ORIGINAL ARTICLE   CODEN: AAJMBG

Effectiveness of module- based WhatsApp group discussion in Anatomy supplemental to traditional classroom teaching

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Abstract: *Background:* Now, when the Medical Council of India is stressing upon the Self-Directed Learning (SDL); and the UG medical curriculum is shifting towards the Competency based medical education; this study has been conducted to observe the acceptability and the academic utility of the SDL by making WhatsApp-group, in Anatomy learning of the students. *Aim & Objective:* To implement the WhatsApp Group Discussion (WGD) sessions in SDL in Anatomy and to assess its effectiveness in academic performance of students. *Methodology:* In parallel to traditional classroom teaching, in a three-month's span module-based discussion was carried on in WhatsApp group framed with all the 199 students. After the formative assessment (FA), students' feedbacks were obtained for acceptability of the WhatsApp based discussion and their achieved marks were compared to the previous result to assess the utility of such. *Result:* [A] Majority of the students have replied that it helped them to (1) clear doubts, (2) get in touch with peers as well as the facilitators, (3) study at their own place, at own time, (4) participate in the group discussion, even when they stayed apart. (5) It provoked them to find the internet to solve the answers of the questions. [B] Overall less students failed in examination held afterwards than the previous exam. Students who have participated more actively in the WhatsApp session, had better differential score. *Conclusion:* Self-directed learning, peer assisted group discussion perceived as the positive attributes for the WhatsApp based group discussion. It opened the avenue for 24x7 academic utility of social media.

Keywords: Anatomy Teaching, Module Based Teaching, Self Directed Learning,

Introduction

Traditionally, learning theories tend to be clustered in three large categories: behaviourist, cognitivist and constructivist. In short, behaviourist theories are those that propose that knowing is the result of objective experience; cognitivist theories are those that propose that knowing is the outcome of mental processing; and constructivist theories are those that propose that knowing is subjectively constructed. In constructivist theories, the focus is on the learner and the process of learning versus the transmission of information from the instructor. It is presumed that learners bring pre-existing knowledge and experience to a learning situation. The learners are encouraged to take responsibility for their learning and to assume a reflective stance to it. The teacher's responsibility is to facilitate the learning process. This occurs through the purposeful design and structure of the curriculum and learning activities [1-5].

The "Self Directed Learning (SDL)" is repeatedly emphasized by the Medical Council of India and implemented in the present academic year undergraduate curriculum. *"There must be enough experiences to be provided for self learning. The methods and techniques that would ensure this must become a part of teaching learning process"* [6] It is mentioned in the UG Curriculum volume 1 as "Dedicated time has been allotted for self directed learning…" [7].

So far the teaching-methods have been described in different literature, it has been divided in (1) large group teaching methods-

as the lecture, panel discussion, symposium etc.; as well as the (2) small group teaching methods-like group discussion, tutorial, seminar, team based learning, team assisted learning etc., but seldom it is stated to use the "web-based learning" or using the "social media" as the teaching method to the students.

Modern generation of students belongs to the 'generation Z'. They are much more tech savvy as well as they are accustomed with the m-based learning as well as the cloud based learning. Simultaneously the teaching learning trends has been changed to a paradigm shift from the teacher centric learning to the learner centric learning. Self directed learning comes in front step by step to improvise the learning of the MBBS graduates. But in fact, the truth is that, even in today, in majority of the medical schools, amongst the majority of faculties, the didactic version of teaching is more liked than the interactive teaching. Moreover the teaching-learning of the subject like Anatomy in the first professional MBBS course is much liked to be getting taught in the traditional ways as going on for the decades.

