Concept Posters as a Reflective Learning Tool in the Foundation Course of MBBS Graduates: Experiences from a medical college in Andaman and Nicobar Islands, India

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ABSTRACT

INTRODUCTION: The National Medical Council (NMC), Government of India, introduced the Foundation Course (FC) to orient first-year MBBS students to the medical programme. FC has gone through many changes since its implementation and needs to be evaluated to assess its impact. However, conventional assessments may fail to capture collaborative processes and reflective depth among students. This study evaluated the use of concept posters combined with reflective writing as a pedagogical tool within the FC at a medical college in the Andaman & Nicobar Islands (A & N Islands). **MATERIAL & METHODS:** A convergent mixed-methods study was conducted among 109 first-year MBBS students at a medical college in the Andaman & Nicobar (A & N Islands). Students were assigned to 10 demographically balanced groups and asked to collaboratively create and present concept posters on five FC modules. Assessment was done with a structured questionnaire as well as reflective follow-ups after concept poster presentation sessions. The reflective write-ups were assessed using the 'DEAL' (Describe, Examine, and Articulate Learning) framework. **RESULTS:** In most modules namely waste management and Basic Life Support (BLS); high alignment was seen between expected and perceived scores. Attitude, Ethics, and Communication (AETCOM)-related subdomains, such as communication and time management, however, showed significant discrepancies. Reflective writing revealed weak critical analysis but a clear expression of personal learning. **CONCLUSION:** Concept posters and reflective writing effectively facilitated collaborative and reflective learning in the FC, therefore supporting the objectives of Competency-Based Medical Education (CBME) of early professional identity development and competency integration.

KEYWORDS: foundation course, concept poster, reflective writing, CBME, medical education

INTRODUCTION

In 2019, the introduction of the Competency-Based Medical Education (CBME) curriculum by the National Medical Council (NMC) of India marked a landmark shift in medical education. The focus transitioned from training doctors solely for clinical competence to developing Indian Medical Graduates (IMGs) who are not only clinically proficient but also ethical and responsive to societal needs.[1] A crucial component of this new curriculum is the 'Foundation Course' (FC), which serves as a bridge to help students transition smoothly into professional medical training.[2]

At the time of its initial implementation, the FC was proposed as a four-week structured program, spanning across 180 hours, which includes not just lectures but skill development sessions like Basic Life Support (BLS), computer skills, and extracurricular activities such as sports.[3] Over time, the FC has gone through significant changes; newer themes like digital literacy, gender sensitivity, disability inclusion, interprofessional

education, and mental health were added, apart from varied teaching methods. With the latest amendment in 2023-2024, FC is restricted to 80 hours within 2 weeks.[4]

Several Indian studies support the relevance and acceptance of the FC, particularly when interactive and skill-based activities are incorporated. Studies from West Bengal and South India reported higher satisfaction and improved knowledge acquisition using participatory and reflective learning methods, and comparable preferences were noted for experiential learning sessions in New Delhi.[5-8]

Although previous studies report broad acceptance of the FC, most of the evaluations rely primarily on satisfaction surveys, providing limited insight into deeper engagement or competency development.[5-8] Few have explored the reflective and collaborative components central to Competency-Based Medical Education (CBME), and evidence from remote or resource-limited settings remains scarce. This study addresses these gaps by evaluating the FC through a mixed-methods design using concept posters and structured reflective writing to capture collaborative and reflective learning in a resource-limited context.

Concept posters followed by reflective writing were used to evaluate the depth and value of the FC beyond routine quantitative assessments. Concept posters enable students to creatively articulate abstract themes such as professionalism, ethics, and communication, while reflective narratives encourage introspection, critical thinking, and personal meaning-making.[9,10] Reflective writing was further evaluated using a structured framework to assess not only knowledge gains but also competency development.

MATERIAL & METHODS

Study setting and design

A convergent mixed-method study was conducted in September 2024 as part of the FC of first-year MBBS students (2024-2025 batch) in a tertiary care hospital and medical college of A & N Islands to assess the effectiveness of FC using a concept poster-based learning strategy.

