

IMPLEMENTING FORMATIVE ASSESSMENT: TEACHERS' PERCEPTIONS AND CHALLENGES IN MEDICAL COLLEGES OF PESHAWAR, PAKISTAN; A QUALITATIVE STUDY

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ABSTRACT

BACKGROUND: Formative assessments (FA) play an important role in medical education as they provide immediate feedback, assist students in recognizing deficiencies in their comprehension, and enhance their clinical competencies. Teacher awareness, motivation, resource accessibility, and continuous support are various aspects for the successful implementation of these initiatives.

OBJECTIVE: The objective of the study was to investigate the teachers' perceptions and challenges faced in the implementation of formative assessment at medical colleges in Peshawar, Pakistan.

METHODOLOGY: A qualitative study was applied by utilizing semi-structured interviews with a purposive sample of a total of twelve participants from medical colleges of Peshawar. Thematic analysis was employed to identify recurring themes of awareness, motivation, and the resources necessary for FA implementation.

RESULTS: Based on the teacher's perception, two major themes were identified: the challenges in implementing formative assessment, and the second is suggested solutions. The major challenges were time restrictions, which frequently hindered the regular and comprehensive assessments, while insufficient resources and inadequate training restricted their ability to deliver complete feedback. The absence of clear guidelines and acknowledgment for new techniques, along with restricted chances for feedback, further hindered the implementation of formative assessments. Resource allocation and staff training were the main recommendations.

CONCLUSION; The effective adoption of formative assessments necessitates not only awareness and motivation but also an effective support system. Institutions must confront issues such as time limitations, resource inadequacies, and insufficient training via focused professional development and pragmatic workshops. Equipping the teachers with assessment tools, protocols, and technology can mitigate resource constraints.

KEYWORDS: : Formative assessment, Teacher, Medical college, Assessment, Implementation, Challenges, Qualitative study, Professional development

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INTRODUCTION

Formative assessment (FA) is used during the learning process to provide feedback to students and teachers on how well the students are learning and what they need to do to improve.¹ FA may be formal or informal. Formal FA is designed to assess specific curriculum objectives or learning standards. It differs from summative assessment, which is used at the end of a learning period to evaluate student performance.²

In Pakistan, medical institutes place a strong emphasis on summative assessment. The incorporation of formative evaluation in the curriculum is not mandatory.³ Recently, the shift to integrating curricula in undergraduate medical education has been based on the notion that an active, learner-centered environment promotes a deeper understanding of basic science and its importance in clinical medicine.⁴ One of the biggest obstacles to implementing formative assessment in integrated curricula in medical colleges is the lack of resources.⁵

Teachers play a crucial role in the design and implementation of formative assessment.⁶ The successful implementation of formative assessment requires the support and participation of teachers. However, studies have shown that teachers rarely practice formative assessment in classrooms, and the actual adoption is far less than satisfactory.⁷

The implementation of formative assessment can pose various challenges, which have been addressed in the literature. Some studies concluded that the low effectiveness of formative assessment is due to a lack of teacher training in designing, implementing, and evaluating formative assessment.⁸ However, some studies have shown that due to limited time and resources, teachers often feel overburdened when implementing formative assessment properly, especially if they are also responsible for other tasks such as teaching and grading.⁹ The effectiveness of formative assessment is also influenced by the quality of feedback, which has been found to have a significant impact on student achievement. However, most medical colleges use

"formative assessment" as a passing component of their curricula, employing a variety of techniques that may or may not involve providing feedback to students.³ Another study concluded that the proposed change from a conventional to a new integrated curriculum requires robust planning and coordination amongst the various stakeholders in medical institutions.¹⁰

The first step in developing a plan to address the challenges is identifying them, which will improve the standard of medical education and students' performance in medical college¹¹. The existing literature highlights a gap in fully capturing and addressing the challenges faced by teachers in implementing formative assessment.¹² Therefore, there remains a need for further research to explore the complexities of teachers' experiences in greater depth. This work will address national education issues within the local cultural context.

