

A Comparison on effects of Nesting and Sharing teaching methods on Assessment of Phase 3 (Part 1) students in a medical college in RR District, Telangana

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Introduction

As per Graduate Medical Education Regulation (GMER-amendment 2019), the undergraduate (UG) medical curriculum is revised to Competency-based (CBME) from academic year 2019 onwards ¹.

One of the salient features of this revised curriculum is emphasis on integration of contents, keeping the subject specific specialities intact. The idea is to help the learner with an integrated knowledge base, ability to apply skills, faster retrieval of information and more room for curricular exploration ².

The hallmark, as enshrined in the revised curriculum is the suggested methods of integration viz., Temporal co-ordination, Sharing, Nesting and Co-relation ³.

Sharing entails, shared planning and teaching that occur in two or more disciplines involving over-lapping concepts or ideas emerge as organising elements ⁴.

Nesting is the fourth step in the integration ladder by Harden RM ⁵. Here the teacher targets, within a subject-based course, skills relating to other subjects. Fogarty R described this as subject specific approach wherein objectives from other relevant subjects are dealt within the core subject to give a holistic view ⁴. As per Bahri and others the nested integrated learning model is the integration of curriculum in one discipline, specifically to put the focus of interrogation on several learning skills ⁶.

There are many challenges in developing and implementing such integrated teaching in a curriculum. These include lack of will, lack of good leadership support, inadequate infrastructure/resources, prefixed mindsets, and faculty resistance due to fear of more work. There are many myths too, like multiple teachers will be required for one integrated session, they create more confusion, dept. will lose its identity and faculty will lose its importance in discipline-based compartments *etc.* However, the challenges provide opportunities to innovate and experiment with various models of integration and evaluate their utility in the Indian context, especially in the new curriculum ⁷.

A study was planned among phase-3 UG medical students to observe any differences in understanding of topics taught to them using two different methods of integrated teaching i.e., Sharing and Nesting. The students' knowledge was assessed at the end of the sessions to find out any significant difference in their test results, having been taught the same topics by these 2 different methodologies.

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Materials and Methods

Type of study: Qualitative

Setting: Classroom

Duration: 2 months (Aug-Sep 2023)

Sampling method: Convenience sampling

Sample selection: All Phase -3 (Part 1) students present on the days of the classes, were included in the study. The class was divided into 2 groups according to their roll nos., with half the students in each group. The groups were named as A & B. Students absent during any of the sessions were not included in the study. Participation was voluntary and only after due informed consent.

Ethical Approval: Obtained from the Institutional Ethical Committee.

Study design: Descriptive, Cross-Sectional.

Methods

- [a] Initially, the participating students were sensitized about the fundamentals and idea of Nesting and Sharing teaching methodologies. They were assigned 2 different classrooms as per their group (Group A- Nesting, Group B- Sharing) and informed that the same topics will be taught in each classroom over a total of 4 such sessions. All participants were encouraged to attend and avoid absence unless there were valid reasons. The participants were also told that at the end of each class they would have to answer 10 Multiple-Choice Questions (MCQs) on the topic taught, as an assessment of learning.
- [b] Next 4 important topics from Community Medicine were selected in consultation with Head of Departments of other specialties, across all the 3 different phases of the MBBS curriculum. *Stroke* was decided as the topic that would be taught in integration with Physiology Dept. *Maternal Mortality* was to be taught along with Dept. of Gynaecology, *Salmonellosis* along with Microbiology and *Protein-Energy Malnutrition (PEM)* with Paediatrics. The principal investigator would teach by Nesting methodology to Group A. Involved dept. heads were requested to detail faculty for teaching by Sharing methodology, to Group B. Faculty from Community Medicine was also detailed.
- [c] All participating faculty members were requested to share their Power Point presentations with the principal investigator to enable her to amalgamate the presentations and teach by nesting methodology.
- [d] After finalizing the time-table, 4 sets of MCQs on the 4 topics selected, comprising 10 questions each, were readied in Google forms, again in consultation with the specialties involved. It was decided that performance would be studied in 2 categories, those scoring less than 50% and those scoring 50% or more.
- [e] On the days of the classes, the groups were instructed to go to their assigned classrooms and attendance was taken to check whether they have joined their allocated group. Group A was taught the topics by Nesting methodology by the principal investigator and group B by 2 different faculty members of the specialties mentioned in para [b] above. After the class, the MCQs were administered to the groups simultaneously for duration of 10 mins. Answers received were analysed statistically to find out whether there was a significant difference in assessment results between the 2 groups or not.

Statistical analysis– Microsoft Excel software was used to analyse scores obtained by the participants of the 2 different groups in the form of percentages, p values and Chi-square test. As mentioned the performances were broken up

into 2 categories, <49%, and >50%, and significant differences if any were noted between the 2 methodologies of integrated teaching.

Results and Discussion

The group-wise and therefore total responses varied between sessions (range – 97 to 111), as few students used to be absent or were busy in other academic/extra-curricular activities.

