

The Promising Role of the Logbook and Portfolio in the New Competency Driven Medical Curriculum in India

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Abstract

The competency driven medical education has been introduced in all the colleges of India since 2019. It is mandatory for the students to maintain a logbook under this curriculum, and the use of an annexure to logbook or a portfolio has been recommended. In this paper, we describe the rationale behind using a logbook and portfolio, the differences between the two, the process of implementation, how to assess these, the challenges, the ways to overcome them, and the potential advantages of having such a system in place for various stakeholders. Feedback and reflection are the two processes that will need careful attention to ensure a meaningful implementation of this new introduction.

Keywords: logbook, portfolio, competency-based curriculum, reflection, feedback, assessment

Introduction

Why introduce a logbook or portfolio?

The competency based medical education (CBME) has been implemented across all medical colleges in India since 2019. The purpose is to produce competent Indian Medical Graduates who fulfil the roles of Clinician, Communicator, Life-long learner, Professional, and Leader and member of a health-care team (Medical Council of India, 2018). For this to happen, certain pre-defined global competencies and subject-wise competencies must be attained by the students as they move through the curriculum. This requires a paradigm shift in the way the students are assessed.

First, assessment needs to be carried out at the higher levels of the Miller's pyramid of attaining competence (Miller, 1990), i.e., at the 'Shows how' and 'Does' level. Second, the assessments ought to be criterion-referenced rather than norm-referenced, meaning that each student requires to attain all the competencies as per pre-defined criteria. Simply performing better than the other students may not suffice. Third, formative assessments with feedback ought to happen at regular intervals in order to shape the students'

learning in the right direction (Lockyer et al, 2017).

It is not possible to assess all the competencies at the summative examination, probably not even during the internal examinations. We need to have a continuous system of monitoring and assessment. The way in which the students attain the competencies, incrementally, on a day-to-day basis needs to be assessed. We need to keep a close track of how much and how well they progress, not only to be sure of moving ahead only after a certain level has been achieved, but also to take the right steps at the right time if a certain level has not been achieved. The National Medical Commission has mandated the use of a logbook for this purpose. The use of an annexure to logbook and/or portfolio has also been recommended (Medical Council of India, 2019).

Logbook and portfolio: are they the same? What is the difference?

Logbook

A logbook is defined as 'a book in which someone records details and events relating to something, for example a journey or period of their life' (Collins English Dictionary, 1994). Historically, a logbook was used to record readings from the log in order to determine the distance a ship travelled within a certain amount of time. The readings were recorded at equal times to determine the distance a ship travelled in a certain amount of time.

Applied to medical education and for the purpose of CBME, it has been defined as 'A

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verified record of the progression of the learner documenting the acquisition of the requisite knowledge, skills, attitude and/ or competencies (Medical Council of India, 2019). Thus, a logbook is a list of events/activities/accomplishments related to the student, verified and documented as and when they occur. It would serve as a record of the progress made by the student.

Portfolio

A Portfolio, on the other hand, is defined as ‘a collection of material, made by a professional that records, and reflects on the key events and processes in that professional’s career’ (Paulson et al, 1991). They have been commonly used in the fields related to arts, fashion, design etc. This is because it is not only the end product, but the process followed in achieving the end product and the learning there-from which is considered of great value. The same applies to medical education. A lot of learning happens in the journey taken to arrive at the final destination. And it’s important to pay

attention to the details of the journey to maximise and enrich this learning.

Maintaining a portfolio gives this opportunity to the learner. It will have elements of the logbook plus the evidence of learning in the form of students’ reflections. This helps in consolidating the gains and gives directions for future learning. For the purpose of assessment, it goes beyond being a snapshot of the milestones achieved, to giving a glimpse of the process of learning that the student has followed. While it is not mandatory, it is desirable to maintain a portfolio- which the National Medical Commission has defined as ‘a collection of learner’s progressions in tasks and competencies- an evidence of events documented in the logbook (Medical Council of India, 2019)’. Student’s reflection would form an integral part of the portfolio. Table 1 summarises the similarities and differences between a logbook and portfolio.

