



Original Article

The Role of Portfolio-Based Reflective Learning in Teaching the AETCOM Module to Second-Year Medical Students within India's Competency-Based Curriculum

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ABSTRACT

Background: India's Competency-Based Medical Education (CBME) curriculum mandates the development of an Indian Medical Graduate (IMG) proficient as a clinician, communicator, and professional. The Attitude, Ethics, and Communication (AETCOM) module is central to this goal but poses significant teaching and assessment challenges. This study evaluated the effectiveness of a structured portfolio in facilitating reflective learning and enhancing the appreciation of AETCOM principles among second-year medical students.

Methods: A descriptive observational study was conducted with 234 second-year MBBS students. Participants engaged in portfolio-based learning during clinical postings, documenting reflections on patient interactions, ethical issues, and 'tag-along' sessions with healthcare workers. Data were collected through analyzed portfolios, focus group discussions (FGDs), and validated feedback questionnaires on portfolio utility and knowledge/attitudes toward medical ethics.

Results: Students reported significant benefits: improved written communication (83%), enhanced self-directed learning (73.4%), and fostered self-reflection (74.6%). Portfolio analysis revealed profound student insights into patient perspectives, healthcare teamwork, and personal anxieties. Students successfully identified prevalent ethical issues in clinical settings, most commonly breaches in confidentiality (31.34%) and questions of beneficence/justice in treatment (25.37%). However, portfolio writing was perceived as stressful (81%), and students reported insufficient guidance (55.5%).

Conclusion: Portfolio-based learning is a powerful tool for operationalizing the AETCOM module, moving learning beyond theoretical knowledge to practical, reflective understanding. It successfully cultivates empathy, ethical reasoning, and professional attitudes. To ensure its success, institutional support through faculty development and better integration into the curriculum is essential **to mitigate student stress and maximize the tool's educational potential.**

Keywords: AETCOM module, Competency-Based Medical Education, Portfolio.

INTRODUCTION

In 2019, the National Medical Commission (NMC) implemented the Competency-Based Medical Education (CBME) curriculum nationwide, which revolutionized medical education in India. This reform's stated goal is to create a capable "Indian Medical Graduate" (IMG) who is a well-rounded professional who can serve as a clinician, communicator, leader, lifelong learner, and team member in the healthcare industry, rather than just a repository of knowledge. The Attitude,

Ethics, and Communication (AETCOM) module, a structured program created to instill the fundamental values of professionalism, ethical integrity, and effective communication, is essential to accomplishing this goal (Shah, 2021).

The authentic assessment of these competencies, which are developmental and process-oriented rather than content-centric, is a major challenge within CBME. The gradual development of these abilities is difficult for traditional summative tests to measure. As a result, the NMC has advised using logbooks and portfolios for ongoing observation and evaluation. A dynamic solution is provided by a portfolio, which the NMC defines as "a collection of learner's progressions in tasks and competencies – an evidence of events documented in the logbook" (Shah, 2021). By incorporating student reflections, it goes beyond a simple task checklist and offers a glimpse into the cognitive and affective journey of the learner, helping to consolidate gains and guide future learning (Shah, 2021) and (Charon, 1995).

Although didactic lectures can be used to introduce the concepts of AETCOM, real-world application is necessary for their internalization. Students can recognize moral conundrums, relate to patients and families, and comprehend team dynamics by using portfolios to require reflections on actual clinical encounters. This enhances the effectiveness and depth of the learning process (Charon, 1995) and (Sivalingam, 2007). Portfolios are still rarely used in undergraduate medical education, especially in Asian and Indian contexts, despite their widely acknowledged advantages (Shah, 2021).

The drive of this study was to close this gap. Through reflective learning during their initial clinical exposures, it seeks to assess how well a structured portfolio aids second-year medical students in understanding and internalizing the AETCOM module's principles.

