MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.10.229.233

OPEN ACCESS

Key Words
Flipped classroom, MBBS, didactic lecture

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Received: 10 August 2024
Accepted: 11 September 2024
Published: 16 September 2024

Citation: Geetanjali Kumari, Vidushi Singh, Pramita Dubey, Sonia Teotia and Nivriti Singh, 2024.To Compare Didactic Lectures and the Flipped Classroom Approach for Better Learning of MBBS First Professional Students: A Comparative Analytical Study. Res. J. Med. Sci., 18: 229-233, doi: 10.36478/makrjms. 2024.10.229.233

To Compare Didactic Lectures and the Flipped Classroom Approach for Better Learning of MBBS First Professional Students: A Comparative Analytical Study

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ABSTRACT

In evolution of New curriculum for medical graduates there is a shift of focus now on prioritizing advanced cognitive skills like application, analysis, synthesis and evaluation, especially when it comes to understanding clinical concepts alongside basic sciences, which necessitates the evolution in teaching methodology as well. Flip Classroom study allows students to interconnect content more easily and correlate the foundational knowledge they have acquired, facilitating a deeper comprehension of clinical concepts. It is a descriptive cross-sectional study conducted among 1st year MBBS students. A sample of 100 students from regular MBBS course were enrolled in this study. 5-point Like rt scale ranging from strongly disagree to strongly agree is used to evaluate the student response for questionnaire. Data was Analysed using MS Excel. 56.4% agreed and 28.2% strongly agreed that FC session improved the understanding of the key concept of the topic. 82% in total states that FC approach provides sufficient knowledge of the topic. 43.6% agreed and 33.3% strongly agreed that FC method was more interesting as compared to the traditional method. The flipped classroom model encourages students to take an active role in their learning process. Classroom sessions in the flipped model provide opportunities for peer interaction and collaborative learning. Students engage in discussions, share insights and work together on projects, enhancing teamwork skills essential for medical practice.

INTRODUCTION

In the traditional method of lectures, the students use their lower level of cognition and they are gaining little knowledge[1]. In the increasing demands of the medical curriculum, it is crucial to prioritize advanced cognitive skills like application, analysis, synthesis and evaluation, especially when it comes to understanding clinical concepts alongside basic sciences. This shift in focus necessitates a re-evaluation of traditional lecture-based teaching methods and calls for a more integrated approach within the classroom setting. The flipped classroom approach consists of two main components: pre-class learning and in-class activities[2]. Different formats can be employed for the first component of flipping the classroom, such as slide presentations, audio podcasts, videocasts, animations, screen captions and evidence-based website links. The second component involves engaging in problem-based learning (PBL) and stimulating discussions, which elevate the level of learning outcomes by assessing clinical competence[3]. As a result, this approach facilitates the practical application of knowledge and fosters comprehensive thinking. It can be accomplished by offering students more active learning opportunities[4] Moreover, this approach also encourages the concept of self-directed learning, empowering students to take greater responsibility for their own learning rather than relying solely on the facilitator. Within the flipped classroom, students will be actively engaged in applying the knowledge they acquire, allocating a majority of their time to practical application. This method allows students to interconnect content more easily and correlate the foundational knowledge they have acquired, facilitating a deeper comprehension of clinical concepts[5].

Plays a vital role in the flipped classroom approach due to its significance in understanding the functioning of the human body. In the flipped classroom, physiology serves as a fundamental building block for students to comprehend and apply knowledge in clinical scenarios. By engaging in pre-class activities, such as watching videos or reading materials, students can acquire a solid foundation of physiological concepts and mechanisms. During in-class activities, physiology is further reinforced through problem-based learning, discussions and interactive exercises. Students have the opportunity to actively apply their knowledge of physiological principles to solve clinical problems, analyse case studies and participate in collaborative learning experiences. The flipped classroom approach allows for a deeper understanding of physiology by emphasizing critical thinking and the integration of knowledge. Students are encouraged to connect physiological concepts to real-world scenarios, enhancing their ability to analyze complex clinical situations. This active engagement fosters a more comprehensive grasp of physiology and prepares students for the practical application of their knowledge in clinical practice.

In order to meet or surpass global benchmarks in terms of knowledge, attitude, skills and communication, the undergraduate medical curriculum in India has been redesigned. To achieve these competencies, it is essential to critically evaluate the teaching-learning methods employed. Consequently, the flipped classroom approach emerges as a potential alternative model that promotes student-centred learning and enhances comprehensive thinking. By allowing students to learn subjects at their own pace and convenience, this methodology can effectively address the diverse needs of learners.