Table 1: Logbook and Portfolio: Differences and Similarities

Logbook	Portfolio
<ul style="list-style-type: none"> • Provides evidence of having been through a learning experience • Enlists what all learning activities have been performed • Records the tasks done leading to competency development 	<ul style="list-style-type: none"> • Provides evidence of having learnt from that experience • Describes how learning has happened through those activities • Records the students’ reflections on those tasks
<p>Similarities: Both serve as a longitudinal record of learning, providing an opportunity for formative assessment.</p>	

How to implement the process of maintaining a logbook or portfolio?

Logbook

Detailed guidelines for the implementation of a system of maintaining logbooks based on the principles of formative assessment have been suggested (Medical Council of India, 2019). All the competencies in each phase and subject that are at the ‘Performance’ level of the Miller’s pyramid must be entered in the logbook. In addition, we may also have the student record selected psychomotor and communication related competencies, specific clinical or laboratory experiences, participation in group activities, community experiences, field visits etc.

The student would record such activities in the logbook, get them verified, graded and signed by the teacher. If there is any gap in learning, it

will be identified and addressed promptly- for each and every student; rather than having it known at the time of later assessments, that too, if at all. The logbook, will thus ensure that everyone stays on track and continues to progress.

Portfolio

Going a step further would mean that the student maintains a portfolio. So, the student will not only record the learning activity, but also reflect on the learning that happened. The portfolio will thus be a unique, personal document of the trajectory of learning of each student.

Several hypothetical examples of logbook and portfolio entries of various learning activities performed by the student corresponding to different domains of learning, competencies and roles are as shown in Table 2.

Table 2: Examples of entries made in Logbook and Portfolio

Logbook (Activity)	Portfolio (Students' reflections corresponding to the activity)
Visit to the medicine ward to see adverse drug reactions	"I saw a patient who had a rash following drug administration. Anti-histamines were given, but the condition worsened and the skin kept coming off. A specialist opinion revealed the diagnosis of SJ syndrome. I realised that it is not appropriate to pass off all rashes as drug rash and a more careful follow-up is needed."
Small group discussion on importance of communication skill	"I realised that I often interrupt others while they are talking and jump to leading questions to quickly gather important information. Now on, I should ask more open-ended questions and listen carefully with good eye-contact"
History taking during Clinical posting in Psychiatry	"The patient was suffering from depression. But her presenting complaints were headache, feeling tired, and inability to concentrate. On gentle probing, she talked about persistent depressed mood and death wishes. I realised patients may be uncomfortable talking about personal feelings, may not be even aware they should be telling these to the doctor. I need to ask specific questions in the right manner to make a clear diagnosis"
Visit to a primary health care centre	"I saw the medical officer referring a diabetic patient to the surgery department of a tertiary health care centre for toe gangrene. He had been walking bare feet, had developed injuries since some time, but did not feel the need to consult earlier. I realised how health education can play such an important role in reducing personal suffering and cost of care. Had the patient known and practised basic foot care, this would not have happened."
Participated in a role play for taking informed consent for surgery	"I explained everything about the surgery, pros and cons, the prognosis and risks. I also addressed queries and got the signature. While signing, the (role-playing) patient mentioned that he was anxious about the surgery. I just hastily said 'Don't worry, everything will be alright.' I think it was quite superficial and partly dishonest. I had just explained the risks. Perhaps I was uncomfortable in dealing with the patient's anxiety. May be, I should have told him it's ok to be a little anxious, and allowed him to talk more about it. I need to learn to address the patient's emotions in a better way."
Visit to the child guidance clinic	"I saw a 9-year-old male child brought by his mother for deteriorating academic performance. He could not read fluently and made several spelling mistakes in writing even his own address. He could not solve simple math problems. His mother told he could understand everything very well, and could even tell orally, the answers to various questions. On testing, his performance IQ turned out to be normal. I realised that not all children who can't perform academically are intellectually disabled. I came to know about learning disabilities, regarding which I need to read more."
Attended a round in the Medical ICU	"I saw critically ill patients being continuously monitored. Consultants reviewing lab reports, nursing staff checking I/V lines, tubes, catheters etc, the cleaner disinfecting the floor, the resident doctors completing the documents, chest physiotherapy being given to a patient by a physiotherapist, the dialysis technician doing his job, dietician taking notes for various patients, various specialists being informed about referrals needed, and finally the relatives being informed about the patient's current condition. I realised that health-care is team work. I can't do it alone. I need to learn how to lead a team and ensure that all the team members do their job well to ensure best patient outcomes."
Visit to the District Tobacco Control Cell to understand the functioning of the National Tobacco Control Programme	"The counsellor was explaining to the patient he should stop smoking. He was being treated for tuberculosis for the second time. The patient knew about all the hazards and the counsellor said he had been trying hard but he just wouldn't quit. I was annoyed at first, but later thought there might be a lot of gap between knowing that something was harmful and being able to actually get rid of it. Life-style changes may be very difficult to implement. I must learn some techniques to enhance motivation for making healthy life-style changes"
Observed eye examination procedures	"I was observing how a slit-lamp examination is done. And the teacher said the patient had a KF ring. I saw it. She explained it was a sign of Wilson's disease. The history of the patient in the referral note from medicine department revealed he was suffering from convulsions not responding well to anti-epileptics, and had recently developed hand tremors. I then read about Wilson's disease. I came to know; it can present even without any liver related symptoms. I realised how a judiciously advised and non-invasive investigation can help in clinching the diagnosis."