MATERIALS & METHOD

Study design & Setting: A descriptive observational study was performed for two months (August 1 to September 30, 2024) at a medical college in India.

Participants: The study comprised a cohort of 250 second-year MBBS students. After a thorough explanation, 234 students who gave their informed consent, regularly submitted their portfolios, and actively participated in all study components (tag-along sessions, FGDs) were included. The average age of the people who took part was 20.1 ± 1.7 years. There were 146 women (62.5%) and 88 men (37.5%).

Intervention and Data Gathering: The NMC's AETCOM module for the second year was taught using a mix of lectures and hands-on activities like brainstorming, role-playing, and case studies. The main part of the intervention was putting in place a structured portfolio with two main parts (Ozcakar, 2009).

1. **Practice-related:** Getting students to think about what they learned (knowledge, skills, attitude), how they feel, and what they can do better.
2. **Patient-related:** Helping students write down demographic information and think about the patient's point of view ("If I were the patient...") and ways to prevent illness and promote health.

Students took part in two important activities to build their portfolios:

1. **"Tag-along" sessions:** Students followed healthcare workers (doctors, nurses, technicians) around, watched how they interacted with each other, interviewed them, and wrote stories about their experiences, focusing on teamwork and professional roles.
2. **Identifying ethical issues:** Each student had to find one ethical issue they saw in the outpatient or inpatient department during their month-long clinical postings and write it up in their portfolio as part of a case write-up.

The experiences from the portfolios were then discussed in Focus Group Discussions (FGDs), and role-plays were performed to further explore the ethical and professional concerns that were found.

Research Tools and Evaluation

1. **Structured Portfolio:** Functioned as the main source of data and a tool for reflection (Ozcakar, 2009).
2. **Portfolio Feedback Questionnaire:** Students' opinions of the portfolio's usefulness, influence on learning, and related difficulties were evaluated using a 22-item questionnaire (Elango, 2005).
3. **Medical Ethics Feedback Questionnaire:** This validated instrument evaluated students' medical ethics knowledge, attitudes, and practices (Chandrashekhar, 2014). This questionnaire's high reliability was indicated by its Cronbach's alpha of 0.901.

Descriptive statistics were used in the data analysis of quantitative questionnaire data. Key learning moments, emotional reactions, and comprehension of ethical principles were identified through a thematic analysis of qualitative data from portfolio reflections.

RESULTS

Goal 1: To evaluate students' understanding, disposition, and abilities acquired via reflective writing.

Important developmental outcomes were found through the examination of portfolios and feedback surveys.

Quantitative Feedback: Table 1 indicates that a significant portion of students concurred that the portfolio enhanced their ability to write (83%), promoted introspection (74.6%), and supported self-directed learning (73.4%). The majority (73.4%) thought it was a helpful extra learning resource.

However, most also reported a lack of proper guidance (55.5%) and found the process stressful (81%).

Table 1: Medical Students feedback on reflective writings in Portfolios (Elango, 2005). (Questionnaire)