In this particular study, the flipped classroom approach was implemented in the physiology curriculum, and its impact was assessed quantitatively and qualitatively. The objective was to expand our existing understanding of the effectiveness of this approach by comparing it with traditional didactic lectures. By employing this research methodology, we aimed to gather valuable insights into the efficacy of the flipped classroom model in enhancing the learning outcomes and experiences of students in the physiology domain.

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MATERIALS AND METHODS

Study Design: A descriptive cross-sectional study was conducted among 1st year MBBS students of Hind Institute of Medical Sciences Barabanki Uttar Pradesh.

Study Subjects: All the 1st MBBS students present on the day of conduct of study and willing to participate. Students were explained about flipped classroom as an innovative teaching method in medical education and

the purpose of this survey. Students were exposed to flipped classroom method of teaching on ten different occasions in their physiology classes prior to the survey. The study was conducted within one month of the conduct of flipped classes to avoid recall bias. Permission was taken from the Head of the department of physiology. Students were assured of confidentiality for giving unbiased opinion.

Study Tool: A structured questionnaire was used to obtain information on student's perception about flipped classroom. The questionnaire was validated by faculty who have undergone advanced training in medical education. The questionnaire had twenty items on various aspects of flipped classroom. Responses were collected using a 5 point Like rt scale ranging from strongly disagree to strongly agree. Scoring was given from 0-4. 20 multiple choice questions were given to the students after teaching the topics and marks were evaluated

Data was Analysed Using MS Excel:

RESULTS AND DISCUSSIONS

Figures And Tables:

56.4% were agreed that the conduction process was explained adequately.56.4% agreed and 28.2% strongly agreed that FC session improved the understanding of the key concept of the topic. 82% in total states that FC approach provides sufficient knowledge of the topic. agreed and 33.3% stongly agreed that FC method was more interesting as compared to the traditional method.

In response to the evolving landscape of medical education and the changing needs of learners, innovative pedagogical approaches have emerged. Among these, the flipped classroom model has garnered attention for its potential to enhance student engagement and promote active learning. This research explores the advantages of integrating the flipped classroom model into medical education, particularly in catering to the preferences of students. The flipped classroom model encourages students to take an active role in their learning process. By reviewing pre-recorded lectures or materials before class, students arrive prepared to engage in interactive activities. Active engagement fosters deeper understanding and retention of concepts, as students apply their knowledge in problem-solving scenarios and case discussions.

The flexibility of the flipped classroom allows students to access materials at their own pace . Learners can pause, rewind and review content as needed, accommodating diverse learning styles.

Classroom sessions in the flipped model provide opportunities for peer interaction and collaborative learning. Students engage in discussions, share insights and work together on projects, enhancing teamwork skills essential for medical practice.

Instructors can assess students' understanding in real time during classroom activities.

Integration of Technology: The flipped classroom model leverages technology tools to deliver content effectively and engage students. The integration of technology aligns with the preferences of millennial students, who are comfortable with digital resources and interactive learning platforms.

By emphasizing problem-solving and application of knowledge, the flipped classroom model prepares students for the complexities of clinical practice. Students develop critical thinking skills, clinical reasoning abilities and effective communication strategies essential for their future roles as healthcare professionals. In the realm of educational research, recent studies have shed light on the preferences and perceptions of students regarding the flipped classroom model. In this study it was found that a significant majority (80%) of participants expressed agreement or strong agreement with the notion that the flipped classroom approach fosters enhanced interaction and communication with both instructors and peers. Further corroborating these findings, Nouri's investigation revealed a prevailing positive attitude among students (75%) towards the flipped classroom model[1]. Students indicated that they found the approach to be both easier and more effective for learning purposes compared to traditional methods. Building on this foundation, Zhao *et al.*'s research uncovered intriguing insights into student preferences regarding instructional models. Approximately 46% of respondents expressed a preference or strong preference for the flipped model, highlighting its appeal among a significant portion of the student population. Although 38% of participants leaned towards the traditional approach, the notable preference for the flipped classroom underscores its growing recognition and acceptance[2]. Additional studies by S K Gubbiyyapa[3], Veeramani[4] and Morgan[5] echoed these sentiments, with overwhelming student satisfaction reported across various educational contexts. The consensus among participants was clear: the flipped classroom emerged as an effective and favoured tool for teaching and learning. These findings underscore the importance of considering diverse pedagogical approaches to cater to the evolving needs and preferences of modern learners. Similar findings have been reported by other studies where students felt online videos are very valuable to their learning[1-4-2].