METHODOLOGY:

This study employed an exploratory qualitative approach to gain deeper insights into the perspectives and experiences of medical teachers regarding the challenges they face in implementing formative assessments. The research was conducted across four medical colleges in Peshawar, Pakistan. Two private and two public sector medical schools have a faculty of 100-150 and no fewer than 100 medical students per year in each class. The medical schools are selected based on the following criteria: first, they are ranked among the largest in Peshawar in terms of the number of medical teachers; second, they have integrated curricula from both the public and private sectors. Semi-structured interviews were conducted with individual teachers to explore the challenges and suggested solutions related to formative assessment using a developed interview guide.¹² The interview guide is shown in 1.

Participants

Medical teachers were invited to participate because they are primarily involved in implementing formative assessment in classrooms. The purposive sampling technique was used to select the participants for this research.¹³ Twelve medical teachers were interviewed, with three from each of the four medical schools. Teachers from both basic and clinical sciences, with at least one year of teaching experience and a background in health professions education, were included. Those in administrative roles or unavailable during data collection were excluded.

Ethical approval was obtained from the relevant authorities, and the interview guide was shared with the participants. Written consent was obtained from all participants who voluntarily participated in the study. Confidentiality was maintained by ensuring anonymity. Data was collected through one-to-one semi-structured interviews.

Conceptual Framework:

The ADKAR model (Awareness, Desire, Knowledge, Ability, Reinforcement) serves as a framework for comprehending and

administering change on an individual basis.¹⁴ This model offers a systematic framework to examine teachers' awareness of formative assessment, their motivation for its adoption, their knowledge and capacity for implementation, and the reinforcement mechanisms that support its continued usage. The model was thoroughly explored, and 12 questions were developed to address each of its domains for use with the research participants. The initial set of questions was refined based on feedback from five experts with 15–20 years of experience in medical education. To ensure clarity and alignment with the study's objectives, the interview questions were finalized following two pilot interviews conducted to assess their accuracy and relevance.¹⁵

Data analysis

A thematic analysis of data was conducted using an inductive approach.¹⁶ Both written notes and audio recordings were transcribed and reviewed multiple times by the first and second authors to ensure a thorough understanding. Codes were assigned to key elements of the raw data for meaningful interpretation. The extensive list of codes was then organized and analyzed to identify relationships, allowing some codes to be combined into major themes or grouped into sub-themes. After a second cycle of coding, four sub-themes emerged. In the final step, the relevance of each sub-theme to the research question was assessed. Ultimately, the final report presented two main themes and five sub-themes.

Quality assurance

The trustworthiness of qualitative research is primarily determined by four key criteria: credibility, transferability, dependability, and confirmability.¹⁷ In this study, each of these aspects was carefully addressed. Peer debriefing was performed on the interpreted data to facilitate triangulation, and both the first and second authors independently evaluated the interview transcripts and audio recordings to ensure credibility. Participants received their interview transcripts, and analysis proceeded only once they validated and endorsed the content. Dependability was ensured through meticulous documentation of each phase of the study process. This was additionally corroborated by sequential replication and an external audit, during which three co-authors evaluated a sample of interviews. Comprehensive explanations of the study setting, interview materials, and direct quotations from participants enhanced the transferability. The application of purposive sampling in four medical colleges, along with the incorporation of participants with diverse subjective experiences, enhanced the contextual richness and transferability of the results.¹⁸ An audit trail was regularly maintained to ensure confirmability, encompassing documentation of coding judgments, data analysis procedures, and the formulation of coding frameworks.¹⁹ To maintain the quality and rigor of this exploratory research, the Consolidated Criteria for Reporting Qualitative Research (COREQ-32) checklist was adhered to, especially due to its emphasis on intricate

healthcare issues.²⁰ The potential impact of the study team's perspectives was investigated through reflective analysis by the first author, seeking transparency and authenticity in the research narrative. Participants were granted autonomy in choosing a suitable location for their interviews and maintained control over the procedure, particularly during phone interviews, to guarantee their comfort and sincerity.

perspectives through semi-structured interviews. Of these, five were male and seven were female, with half of them teaching in basic sciences (n=6) and half in clinical sciences (n=6). Employment status varied, with two professors, two associate professors, two assistant professors, and six lecturers. In terms of work experience, half of the participants (n=6) had 1-3 years of experience, three had 4-6 years, and three had 7-10 years. Two major themes, along with five sub-themes, emerged from our analysis (Table 1).