Through these examples, we see that while logbook entries attest that certain activities have been performed by the student, the reflective entries in portfolio make the learner go beyond the learning that is obvious, to developing new insights, and learning plans based on them.

How to assess?

The assessment using a logbook or portfolio would be longitudinal in nature. It would involve expert subjective judgement and giving developmental feedback to the students. It would be highly authentic as it would be based on direct observation of students' performance(logbook) or the evidence of their learning from real life experiences(portfolio). As it would be an ongoing record of a large number of actual learning experiences of the students, reviewed and graded by multiple subject experts, the inference drawn regarding the students' learning outcome would be highly valid and reliable (Joshi et al, 2015)

Logbook

Each activity documented in the logbook would be graded as per the criteria 'below expectations, meets expectations, or exceeds expectations' by the teachers. This should be followed by feedback and remedial action, if needed (Medical Council of India, 2019). It would be the task of the subject experts of each department to devise the criteria of grading in this manner for each activity corresponding to the competencies related to the particular subject. It is mandatory for the student to complete the logbook in order to be eligible for the summative examination. Also, 20 percent marks for internal assessment shall be from the logbook (Medical Council of India, 2019).

Portfolio

A portfolio is a great measure of self-assessment. It can also be used for formative assessment where a teacher or mentor would provide feedback and guidance for further learning. Additionally, it could also be used for summative assessment. Some courses are designed in a way that a portfolio is used to document what the student has learnt, and there are no separate summative exams. The assessment is then focused on deciding on the basis of the portfolio whether the learning outcomes based on the pre-defined competencies have been met or not.

If such a system is to be followed, the structure of the portfolio shall have to be standardised. It should be assessed by a group of assessors who have been trained in qualitative assessment and grading of reflections. Also, a formal meeting may be required between the student and the assessors in which the student could present the portfolio, a brief summary of the course of learning and key achievements, and the assessors can seek clarifications if needed (Friedman *et al*, 2001).

What are the challenges and how to overcome them?

Logbook

Apprehensions are that it may become a mere formality- a 'tick-mark' exercise, there might be variability in grading the students by different teachers, and it may become too stressful or time-consuming for both students and teachers.

To overcome these, both the teachers and students should be sensitised to the purpose and use of the logbook in the context of CBME. Teachers are being sensitised as a part of various faculty development programmes being conducted across the nation. It would be good to sensitize students during the foundation course, explaining to them the purpose of the logbook and their role in learning and receiving feedback from their teachers. In the colleges that have a mentorship programme, the mentors might play a role in explaining it to the students.

Faculty training and deliberations at the departmental level may help in reducing the variability in grading. Involvement of all the teachers of a department in assessing and giving feedback would enhance the reliability and educational impact of such assessment. Also, if the process of logbook entries is streamlined and embedded with ongoing activities, rather than being kept aside as a separate task, it would not be perceived as stressful or time consuming. It would effortlessly fall in place over a period of time (Gouda, 2016)

Portfolio

To start with, the challenge would be to explain the purpose of having a portfolio to the students. Next, they would have to be supported in creating a portfolio, the contents of which correspond to the learning objectives. It would require persistent effort and commitment to write reflections on key experiences. Also, there might be concern over originality and

authenticity of the material presented in the portfolio (Kumar & Shastri, 2018). The students may feel the pressure of showcasing only the best things in the portfolio, making it very attractive, putting in too many things etc. because of the fact that their portfolio would be reviewed by the teachers (Challis, 1999). Teachers may also find it difficult to assess a portfolio, which is different for each student, unique, and having a lot of qualitative data.