"WhatsApp" is a common social media interaction, almost the most accepted social media for interaction. We, even our students also spend a significant time at WhatsApp. So far searched, no literature speaks for the utility and students' feedback on using this WhatsApp group discussion as the teaching-learning method for the subject of Anatomy in first professional MBBS students, in West Bengal except our pilot study done in a year ago, where it has been conducted in only 39 students in their dissection/demonstration class in Anatomy; where students perceived it high and in favour of such a teaching-plan. [8]

So in this study aimed to implement the WhatsApp based group discussion in parallel to the traditional classroom teaching; amongst all the students making a pre-designed teaching module; to promote and provoke the "academic" usage of WhatsApp amongst the students of Anatomy. To implement the WhatsApp based group discussion sessions in Self Directed Learning in Anatomy and to assess its effectiveness in academic performance of students of the Phase 1 MBBS batch in Anatomy, at IPGME&R, Kolkata

Objectives:

1. *To assess the perception of students* for the WhatsApp based group discussion for 'Self Directed Learning' in Anatomy, in Phase 1 MBBS students in Anatomy at IPGME&R, Kolkata
2. *To assess the effectiveness* of the WhatsApp based group discussion for Self Directed Learning in Anatomy, in Phase 1 MBBS students in Anatomy at IPGME&R, Kolkata
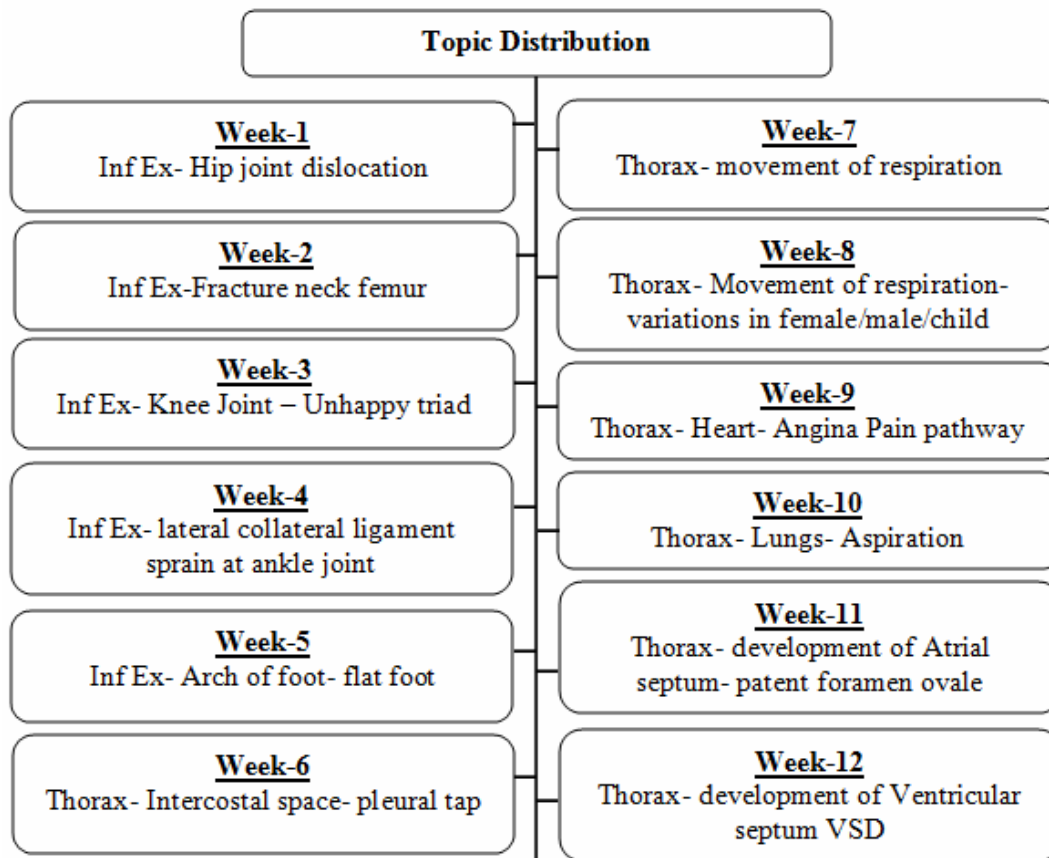
Material and Methods

After finalisation of the project proposal in ACME (Advanced course in medical education) platform, the proposal was submitted to the higher authorities of the Institute (Ethics Committee, Dean's office) for obtaining permission. After permission, this study was carried on amongst first professional MBBS students in three (3) months duration i.e. from November 2019 to January 2020. All students have been approached with illustration of the project, to enrol voluntarily in the Whatsapp group framed by the author. Their enrolment induced their informed consent to participate in the project. So ultimately a group of 199 students has been formed.