Item	Agree Number (%)	Disagree Number (%)
1. I enjoy writing the portfolio	93 (39.9)	141 (60.1)
2. I can appreciate that my written communication has improved	194 (83)	40 (17)
3. It has helped me in self-directed learning as I can analyze problems on my own	172 (73.4)	62 (26.6)
4. Reviewing others' portfolios is very useful	162 (69.2)	72 (30.8)
5. Writing the portfolio is a stressful process	190 (81)	44 (19)
6. Writing the portfolio has helped my personal and professional development	165 (70.4)	69 (29.6)
7. While I write the portfolio, I usually think about the case	218 (93.0)	16 (7)
8. The portfolio encourages self-reflection	175 (74.6)	59 (25.3)
9. I normally write the portfolio on a daily basis in day today posting	133 (56.7)	101 (43.4)
10. There is adequate guidance to write the portfolio	104 (44.5)	130 (55.5)
11. I use resources other than textbooks to write the learning issue	203 (86.7)	31 (13.3)
12. I have started to use the same principle (of writing the portfolio) in problems that I encounter in day-to-day clinical exposure	133 (56.7)	101 (43.4)
13. Writing the portfolio has given mean insight into outcome-based education	118 (50.4)	116 (49.7)
14. The portfolio should be part of every medical programme	121 (51.8)	113 (48.3)
15. I usually reflect on the problems that I am discussing	175 (74.6)	59 (25.3)
16. The portfolio is a useful additional learning tool	172 (73.4)	62 (26.6)
17. I usually read the relevant chapter in books before I write the portfolio	172 (73.4)	62 (26.6)
18. The portfolio has changed the way I think when I encounter problems	96 (40.8)	138 (59.1)
19. The portfolio writing has changed my approach to learning	162 (69.2)	72 (30.8)
20. Writing the portfolio has helped me to monitor the learning goals	93 (39.9)	141 (60.1)
21. Writing the portfolio has helped me to recognize my strength and weakness	133 (56.7)	101 (43.4)
22. Writing the portfolio has helped me to revise my work	204 (87.2)	30 (12.8)

Qualitative Findings (Reflections for the Portfolio): Nervousness and Initial Patient Contacts: Students publicly expressed their anxiety. One student wrote: "I was initially both excited and nervous when I saw my first patient, a 4-year-old child. Every exercise is an adventure. "Meeting a patient for the first time as a medical student causes distress and anguish," another person observed.

Communication Skills: Critical self-awareness was evident in reflections. "I realized that I often interrupt patients," a student noted. I should listen intently, refrain from interrupting, and pose more open-ended questions.

Healthcare Teamwork: Students developed a greater understanding of the value of interdisciplinary cooperation. One story concluded, "I realized that health-care is team work," and characterized the intensive care unit as a centre of

collaboration. We cannot accomplish this on our own. Another person thought about how a pathology technician can help patients feel less anxious and realized how important it is to deal with their emotions. Deep empathy was evoked by exercises that asked participants to imagine the viewpoint of the patient, particularly with regard to the family's experience of illness, which is powerfully reflected in COVID-19 writings.

Goal 2: Assessing the understanding of fundamental medical ethics.

Every one of the 234 students was able to recognize and consider an ethical dilemma. The following were the most prevalent problems (**Table 2**):

Table 2: Common ethical issues identified by students in out-patient & in-patient departments.

Sl. No	Ethical issue	Number (n)	Percentage (%)
1	Confidentiality	73	31.34
2	Beneficence & Justice (giving treatment)	59	25.37
3	Problems related to Communication skills	35	14.9
4	Attitude of healthcare worker	28	11.94
5	Doctor's autonomy	17	7.46
6	Informed consent	14	5.97
7	Honesty (Issue of medical sick leave)	08	3.41
		234	100

1. **Breach of Confidentiality (31.34%):** Usually brought on by several medical professionals seeing patients in the same space.

2. **Beneficence/Justice (25.37%):** Mostly related to prescribing antibiotics improperly. 38.23% of students disagreed with the prescription because they believed the patient was not ill, according to additional analysis of these cases (**Table 3**).

Table 3: Ethics of Beneficence (giving treatment) - the students' opinion and judgment.

	Beneficence & Justice (Inappropriate prescription of antibiotics)	No (n)	Percentage (%)	Reasons quoted
Agree with the doctor	Yes	14	23.52	Patient is genuinely ill
	No	22	38.23	Patient is not ill. Doctor should not prescribe antibiotics
Disagree with the doctor	Yes	16	26.47	Doctor is pressured by Patient. Patient is not ill. Doctor should not prescribe antibiotics
	No	07	11.76	Patient is ill and infectious
Total		59	100.0	

Students' ability to recognize and evaluate ethical conundrums in clinical practice was validated by the exercise.