Participants and sample size

As this is one of the first studies on the newly introduced 80-hour FC using a new assessment method, the sample size was calculated using the formulae: Z^2PQ/D^2, where Z=1.96 for 95% confidence level, P=baseline satisfaction for FC at 50%, Q=100- P, and D=5% absolute error, and for 80% power of the study as 385. This was further corrected for a finite population (111 students in the batch) to be 87 students. Using complete enumeration, all 111 students enrolled in the 2024-2025 batch were invited to participate. Of these, only 109 students consented to attend all the sessions and participated in all evaluations, and therefore, only data obtained from these 109 students were included in the assessment.

METHODOLOGY

All students attended a 2-week-long (80 hours) FC, which was curated by faculty members of various departments from the medical college. Table I shows the various components of the FC.

On the first day of the FC, the students were informed about the study, and informed written consent was obtained. They were divided into 10 demographically balanced teams (the first 9 teams had 11 members, and the 10th team had 10 members) based on gender, state region of origin and language spoken.

Each team was assigned to create a concept poster on one FC module, ensuring two posters per module across five modules. Sports and extracurricular activities were excluded from this activity due to the absence of structured teaching in that domain. Students collaboratively developed posters alongside the FC, incorporating key themes, visuals, and reflections. Defined roles such as leader, designer, presenter, and reviewer were given to each member in the team to ensure equitable participation.

Table I: List of modules and allocated hours for foundation course as per revised 2023-2024 Competency-Based Medical Education (CBME) guidelines

No.	Module Name	Hours Allocated
1	Orientation to the Medical Profession	15 Hours
2	Skills Module	15 Hours
3	Community Orientation and Field Visits	5 Hours
4	Professional Development including Ethics and AETCOM	20 Hours
5	Language/computer skills including Clinico-lab communication	10 Hours
6	Sports and extra-curricular skills	15 Hours
	Total	**80 Hours**

The students were asked to present the posters on the last day of the FC. They were then briefed about reflective writing and introduced to the DEAL (Describe, Examine, and Articulate Learning) framework with brief excerpts for examples. Each group took turns to present their respective concept posters, followed by a non-evaluator peer and faculty discussion.

The students were then asked to fill out a structured questionnaire consisting of 5 sections corresponding to 5 major domains and a total of 24 questions rated on a 5-point scale. This structured questionnaire was based on the FC module, and its face and content validity were assessed by 3 senior faculty reviewers from the Institutional Medical Education Unit (MEU) and underwent a pilot test on 5 students before being implemented in the study. As this questionnaire was based on FC, like other tools used in similar studies, the reliability of the tool was not quantified. The students also gave overall feedback about the FC, including the sports and extra-curricular module, using open-ended questions in the same questionnaire.

At the end of all the poster presentations, the students were asked to submit a reflective write-up, including, but not limited to, a description of their learning process throughout the FC, individual contribution to poster making, and any other relevant reflections, like on teamwork, professional development, etc.

Data analysis

The evaluation strategy was based on Kirkpatrick's Model (Level 1 and Level 2) for evaluation of health education intervention.[11]

i. Quantitative Data (Kirkpatrick Level 1 – Learner Reaction)

Quantitative data were entered in Microsoft Excel and were analysed using IBM SPSS version 29. For each of the 5 modules (excluding the sports and extracurricular module), expected and perceived scores were

calculated and expressed in mean ± standard deviation (SD). A paired t-test was used to assess differences between expected and perceived scores.

ii. Qualitative Data (Kirkpatrick Level 2 - Learning Outcomes)

A total of 26 writings were chosen by purposive sampling out of 109 total reflective writings based on diversity in gender, academic background, and expressiveness to ensure thematic richness analysis using Ash & Clayton's 'DEAL' framework (i.e., Describe, Examine, and Articulate Learning).[12] Data saturation was considered achieved when no new reflections emerged after analysing the 24th reflection. The feedback obtained from the open-ended question was assessed thematically by two independent reviewers using open and axial coding, manually, for varied student learning experiences and perceptions. Triangulation of data was done from both these sources to increase the comprehensiveness of reporting.