The blueprint of the teaching material, which would be implemented for the students, in parallel to the traditional physical classroom, over the three months' in WhatsApp group discussion; was framed by the authors and presented in the department before all the faculties in the month of September 2019. Entire teaching-material was divided in twelve modules or "haunts" with few policies for implementation as;

(a) Each topic would be started with a problem-based case scenario as the "haunt", which would need to be replied by using the higher level of cognitive domain, searching the internet & books.
(b) Each "haunt" would be discussed over one-week.

(c) There might be "triggers" put by the facilitator if the discussion is seen to be declined,

(d) The proposer/author should maintain the facilitation in the way, so that students participates in discussion,

(e) When one student would raise and query/ question, this would not be directly answered by any faculty, rather would be provoked for open discussion in rest of the students.

(f) The low achievers (who failed in the first exam) would be provoked to make the summary of the one-week discussion and would be asked to post the same in the WhatsApp group [Fig 1].

Fig-1: Teaching plan/ Blueprint in WhatsApp based Group Discussion over three months

Topic Distribution

Week-1 Inf Ex- Hip joint dislocation	**Week-7** Thorax- movement of respiration
Week-2 Inf Ex-Fracture neck femur	**Week-8** Thorax- Movement of respiration- variations in female/male/child
Week-3 Inf Ex- Knee Joint – Unhappy triad	**Week-9** Thorax- Heart- Angina Pain pathway
Week-4 Inf Ex- lateral collateral ligament sprain at ankle joint	**Week-10** Thorax- Lungs- Aspiration
Week-5 Inf Ex- Arch of foot- flat foot	**Week-11** Thorax- development of Atrial septum- patent foramen ovale
Week-6 Thorax- Intercostal space- pleural tap	**Week-12** Thorax- development of Ventricular septum VSD

The departmental faculties have provided the acceptance-score against each module according to their perception to implement among the students. Before the implementation, the scoresheet of the first part completion examination (when subject has been taught by only physical classroom method) has been obtained with due permission of the Head of the Department. So accordingly, in the phase at November 2019 to January 2020, while the usual physical classroom sessions have been conducted on; in parallel of that the WhatsApp based group discussions also been carried out. After the tenure, (1) students' perception has been obtained by the google feedback questionnaire & (2) their score sheet of the part completion exam obtained from the department.

The score sheets, which have been obtained before and after the sessions compared, analysed using the standard statistical software to assess the effectiveness.

Results

All the modules have been accepted by the departmental faculties with 80% and above acceptance-score [Table 1].

Table-1: Distribution of the average acceptance scores provided to the teaching blueprint, by the departmental faculties		
Module no.	**Avg. acceptance score (max 5)**	**Wholesome acceptance score for the entire teaching plan**
1	4.4	
2	4.7	
3	4.8	
4	4.8	
5	5	
6	5	4.7
7	4.6	
8	4.7	
9	4.8	
10	4.6	
11	4.6	
12	4.8	

Table-2: Distribution of Phase 1 MBBS students' according to their Frequency of active participation in the Whatsapp based group discussion sessions [n=199]			
Students' participation frequency	**Participation score**	**Nos. of students**	**%age**
>5 times/ week	5	19	9
>3 but <5 times/ week	4	31	16
1-3 times/ week	3	66	33
< once/ week	2	69	35
once in fortnight	1	14	7

It was observed that majority of students have participated less than thrice in a week. 35% of students participated less than once in a week. 33% students participated once or twice in a week. Only one fourth (25%) of students participated more than thrice in a week [Table 2].

More than 80% responses emphasized that the WhatsApp based Group discussion has helped the students for (1) clarification of doubts, (2) study by group discussion seating in their own place at own time, (3) building habit to search internet for academic use; although 2.6% felt the method not at all useful to them [Fig 2].