Knowledge and Attitudes on Medical Ethics: The results of the questionnaire (**Tables 4, 5, 6**) revealed that although almost all students (98.19%) were familiar with the Hippocratic Oath, their understanding of other important documents, such as the Helsinki Declaration (27%) and ICMR guidelines (35.1%), was lacking. The majority of students (73.9%) believed that ethical knowledge was somewhat significant. Most people had positive opinions; 81.98% opposed charging wealthy patients more to help the poor, and 91% opposed the idea of sacrificing confidentiality. Regardless of patient opinion, 73.87% of respondents continued to hold the belief that "doctors know best." The majority of students (36.03%) would approach their department head if they were faced with an ethical dilemma.

Table 4: Medical Students knowledge on Medical ethics (Chandrashekhar, 2014)
(Feedback Questionnaire)

Do the students know the main contents of	Statement response	Number	Percentage (%)
1. Hippocratic oath	Yes	207	98.19
2. Nuremberg code	Yes	95	40.5
3. ICMR guidelines	Yes	82	35.1
4. Helsinki Declaration	Yes	63	27

5. How important is knowledge of ethics to you in your work?	Very	53	22.5
	Moderately	173	73.9
	A Little	4	1.8
	Not at all	4	1.8
6. Do you entertain patients' questions during their visits?	Yes	198	84.7
	No	36	15.5
7. How often do you come across any ethical issues?	Daily	71	30.36
	Weekly	42	18.01
	Monthly	47	19.81
	Yearly	74	31.53
	Never	00	00
8. How often do patients ask you about their diagnosis?	Never	04	1.8
	Seldom	84	36.03
	Always	145	62.16
9. How often do you discuss your daily cases with your colleagues?	Seldom	84	36.03
	Always	150	63.96
10. How did you acquire your knowledge of bioethics?	During training	06	2.7
	Experience at work	17	7.2
	Lectures	190	81.08
	One's own reading	08	3.6
	Internet, newspapers etc.	13	5.4
11. Have you attended training in bioethics	Yes	234	100
	No	-	0
12. Have you taken informed consent?	No	-	0
	Verbal	-	0
	Signed	234	100
13. Is there an ethics committee in your institution?	Yes	230	98.19
	No	-	0
	Not sure	4	1.8
14. Does your institute have separate committees for reviewing animal and human research projects?	Yes	32	13.5
	No	63	27
	Not sure	139	59.5

Table 5: Medical Students attitude towards Medical ethics (Chandrashekhar, 2014)
(Feedback Questionnaire)

Attitudes		N	Percentage %
1. Doctors know the best irrespective of patients' opinion	Agree	173	73.87
	Disagree	61	26.12
2. Patient should always be informed of wrongdoing	Agree	188	80.18
	Disagree	46	19.86
3. Patients' wishes should always be adhered to	Agree	152	64.86
	Disagree	82	35.13
4. Confidentiality cannot be maintained in modern care and should be abandoned	Agree	21	9
	Disagree	213	91
5. Consent is required only in case of operations and not for tests and medications	Agree	89	37.83
	Disagree	145	62.16
6. Certain medical practitioners charge more from rich patients to compensate for treating the poor, do you agree with this?	Agree	42	18.01
	Disagree	192	81.98
7. Ethical conduct is important only for avoiding legal action	Agree	21	9
	Disagree	213	91

Table 6: Responses Regarding Practice of Medical ethics (Chandrashekhar, 2014)
(Feedback Questionnaire)

Practices	Tick the appropriate response	
	N	Percentage (%)
1. When people holding certain religious beliefs refuse to take blood, undergo surgery or accept treatment, what is your stand?		
Respect the patient's decision	145	62.16
Try to perform the procedure forcibly	--	----
Refer to a doctor who shares the patient's beliefs	61	26.12
Any other (specify): Try to convince	27	11.71
2. If you encounter any ethical problem, who will you approach?		
Colleague	25	10.81
Supervisor	46	19.81
Head of department	84	36.03
Ethical committee	63	27.02
Professional association	04	1.80
Priest	08	3.60
Textbooks, Internet	21	9.00
Close friends/Family	17	7.20

Goal 3: To determine obstacles and remedies.