In the realm of educational dynamics, it's imperative to acknowledge the diversity among students, not only in terms of their learning pace but also their preferred learning styles, ranging from visual and aural to

Table No 1: Students' Responses to the Questions on the Flipped Classroom

Q No	Questions	Sd (%)	D(%)	N(%)	A(%)	SA(%)
Q no 1	At the beginning of the session, the conduction process was explained adequately	0	0	2.6	56.4	41
Q n2	2. The activities during flipped classroom (FC) session improved my understanding of key concepts of the topic	5.6	0	12.8	56.4	28.2
Qn3	11. This FC approach provided sufficient knowledge of the topic	2	3.2	12.8	56.4	25.6
Qn4	13. The FC session was interactive	2.1	5.7	12.8	53.8	17.9
Qn5	14. This FC method was more interesting as compared to traditional class	0	0	23.1	43.6	33.3

read/write-kinesthetic. In a recent study, a significant portion of participants, half of them precisely, voiced agreement that teaching methodologies employed by faculty should cater to the varied needs of students, irrespective of their learning speeds and should ensure that the entire class progresses together. This sentiment resonates with findings by Ramnanan[6], reinforcing the importance of inclusive pedagogical practices.

Drawing insights from experiences with the flipped classroom model, 52.6% of students felt empowered to pace themselves through the course successfully. Nevertheless, learning course content at home presents its own set of challenges. Not all students possess the same level of learning aptitude, motivation, or preparedness for self-directed learning. Additionally, there's the potential perception among students that take-home content, such as pre-class preparation, holds less significance compared to in-class instruction[7]. Moreover, the efficacy of at-home learning is contingent upon the availability and accessibility of technology in students' homes. Disparities in technological resources may inadvertently exacerbate disparities in learning experiences among students.

These multifaceted considerations underscore the necessity of adopting flexible and inclusive teaching strategies that accommodate diverse learning needs and circumstances. Balancing the benefits of self-paced learning with the challenges inherent in asynchronous instruction remains a pivotal area for further exploration and refinement in educational practice. In today's landscape, medical education faces unprecedented challenges amidst the rapid advancements in medical sciences and the exponential expansion of knowledge within the field. However, this era also presents a ripe opportunity for leveraging technology to navigate these challenges effectively. The current generation of medical students stands as a testament to the digital age, proficiently wielding technological tools in their daily lives.

With the vast array of resources and innovations available, integrating technology into medical education has become not just beneficial, but essential. From immersive virtual simulations to interactive online platforms, technology offers diverse avenues to enhance learning experiences and facilitate mastery of complex medical concepts.

This technological integration not only caters to the preferences and aptitudes of today's students but also addresses the evolving demands of modern healthcare. By embracing digital tools, medical education can adapt to the dynamic landscape of healthcare delivery, equipping future practitioners with the skills and competencies needed to thrive in their careers.

In essence, technology serves as the cornerstone of modern medical education, empowering students to navigate the complexities of the field with confidence and proficiency. As we embrace the digital age, the integration of technology stands poised to revolutionize the way we teach and learn medicine, paving the way for a future generation of skilled and adaptable healthcare professionals. Following their exposure to flipped classroom teaching, a notable majority (combining those who agreed and strongly agreed, totaling 63.79%) reported a reduction in the time spent on traditional methods of learning, particularly self-study. This shift underscores the potential of flipped classrooms to streamline the learning process, optimizing students' study time and enhancing overall efficiency.

However, the adoption of flipped classroom methodologies necessitates readiness on both sides-the students and the explore novel approaches to learning and teaching, respectively. While flipped classrooms foster self-directed learning among students, it's essential to acknowledge that some learners may initially perceive the workload as overwhelming. Hence, a supportive environment that nurtures student autonomy and resilience is crucial for successful implementation.

Concurrently, instructors must undergo adequate training to effectively navigate the nuances of flipped classroom instruction. This preparation is paramount for maintaining engagement and managing the learning pace effectively. It's worth noting that instructors who harbor reservations or lack confidence in the new methodology may encounter challenges in adapting to its demands.

In essence, while the flipped classroom model presents promising opportunities for enriching the learning experience, its successful implementation hinges on the willingness of both students and instructors to embrace change, adapt and collaborate towards achieving educational excellence. Through mutual support and a commitment to innovation, the flipped

classroom can serve as a catalyst for transformative learning experiences in medical education and beyond.

CONCLUSION

Our research showcases a successful application of the flipped classroom (FCR) approach among undergraduate medical students, specifically for teaching physiology. Notably, this method led to enhanced student performance and garnered positive feedback. As educational landscapes evolve, it becomes imperative to embrace novel teaching methodologies that align with curricular reforms and the expectations set by the national medical commission. While our study primarily focused on histology sessions for first-year MBBS students, we recognize the need for broader exploration. Future investigations should extend the implementation of FCR methodology to other subjects within the MBBS curriculum. By doing so, we can continue to refine and adapt our teaching practices, ultimately benefiting both educators and learners alike.

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