Fig-2: Distribution of students' responses on utilisation of the sessions in Whatsapp based group discussion for Self Directed Learning in Anatomy [Multiple-response] [N=199]
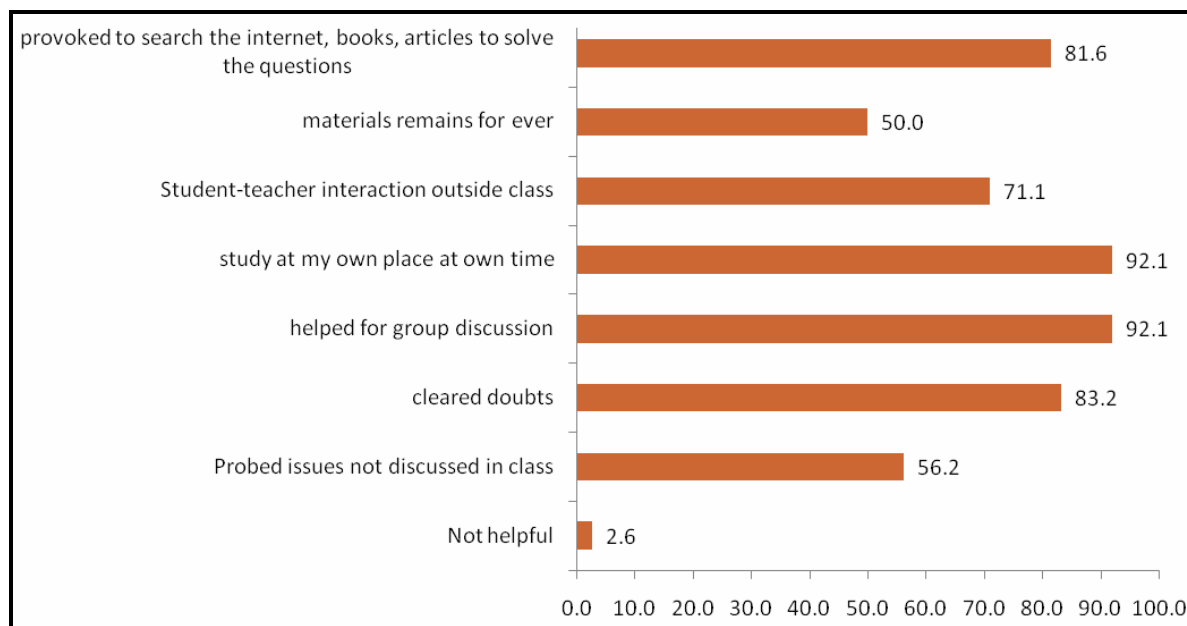
In the first examination 41 students have failed, whereas in the second examination only 13 students have failed. When the participation score was tallied with the difference of the marks achieved by individual students; a strong correlation of coefficient value 0.8 has been found; representing strong association of active academic participation in whatsapp group discussion with the academic betterment [Table 3].

Table-3: Paired sample t test for the second marks (post-session exam scores) and the first marks (pre-session exam scores) of the participant students; highlighting the effectiveness of the teaching plan [N=199]					
Paired Samples Statistics					
		Mean	**N**	**Std. Deviation**	**Std. Error Mean**
Pair 1	Post-session exam score	30.784	199	5.7943	0.4107
	Pre-session exam score	26.271	199	5.1027	0.3617
Paired Samples Correlations					
			N	**Correlation**	**Sig.**
Pair 1	Post-session exam score & Pre-session exam score		199	0.819	0.000

Discussion

The study highlighted firstly, the whatsapp based teaching plan to was well accepted by the students, provoked and promoted them for self directed learning in Anatomy for the Phase 1 MBBS students; in supplemental to the traditional class room teaching. Secondly, the participation in the Whatsapp based group discussion in Anatomy sessions is also reflected as the proportionate betterment in performance in the examinations. The students who have participated more in the forum for academic discussion, have performed better in subsequent examinations. When on one hand, the classical disadvantage of whatsapp discussion is that each participant should to have the smart-phone with access of internet; but on the other hand the motivation for the "self directed learning" is the felt to be strongest advantage of the whatsapp discussion,

In 2014, study conducted in Taibah University. Case Control study amongst 30 students. 15 students in experimental group with 15 students in control group. The attitudes of students suggests that WhatsApp instant messaging makes learning easy, favors problem solving and resolves learning difficulties related to the learning process or to learning content distributed through WhatsApp, knowledge sharing [9].