The perceived stress and strain of portfolio maintenance was the main obstacle. To increase engagement, students recommended shorter, case-based, and more interactive sessions. Role-plays, case studies, and video clips based on their portfolio narratives were the most well-liked teaching strategies.

DISCUSSION

This study shows that a very successful pedagogical approach for integrating the AETCOM module into the CBME framework is portfolio-based reflective learning. It effectively closes the gap between academic understanding and real-world application, encouraging the growth of professional abilities, ethical reasoning, and empathy at a critical early point in clinical exposure.

Our results are consistent with previous research. Similar to the findings of (Table 7) (Elango, 2005), the portfolio's usefulness for enhancing communication and self-directed learning has been well received. In a similar vein, (Pitkälä & Mäntyranta, 2004) have extensively documented the expression of anxiety during initial patient encounters, and our research indicates that the portfolio offers a secure means of processing these feelings.

Table 7: Comparing our study regarding portfolio with Elango S et al.⁵

Sl. No	Statement	Elango S et al. Study (Agree)	Our Study (Agree)
1	Portfolio was useful as an additional learning tool	64.5%	73.4%
2	I can appreciate that my written communication Has improved	72%	83%
3	Writing the portfolio has helped my personal and Professional development	63.1%	70.4%
4	Writing the portfolio has helped me to recognize my strength and weakness	60.8%	56.7%
5	It has helped me in self-directed learning as I can analyze problems on my own	64.5%	73.4%
6	The portfolio writing has changed my approach to learning	42.7%	69.2%
7	Portfolio writing should be part of every medical programme	48.3%	51.8%
8	Writing the portfolio is a stressful process	93%	81%

The aptitude of second year students to recognize and evaluate intricate ethical dilemmas is a noteworthy discovery. In contrast to the study by Loh & Nalliah (2008), which found that honesty issues were the most prevalent, the pattern of issues found (beneficence, confidentiality) suggests that contextual factors influence ethical exposures. This demonstrates the importance of the portfolio in establishing ethics education in practical, local contexts as opposed to theoretical ones.

But the study also identifies important obstacles. The sustainability of this approach is seriously threatened by the high levels of stress experienced by students and their perception of insufficient guidance. These results highlight the urgent need for strong faculty development and are in line with other studies (Elango, 2005) and (Haffling, 2010). Teachers need to be trained in providing insightful feedback on reflective writing in order to shift from being merely information providers to facilitators of reflection.

Additionally, despite the AETCOM module, there are still gaps in knowledge about important ethical guidelines (ICMR, Helsinki), which suggests that these areas require more targeted and evaluated content. There is a need to demystify the function of ethics committees and incorporate clinical ethicists into the training environment, as evidenced by students' propensity to turn to department heads rather than ethics committees when faced with problems (Chandrashekhar, 2014).

CONCLUSION

The Portfolio is a transformative learning tool that enables students to become reflective practitioners and is much more than just a required document for CBME. This study offers compelling proof of its effectiveness in instructing the AETCOM module, allowing students to gain a profound understanding of the ethical and humanistic aspects of medicine. The process needs institutional commitment on a systemic level in order to reach its full potential. This comprises:

1. **Faculty Development:** Educating educators to be proficient mentors and advisors in reflective practice.
2. **Curriculum Integration:** To reduce stress, strategically incorporate portfolio work with allotted time and cut down on unnecessary workloads.
3. **Strengthening Ethics Education:** Improving the instruction of particular ethical principles and elucidating the function of hospital ethics support systems.

By tackling these issues, the portfolio can in fact contribute to the development of the capable, kind, and moral Indian medical graduate that the CBME curriculum aims to produce.

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