RESULTS

A total of twelve participants (n=12) were included in this study. Three teachers from each medical college shared their

Table 1: Major themes with subthemes and codes

Sr no	Major theme	Sub-theme	Codes
1	Challenges in implementing Formative assessment	Lack of understanding	Misunderstanding the purpose of Formative Assessment
			Confusion Between Formative and Summative Assessments
			Misinterpretation of Feedback
		Time management	Lack of staff commitment
			Workload and motivation
			Integration into Existing Workflows
			Time constraint
		Logistics and resources	Lack of resources
Large number of students			
2	Suggested solution	Resource allocation	Online Assessment Tools and technology support
			Time allocation
			Adopt a reasonable student-staff ratio
			Administration coordination
		Faculty development	Staff training

Table 2: Challenges in implementing formative assessment- representative quotations

Subtheme	Code	Representative Quotations
Lack of understanding	Misunderstanding the Purpose of FA	"Usually, teachers have a misconception that formative assessments are only useful for evaluating student performance" (Participant B)
	Confusion Between Formative and Summative Assessments	"Teachers often confuse formative assessments with summative ones, using them to rank students rather than to identify learning needs." (Participant E)
	Misinterpretation of Feedback	"Many teachers view feedback as a tool for grading rather than a means to guide learning and improvement." (Participant D)
Time management	Lack of staff commitment	"I have seen teachers who prefer sticking to traditional assessment methods, as they feel more comfortable and familiar with them, despite the potential benefits of formative assessments." (Participant J)
	Workload and motivation	"So, at times, the actual interest is lost because the teacher is exhausted, or for that matter, the students feel that they have reached the level of their cognitive overload" (Participant H)
	Integration into Existing Workflows	"Sometimes we face challenges in planning and integrating when and how often formative assessments should be conducted. Balancing the frequency of assessments with the flow of instructional time, while ensuring they are meaningful and aligned with learning objectives, is a complex process that requires thoughtful consideration and careful scheduling." (Participant A)
	Time constraint	"Usually, teachers who are overburdened with lectures and assessments don't focus on the formative assessment because of workload and timings" (Participant C)

Logistics and resources	Lack of resources	"We have limited resources for formative assessments like learning management systems for supporting integration and software tools like Kahoot, Socrative, etc. for assessment," (Participant F)
	Large number of students	"We have a large number of students in the class it is difficult to manage each student's participation" (Participant G)

Table 3: Suggested solutions- representative quotations

Subtheme	Code	Representative Quotations
Resource allocation	Online Assessment Tools and technology support	"The integration of online assessment tools into formative assessment practices enhances timely feedback and data-driven instructional decisions. However, successful implementation requires ongoing technical support for educators to ensure the seamless use of these digital platforms and the ability to customize them according to classroom needs. Teachers must be equipped not only with the tools but also with the expertise to maximize their potential in promoting student learning." (Participant K)
	Adopt a reasonable student-staff ratio	"After some time, we realized that a balanced ratio allows teachers to provide more individualized feedback, engage in deeper instructional interactions, and better monitor each student's progress, ultimately fostering a more effective learning environment" (Participant F)
	Administration coordination	"I think one suggestion would be to ensure support from school administration in coordinating and managing the logistics of formative assessments." (Participant L)

<p>Faculty development</p>	<p>Staff training</p>	<p>"Prioritize comprehensive staff training. Equipping teachers and supporting staff with the necessary skills and knowledge ensures they can effectively implement formative assessments and utilize available tools, leading to improved student outcomes." (Participant A)</p>
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Challenges in implementing Formative assessment:

The first theme was about the challenges teachers face when implementing formative assessments in medical schools.