Mohanakrishnan K *et al.* in 2017 [10] have conducted a case control study in 100 MBBS students of second phase of MBBS, where 50 students were instructed through WhatsApp based platform and 50 students were exposed to traditional lecture classes. Post test MCQ was performed. Significant difference was observed in the experimental group (whatsapp group) and the lecture group (control group). Moreover the students reflected that the massages conveyed through whatsapp based discussion platform was clear, easy to understand, thought provoking, and abled to gain confidence before the examination.

Similar study by Dar QA *et al*. [11] in 190 students, 4th year MBBS students explored that the Whatapp based learning is more favoured by female participants, as an easy way to interact with teacher, peers in compared to the face to face classroom teaching. Students also replied that learning at any time, at any place in relaxed time. However the authors discussed that there would to be potential challenge for the m-based learning as to become a superficial learner. Study of Raiman L et al [12] amongst final year MBBS students also revealed that Problem based learning is better studied in the

WhatsApp based forum. Further study amongst second phase MBBS students of ESIC Joka, Kolkata also revealed positive reflection from students who have been incorporated in WhatsApp based discussion forum [13]. Study of Indu M et al in 2018 at Kerala amongst Dental under graduate students showed that better academic result in the students who have been included in the WhatsApp based discussion platform [14].

In 2019, study in Oman Medical College, Iraq, has been conducted in final year medical students, where tasks were allotted in Whasapp forum as – short answer questions, MCQ, pictures of case scenario, data to analyse; within the final year MBBS students. Students reflected in positive form as a method of getting engaged in group discussion, critical thinking in interactive way with peers. Moreover the presence of the facilitator-guide helped them in decision making in different stages. As a whole it was their "positive learning experience" [15].

Study of Nanda M in 2019 [16] has depicted that the biggest challenge for any teacher to improve the slow-learners. 3rd Professional MBBS students. Students of the third professional MBBS who use smartphones and have WhatsApp facility and willing to study through WhatsApp along with their regular teaching schedule was identified as slow learners and fast learners depending on their performance in the first semester examinations.

All these students were put into a single WhatsApp group and were given assignments that they had to write and submit in JPG format and also upload one latest research article on that topic. After 5 months, the students were analyzed for performance in the second semester examinations and feedback was taken regarding their experience with this study method. Results: Most of the students showed that interest in this method among both slow learners (88%) and fast learners (87%) and felt their knowledge has improved (80% in slow and 77% in fast learners). The overall performance also improved in the second semester examinations.

Limitations perceived are:

➤ The study period is only of three months. More time may be spent to evaluate the usefulness of the whatsapp based forum discussion on Anatomy for the first year students

➤ The betterment of performance in the pre and post examinations here focused to be correlated with the students' active participation in the whatsapp forum discussion. Although such betterment may be due to their more concentration on the academics. Moreover, as the topics of assessment differs, so in future, the pre and post test can be carried out on the same topic based on their phase wise learning.

Conclusions

In this study a pre-framed department-accepted teaching module was implemented in students of Anatomy to promote and provoke them for Self directed learning; over three month period. This endeavor was well-accepted amongst the students and majority have opined for its usefulness. Moreover its effectiveness reflected in their improvement in examination score. After the pilot study done one year back in only 39 students, this endeavor with entire batch of 199 students re-established the acceptance of the use of WhatsApp towards academics, if get planned and facilitated in proper way.

Conflicts of interest: There are no conflicts of interest.

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