RESULTS

Out of the total 111 students who attended the FC, 109 consented to participate in the study and attended all sessions, including concept poster making, presentation, reflective writing, and quantitative and qualitative feedback activities. Table II shows the demographic characteristics of the participating students (n=109). The majority (54%) of students hailed from the Andaman & Nicobar (A&N) Islands. The remaining students came from 14 other states. 20.2% of the students had an immediate family member as a doctor, which may contribute to these students being better prepared for the medical curriculum. Of the total participants (n=109), 77% were females.

Table II: Demographic characteristics of the participants (n=109)

Item	Frequency (n)	Percentage (%)
Gender		
Male	25	(22.9)
Female	84	(77.1)
State of Origin		
A&N Islands	59	(54.1)
Andhra Pradesh	5	(4.6)
Bihar	6	(5.5)
Delhi	2	(1.8)
Haryana	5	(4.6)
Jharkhand	2	(1.8)
Kerala	4	(3.7)
Madhya Pradesh	1	(0.9)
New Delhi	3	(2.8)
Odisha	1	(0.9)
Punjab	2	(0.8)
Rajasthan	2	(1.8)
Tamil Nadu	4	(3.7)
Uttar Pradesh	9	(8.3)
West Bengal	3	(2.8)
Another immediate family member being a doctor		
Yes	22	(20.2)
No	87	(79.8)

Table III: Expected and perceived score outcomes for different modules in the foundation course (n=109)

Items	Expected Score (Mean ± SD)	Perceived Scores (Mean ± SD)	p value*
Orientation to the Medical Profession Module			
Rules and regulations of college	4.56 ± 0.74	4.64 ± 0.57	0.372
Overview of curriculum	4.60 ± 0.64	4.67 ± 0.55	0.387
Goals, roles, and competencies of Indian Medical Graduate (IMG)	4.71 ± 0.58	4.70 ± 0.57	0.898
History of medicine and alternative healthcare systems	4.48 ± 0.70	4.48 ± 0.63	1.000
National health policies and priorities	4.65 ± 0.62	4.69 ± 0.52	0.606
Skills Module			
First Aid	4.61 ± 0.73	4.55 ± 0.76	0.552
Basic Life Support	4.71 ± 0.49	4.72 ± 0.46	0.876
Universal Precaution	4.76 ± 0.45	4.75 ± 0.46	0.871
Waste Management	4.76 ± 0.45	4.78 ± 0.43	0.737
Immunization	4.72 ± 0.47	4.78 ± 0.44	0.331
Documentation	4.73 ± 0.48	4.73 ± 0.46	1.000
Community Orientation and Field Visits			
Community Orientation and Field Visit	4.5 ± 0.59	4.5 ± 0.59	1.000
Professional Development, including Ethics and AETCOM			
Communication	4.78 ± 0.46	4.08 ± 1.20	<0.001
Time management	4.70 ± 0.51	3.98 ± 1.22	<0.001
Professionalism & ethics	4.78 ± 0.44	4.06 ± 1.20	<0.001
Importance of mentoring	4.71 ± 0.52	4.04 ± 1.09	<0.001
Methods of self- directed learning	4.67 ± 0.52	3.96 ± 1.22	<0.001
Stress management & risk-taking behaviour	4.69 ± 0.54	4.01 ± 1.23	<0.001
Yoga and meditation	4.66 ± 0.64	3.97 ± 1.25	<0.001
Language/computer skills, including Clinico-lab communication			
Communication	4.74 ± 0.50	4.75 ± 0.46	0.878
Local language	4.69 ± 0.50	4.63 ± 0.54	0.395
English language	4.65 ± 0.54	4.65 ± 0.50	1.000
Computer skills training	4.43 ± 0.67	4.40 ± 0.69	0.745