The way to overcome these issues is that both students and teachers familiarize themselves with the use of Portfolio. Mentors may guide the students in the process of portfolio development. It should be clear to students that the purpose is to enable them to take more responsibility of their learning by way of reflection. It would serve as a self-assessment tool, helping them form their future learning goals. The focus should be on quality rather than quantity; on the richness of content rather than the beauty of presentation. The teachers, while reviewing the portfolios must focus on helping the students in identifying their strengths, thereby reinforcing them, and in formulating their learning goals for deeper learning (Friedman *et al*, 2001).

What are the examples of implementation?

At the undergraduate level, Sahu SK and colleagues (Sahu *et al*, 2008) from Pondicherry report their experience of using a portfolio in community-based field curriculum. The students maintained a portfolio for the Family Health Advisory Programme under which they were supposed to visit a family in the community on a weekly basis for 3 months. During the programme, they were supposed to identify the problems and health needs of the family and give health education. The authors report that portfolio-based learning and assessment was an improvisation over record-based learning followed for this programme and it was received well by the students. They were clearer about the objectives of the programme, and found the portfolio-based learning useful to them and to the families they visited.

Reyes D and colleagues (Reyes, 2019) from Chile introduced portfolio-based learning for clinical cases for 4th year medical students as a teaching-learning innovation, and studied its educational impact after 10 years of implementation on a total of 1320 students. The students reported that they developed critical thinking, clinical reasoning and professionalism as a result of the portfolio. All the students got excellent final grades due to periodic feedback

and learning assessment. Fifteen evidence-based medicine articles and 2 books with 52 narrative essays were published as a result of the work done around the portfolio. What started as a teaching innovation later evolved to become an established and continuous assessment tool. It is noteworthy that only 2 cases of plagiarism were reported for which appropriate disciplinary action was taken.

A systematic review done by Ahmed 2018 revealed that the use of reflection in portfolios maintained by the medical undergraduates was associated with improvement in communication skills, professionalism, experiential learning and better achievements at the post-graduate studies (Ahmed, 2018)

These examples show the potential benefits of introducing such a system of teaching-learning and assessment. Over the years, we shall have to evaluate the programme that we incorporate, take feedback from various stake-holders and continue to improve upon it.

What will need careful attention for meaningful implementation?

Feedback

The essence of formative assessment is in the feedback process between students and teachers. Feedback is defined as 'the information describing students' performance in a given activity that is intended to guide their future performance in that same or in a related activity (Ende, 1983). This information should contain positive reinforcement for work done well, so that it is repeated and becomes habit; and constructive feedback to correct the mistakes made. There are various models and ways of giving feedback described in the literature (Jug, 2019).

The contemporary view of feedback is that it is a process that is shared by the teacher and the student, and not a uni-directional information from teacher to student. It is based on a relationship between teacher and student of trust and a sense of shared goals (Telio *et al*, 2015 and Sargeant *et al*, 2015).

What is important is that a learning environment is created such that students look forward to feedback and perceive it as an opportunity for growth, rather than be afraid of it and perceive it as criticism. Students must also be actively involved in the feedback process, encouraged to think about their own performance and

identify what went well and what did not; eventually making a future action plan based on it. Then the effects of the feedback would go beyond the learning task to gradually building a sense of professional identity in the students (Molloy et al, 2020).

Reflection

Reflection is defined as ‘a cycle of paying deliberate, systematic and analytical attention to one’s own thoughts and actions, feelings, thinking and in relation to particular experiences for the purpose of enhancing perceptions of and responses to current and future experiences’ (Al-Shehri, 1995). Reflection leads to the development of critical thinking that is vital for clinical practice. It turns experience into insight. While we go ahead with the idea of introducing reflections as a regular practice for our

students, it is important that we teach them the art of reflection.

If we follow the Rolfe model of reflecting (Rolfe, 2001), with the questions ‘What happened, so what and what next?’, we must ensure that the students understand that the essence lies in the answers of ‘so what’ and ‘what next’. This has been shown in Figure 1, which has an inverted triangle and straight triangle to illustrate a superficial and deep reflection, respectively. In a superficial reflection, the majority of the content would be under the section ‘What happened’, followed by ‘So what’, and very little content in the ‘What next’ section. In a deep, meaningful reflection, it would be the other way round (Figure 1).

