRED T-TEST IF INDEPENDENT VARIABLE IS MALE

	Mean	N	Std deviation	P-Value
Non Gagne's Marks	26.73	44	14.172	< 0.001
Post Gagne's Marks	66.48	44	28.826	

TABLE 5: PAIRED T-TEST IF INDEPENDENT VARIABLE IS FEMALE

	Mean	N	Std deviation	P-Value
Non Gagne's Marks	25.05	56	11.920	< 0.001
Post Gagne's Marks	80.61	56	19.465	

The Gagne's nine events of instructions are Gaining attention, Informing the learner of the objective, Stimulating recall of prerequisite learning, Presenting the stimulus material, Providing learning guidance, Eliciting the performance, Providing feedback, Assessing the performance, Enhancing retention and transfer. Robert Gagne himself has quoted that "Organization is the hallmark of effective instructional materials".^{8,9}

The strength of the study is based upon the fact that it is first prospective cohort study of reasonable sample size in present setup on an important aspect of medical education.

Our study has proved that there was significant improvement in overall performance of students in post Gagne's MCQs test versus Non Gagne's. Belfield J and Roopa S in their study had also endorsed our findings but in subject of radiology and dentistry respectively.^{10,11} Miner A in their bench mark publication, studied effectiveness of Gagne's model for consecutive three sessions in nursing students.¹² She reported significant improvement in grades of students in their final assessment after incorporating Gagne's model in curriculum. This observation is again in accordance to our research work.

The significant improvement was observed in results of both the gender in post Gagne's MCQs after incorporating Gagne's nine events of

instruction to the power point multimedia slides. Our observation is in accordance of literature.¹⁰⁻¹²

The Novel tool of Gagne's model is not only applicable to theoretical aspects of under graduate curriculum rather it has also been successfully reported in teaching psychomotor domain. Buscombe has reported effective role of Gagne's model in significant improvement of bone marrow aspiration in students of clinical hematology.¹³ Khadjooi in 2011 studies the role of Gagne's model in teaching skills of ascetic tap in clinical gastroenterology.¹⁴ He concluded that Gagne's model is excellent way to ensure an effective and systematic learning program as it gives structure to the lesson plans and a holistic view to the teaching.

The performance most frequently required of students is to remember, while our intent is most often to help them understand, and by putting more structure into the objectives of the lesson plans, we will be able to achieve this aim. The overall improvement was significant from 25.7 in Non Gagne's to 75.9 in Post Gagne's test. Our observation is in accordance with international literature.¹²⁻¹⁵

Our study is implicated on all the undergraduate and postgraduate medical teachers, educationists and health researchers for aim of raising the standards of traditional teacher centered teaching style to student oriented model.

We have only studied the domain of improvement of knowledge in subject of cyanotic heart disease. Further research is desired on validity of Gagne's model on training skills and attitude in subject of pediatrics.

CONCLUSION

Our conclusion is that Gagne's nine events of instructions is an effective tool in improvement of performance in undergraduate medical students in Pediatrics.

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NOTES ON CONTRIBUTORS

Both SA and LA were involved in every part of the analysis, idea's development, write-up, and editing the final draft.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

ETHICS APPROVAL

The approval/permission was obtained from Peshawar Medical College Research and Ethics Committee.

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