As observed in Table III, in the *Orientation to the Medical Profession* module, expectations and perceptions were consistently high and closely aligned, with the highest concurrence for "Goals, roles, and competencies of the IMG" (4.71±0.58 vs. 4.70±0.57). Similarly, the *Skills Module* demonstrated strong concordance between expected and perceived outcomes. Core topics such as Universal Precaution, Waste Management, Immunization, and Documentation showed minimal differences, indicating that students found these sessions relevant and adequately delivered. The *Community Orientation and Field Visit* component showed identical expected and perceived scores (4.5±0.59), suggesting that field experiential learning activities fully met student expectations. In contrast, the *Professional Development, including Ethics and AETCOM* module, showed the largest expectation perception gaps. Despite high expectations (mean expected scores 4.66-4.78), perceived scores were significantly lower for Communication, Time Management, Professionalism & Ethics, Self-Directed Learning, Stress Management, and Yoga/Meditation ($p<0.001$). Finally, modules on Communication, Local Language, English Language, and Computer Skills largely met student expectations, with no significant differences observed.

Reflective writing analysis using the DEAL model

Ash & Clayton's DEAL model was used to examine 26 out of 109 reflective narratives from first-year MBBS students at ANIIMS. Three fundamental elements around which the model is organised are i) Descriptive Content, ii) Examination and Critical Thinking, and iii) Articulated Learning and Application. The goal was to gauge how much students interacted with these elements in their reflective writing under the FC.

i. Descriptive content

Of the 26 reflections, 10 (38.5%) successfully captured descriptive qualities, providing background information on what students observed, experienced, or participated in. Often, these stories covered community interactions, classroom activities, laboratory demonstrations, or hospital tours. *CP2: "During our visit to the pre-clinical and para-clinical labs, we observed various instruments, including microscopes and skeleton models. The facilitators explained their diagnostic value and relevance." CP14: "We visited the GB Pant Hospital. The general ward had patients who did not require urgent care, while the maternity and emergency wards had specialized staff and resources." CP20: "In the session on disability competency, I learned the importance of respecting and treating individuals with disabilities with understanding. It is crucial to use appropriate language and clear communication methods to ensure inclusivity."*

ii. Examination and critical thinking

Reflecting personal insights, rethinking assumptions, or more probing of healthcare systems, only 2 of 26 reflections (7.7%) showed significant interaction with the examine and critical thinking element, which could be due to failure to understand reflective writing practices during the orientation session. *CP7: "Overcrowding in hospital corridors and lack of patient seating made me question the equity of access and comfort in our healthcare delivery." CP2: "Time management, I realized, isn't just about scheduling but about prioritizing rest, study, and personal time to remain effective without burnout." CP19: "I learned that the healthcare system in India is divided into three levels-primary, secondary, and tertiary care. This made me reflect on how referral pathways impact patient outcomes, especially in rural areas."*

iii. Articulated learning and application

19 out of the 26 reflections (73%) effectively represented the most notable aspect, articulated learning. Students vowed future-oriented application of newly acquired knowledge to self-care, ethics, teamwork, and patient treatment. *CP8: "I plan to apply the roles of a communicator and lifelong learner by continuously updating my knowledge and being honest and empathetic with patients." CP11 "I will apply this knowledge to educate myself and others about disability-related issues and challenges, ensuring I can provide better care and support." CP16: "I will practice yoga and mindfulness to manage stress and stay mentally focused, ensuring I remain resilient in my medical career." CP3: "Understanding the history of medicine will help me communicate better with culturally diverse patients and dispel outdated myths around illness."*

Although the reflections showed students' capacity to express learning and intended future behaviours, they were especially lacking in the areas of critical analysis and descriptive storytelling, which could be due to a restriction in the number of hours allocated to each module, thereby affect the reduction of contact points of students with various health and allied health staff and infrastructure.

Qualitative feedback on the Foundation Course

Four main themes concerning first-year MBBS students' experiences and expectations from the FC emerged from the qualitative study of open-ended comments. The comments were grouped into the following themes using thematic coding:

i. Need for more hands-on and interactive learning sessions

Many students said they wanted more interactive and hands-on involvement during classes and visits. They suggest that participatory learning styles might improve retention of important concepts and thereby increase

their real-world readiness. *CP1: "More interactive sessions would help in understanding the topics better." CP10: "Include practical exposure and hands-on activities during lectures."*

ii. Greater emphasis on sports and extracurricular activities

Many students suggested more sports, extracurricular activities, and co-curricular involvement, which may be due to limitations in the existing sports infrastructure available within the institute. *CP8: "Add more sports activities and time for relaxation." CP15: "Focus more on extracurricular activities to keep the mind refreshed."*

iii. Reinforcement of professionalism and skill development.