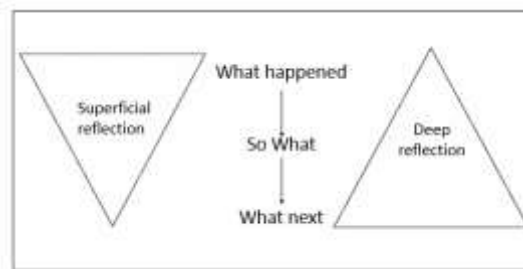


Figure 1: Superficial versus Deep Reflection

As the students begin reflecting, they may just end up writing a descriptive narrative of the event as reflection, occupying largely the ‘What happened’ section. It should be explained to them that reflection is not merely revising in the mind, mechanically, the chronology of events that occurred. It is about thinking what was it about the whole event/experience that mattered the most to them, that touched them or made them think or feel something different. This aspect would be different for each learner and should be the starting point of reflection, building on to the significance of the experience and its implications for future. The ‘What happened’ would then be a very small description referring to the experience and there would be rich and meaningful content in the ‘So What’ and ‘What next’ section. That would contribute to deep learning.

Various techniques and processes have been suggested by which medical educators can help develop the art of reflection in students (Cheung, 2018). What we need to keep in mind is that it will be a gradual learning process; students developing mastery with guided practice. Teachers will have an important role to play in shaping this by way of teaching, encouraging, discussing and modelling the art of reflection.

What shall we gain?

Logbook

If the system of maintaining a logbook based on the principles of formative assessment is followed diligently, it promises multiple advantages for all the stakeholders. These are summarised in Table 3.

Table 3: Advantages of maintaining a logbook based on the principles of formative assessment

Students
<ul style="list-style-type: none"> • More aware of their strengths and weaknesses • Motivated for new learning • Value the learning that is to be documented in the logbook • Feel confident and satisfied with the learning accomplished • Perform better in summative examinations • Learn regularly in a disciplined manner (instead of at the last minute) • Stress of summative exam will go down

Teachers
<ul style="list-style-type: none"> • Judge the competence of the students based on direct observation • Ensure attainment of competency, by guiding and shaping learning in real time • Identify gaps in the curriculum and improve the learning experience for the students (if many students are unable to perform a certain task well, for example)
Student-teacher relationship
<ul style="list-style-type: none"> • Shared and balanced responsibility of learning (students will neither be spoon-fed nor be left alone to learn by themselves) • Teachers perceived as mentors rather than assessors who just judge their learning • More opportunity for direct contact between teachers and students may break communication barriers and students may find teachers more approachable for taking help in their learning process.
College/Institute
<ul style="list-style-type: none"> • Logbook will serve as an assessment as well as a teaching tool (direct observation and real time feedback) • It will ensure that there is no stopping, and no going ahead, until the stated task is accomplished satisfactorily • Establish a minimum standard that is clear to both the teachers and the students • Help in creating a repository of activities required by the students to perform to attain the predefined competencies • Promote learning orientation rather than performance orientation (because of the feedback component)- students will open up and discuss what they want to learn rather than hide their deficiencies (Mangels et al, 2006) • Ensure that a culture of feedback develops and thrives; which is the single most important contributor to students' learning (Watling and Ginsberg, 2019 and Wright et al, 2019)
Society
<ul style="list-style-type: none"> • Ultimately, the Indian Medical Graduate (IMG) will be competent and more confident to practice in the society and the society will also place more trust in the system and the IMG

Portfolio

Maintaining a portfolio would have added advantages. Over and above all the benefits listed in Table 3, it would have a few unique advantages. By having the student reflect on the learning process, it would lead to the development of critical thinking, deep learning and self-directed learning (Challis, 1999). Also, it would provide an opportunity for creative self-expression via selection of material and its presentation.

Conclusion

Making the logbook mandatory as a part of the CBME curriculum for undergraduate medical students is a welcome step and holds a lot of promise. It is essential that students and teachers are sensitised to the purpose of the logbook and the role that they need to play for its successful implementation. Maintaining portfolios would be the desirable next step, for which it's important that the students learn and master the art of reflection. This would bring about a sea change in the learning experience and the final competence of the Indian medical graduate.

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