The first session on Stroke had 55 students in each group with a few more scoring ≥50% marks in their MCQs in **group A** i.e., Nesting group, as compared to **group B** (Sharing). However the results were not statistically significant ($\chi^2=1.62$, $p=0.2$). In the second session on Maternal Mortality, the results were ditto as more than 10 students from Nesting group scored qualifying marks (≥50%) than Sharing group; though the results were not statistically significant ($\chi^2=0.02$, $p=0.9$). In the third session on Salmonellosis, there was a reversal as few more from Sharing group scored ≥50% as compared to Nesting group. Once again, the results were found to be not statistically significant ($\chi^2=3$, $p=0.08$). In the last session on PEM, 15 more students from Nesting group scored ≥50%, as compared to the Sharing group, the difference being statistically significant ($\chi^2=5.04$, $p=0.02$). This reversal could be due to the students taught by nesting methodology understanding the topic better after 3 previous sessions and the Sharing group losing interest due to different teachers coming in for every session. Table -1 summarizes all the above-mentioned data.

Table -1: Topic wise performances of students

Session 1: Topic : Stroke						
Group Teaching Method	Marks category Performance				Total	
	<50%		≥50%		No.	%
	No.	%	No.	%		
Group A Nesting	3	5.45	52	94.55	55	100
Group B Sharing	8	14.55	47	85.45	55	100
Total	11	10.00	99	90.00	110	100
χ^2 (Yates corrected) = 1.616; p = 0.2040						
Session 2: Topic : Maternal Mortality						
Group Teaching Method	Marks category				Total	
	<50%		≥50%		No.	%
	No.	%	No.	%		
Group A Nesting	13	23.21	43	76.79	56	100
Group B Sharing	10	24.39	31	75.61	41	100
Total	23	23.71	74	76.29	97	100
$\chi^2 = 0.0181$; p = 0.8930						
Session 3: Topic : Salmonellosis						
Group Teaching Method	Marks category				Total	
	<50%		≥50%		No.	%
	No.	%	No.	%		
Group A Nesting	16	28.57	40	71.43	56	100
Group B Sharing	7	13.21	46	86.79	53	100
Total	23	21.10	86	78.90	109	100
$\chi^2 = 2.993$; p = 0.08364						
Session 4: Topic : PEM						
Group Teaching Method	Marks category				Total	
	<50		≥50		No.	%
	No.	%	No.	%		
Group A Nesting	9	15.52	49	84.48	58	100
Group B Sharing	19	35.85	34	64.15	53	100
Total	28	25.23	83	74.77	111	100
$\chi^2 = 5.039$; p = 0.02478						

Since the topic-wise sessions could not be that conclusive, an overall performance status was analysed, and it was observed that there was no significant difference on the whole among the 2 groups being taught by 2 different methodologies of integration ($\chi^2= 2.23$; $p= 0.1$). Table- 2, shows the sum of student performances over 4 sessions.

Table – 2: Sum of student performances over 4 sessions

Teaching Method Vs. Overall Performance						
Group (Teaching Method)	Marks category				Total	
	<50%		≥50%			
	No.	%	No.	%	No.	%
Group A (Nesting)	81	36	144	64	225	100
Group B (Sharing)	59	29.21	143	70.79	202	100
Total	140	32.79	287	67.21	427	100
$\chi^2 = 2.228; p = 0.1356$						

The results of the current study are comparable to the one done among 2nd year medical students of Chulalongkorn University, Thailand, which demonstrated that most participants (74.1%) had a positive impression of the sharing teaching strategy for a Neurophysiology course; which was significantly >50.7% than at the beginning of the course ($p < 0.001$).⁸ Similarly, Koens and others observed that an integrated approach in medical education which includes Nesting-Sharing models among others, captures students' attention and creates more excitement in learning, prevents repetition, enhances reinforcement of important areas or topics, and improves retention of learning.⁹

Limitations: Firstly, although the study targeted only medical students of a particular phase, the sample size was limited and to some extent unbalanced. Secondly, since the study was carried out in a short span of 2 months over 4 sessions and limited to 4 topics, this could have affected the final observations made and results obtained. Also, it is conjectured that the faculty involved as facilitators are beginners as regards implementation of Nesting and Sharing methodologies, and it might have been a tad difficult to co-ordinate with different depts. for the same.

Financial & Ethical implications – Nil

Conclusions

This study related undergraduate student performances with novel nesting-sharing approach of teaching. Phase 3 (Part – 1) students were exposed to these 2 different methodologies of integrated teaching. Their knowledge after the sessions was assessed and it was found that the overall pass percentage (scoring $\geq 50\%$) was high. It is therefore reflective of the fact that there is an enhanced understanding of the topics taught, by integrated teaching.

It also showed that whichever among both these methods is followed the results of performances are more or less the same. On the whole, the experience with Nesting-Sharing was promising. The Nesting-Sharing approach might help promote academic performances in the classrooms as well as in the clinical and community settings, among medical students. It is suggested that the newer methods may be useful and acceptable for undergraduate medical teaching.

Comparative studies with traditional methods of teaching and assessment can be done to further emphasize on the fact that integration is a better approach. It is suggested that more studies on different integration methods across all the phases of the UG syllabus need to be carried out in different settings like socio-clinical case studies in the community as well as case presentations in the Wards /OPD setting, to provide a clearer picture.

In our humble opinion, it is essential that traditional methods be preserved and we respond to the challenges of the times, if that is necessary to improve medical education. There is no superior teaching system or methodology; we need quality standards and enthusiastic, highly motivated teachers, and students must be placed at the centre of medical education¹⁰.

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