Several students appreciated the professional orientation and skill-building components of the class and asked for further reinforcement. *CP13: "The foundation course has completely helped me to understand how a doctor should be and the roles we need to follow." CP 18: "It taught me to become an ethical and good doctor."*

iv. Course restructuring and time optimization

Frequently, the course framework's time management, including scheduling, pacing, and minimizing cognitive overload, was mentioned as a concern. *CP2: "Some sessions felt too long and could be made more concise." CP7 "We need more breaks and time for self-study."*

The students' feedback was largely positive, highlighting a preference for experiential learning and holistic development, while also underscoring the need for improved session design and scheduling.

DISCUSSION

This study assessed the use of concept posters as a reflective and collaborative learning tool within the FC for MBBS students under the CBME framework. While quantitative findings showed strong agreement between expected and perceived learning across most modules, the reflective narratives provided deeper insight into student engagement, application of learning, and perceived curricular limitations.

Core modules such as orientation to the profession, basic skills training (first aid, BLS), and community orientation largely met student expectations, demonstrating good alignment between curricular objectives and learners' perceptions. These findings were consistent with earlier studies from other medical colleges that used quantitative tools to evaluate FCs and reported similarly high satisfaction levels.[7,8]

However, the marked gaps observed in the *'Professional Development, including Ethics and AETCOM'* components; particularly in communication, time management, and stress-management subdomains, suggest limitations in teaching approaches and/or student receptiveness despite high expectations. Areas rooted in the affective domain requiring experiential and mentored learning are difficult to achieve within the limited contact hours of the FC.[9] This challenge may be further amplified in the Andaman & Nicobar Islands, where much of the teaching workforce comprises junior faculty who may lack formal training or awareness of the full range of available pedagogical tools.

The reflective writings analysed through the DEAL model added meaningful qualitative depth. Although only a few students engaged critically with wider systemic or societal issues, most could articulate their

concerns its practical application, particularly in ethics, stress management, and self-care. Low participation in the "Examine" stage likely reflects limited clarity on how to critically reflect on sessions and field visits.[12] In contrast, students more easily described their experiences and identified practical takeaways, suggesting that these components of reflection are more intuitive than deeper analysis, which may require structured mentorship and guidance.[10]

Consistent with earlier research demonstrating the value of group-based pedagogy and visual synthesis tools in early medical education, the concept poster activity fostered collaborative learning.[13,14] Group posters encouraged shared ownership and distributed leadership, supporting CBME goals of developing teamwork, communication, and professional responsibility from the outset.

The thematic analysis of open-ended comments highlighted students' preference for more interactive, hands-on sessions and greater emphasis on sports, extracurricular activities, and self-directed learning time. These findings reinforce the need for FC that are flexible, student-centred, and well-balanced. Continuous curriculum audit and responsive planning based on faculty and student feedback are also essential for effective implementation in line with recent NMC guidelines.[4]

The mixed-methods design of this study, which enabled an in-depth evaluation of the FC, is a key strength. However, reliance on self-reported reflections, the absence of a control group, and the exclusion of absentee students may limit the generalizability of the findings. In the unique geographic and cultural context of the Andaman and Nicobar Islands, the design and implementation of the FC may have been influenced by the institution's remote location, limited and floating faculty resources, and minimal educational infrastructure, making the findings more relevant to the newer peripheral district-hospital upgraded medical colleges compared to well-established institutions in tier-1 cities.

CONCLUSION

The use of concept posters as a reflective and cooperative tool in the Foundation Course shows strong potential to enhance student engagement, critical thinking, and early professional identity formation. Structured reflective writing further serves as an effective formative and assessment method, helping students internalize essential values and competencies of the Indian Medical Graduate. The study also highlights areas for improving the Foundation Course, including refining instructional approaches, adjusting time allocation for key competencies, and strengthening alignment between expected outcomes and teaching learning strategies.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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