Lack of understanding: Many participants expressed concerns about the challenges they face when implementing formative assessments, particularly due to a lack of knowledge on how to conduct and effectively integrate these assessments into their teaching practices. This limited understanding often leads to inconsistent application and reduces the potential benefits of formative assessments for student learning. As one participant expressed,

"I really struggle with knowing how to incorporate formative assessments into my lessons. I often feel like I'm just guessing what works best for my students." (Participant A)

Many teachers reported experiencing confusion between formative and summative assessments, which often resulted in ineffective implementation of assessment strategies. This misunderstanding can lead to practices that are misaligned and do not support the intended goals of enhancing student learning.

Time management: The insufficient staff commitment poses a major obstacle to the effective implementation of formative assessments, as stated by many participants. The excessive workloads and diminished motivation can impede teachers' readiness to participate in evaluation processes. Moreover, incorporating formative assessments into current workflows presents challenges, particularly due to the time constraints teachers face in their everyday activities.

"One participant mentioned, 'With everything on our plates, it's hard to find the motivation to commit to formative assessments. Sometimes, it feels like just another task to squeeze into an already packed schedule.'" (Participant B)

Logistics and resources: Participants generally stated that logistical challenges and insufficient resources considerably restrict the effective implementation of formative assessments. With the high student-to-teacher ratio in each classroom, the restricted access to tools and materials hinders educators from delivering the individualized feedback and assistance necessary for effective formative assessments.

"As one participant noted, 'I have so many students in one classroom, therefore it's always tough to manage formative assessments, especially with not enough resources. I often feel overwhelmed and unable to give each student the attention they need.'" (Participant E)

Suggested solution:

The strategies proposed by teachers for the effective use of formative assessments in medical schools are identified in the second theme. Participants have identified several critical areas for enhancement in the implementation of formative assessments.

Resource allocation: Many participants emphasized the importance of developing online assessment tools and providing technological support to enhance the assessment process. Moreover, for evaluations and the implementation of an acceptable student-to-staff ratio, essential criteria were emphasized, including the allocation of appropriate time. To oversee logistics, collaborating with school administration helps optimize the execution of formative assessments, benefiting teachers and students.

"One participant said, 'To my experience, better access to online tools and extra time for assessments could really improve our approach. This also needs cooperation from the administration department to make this process smoother.'" (Participant B)

Faculty development: Participants emphasized the importance of faculty development, particularly through extensive staff training. Equipping teachers with essential skills and knowledge enhances their confidence and enables them to improve student learning outcomes by implementing formative assessments effectively. Continuous professional development opportunities can foster a culture of ongoing improvement and innovation in assessment methodologies.

"One participant said, 'Training should be mandatory for faculty to enhance our setting, for example, workshops and assessment tools for efficiently utilizing formative assessment. Participant E

Study participants identified several problems, including inadequate understanding, limited resources, and excessive workloads, that substantially hinder the execution of formative assessments. They emphasized the need for enhanced staff training and administrative support to promote effective assessment methods. Participants proposed that incorporating online technologies and enhancing communication among teachers could improve the overall efficacy of formative assessments in their educational settings.

Zhang et al. in their study of 2021 carried out a retrospective analysis. Out of a population of 621 patients, only a minority of 139 patients (22.4%) had received antithrombotic treatment. Of these, 110 patients were treated with antiplatelets and 35 with

DISCUSSION

Formative assessment (FA) promotes deep learning by placing feedback at its core. However, its advantages can only be fully realized when it is implemented effectively, and the associated challenges are addressed. This study explored, through qualitative analysis, the obstacles medical teachers encounter in practicing FA. The findings highlighted gaps in both comprehension and execution, shedding light on key factors that hinder effective implementation, along with proposed solutions.

The weak commitment to FA observed among both medical teachers and students appears to stem from a limited understanding of its true purpose and nature. The current study's findings highlight that the effective implementation of formative assessments is significantly influenced by teachers' awareness and understanding of these tools. Teachers who are well-versed in the principles of formative assessments are more likely to integrate them effectively into their teaching practices. These findings are comparable to and parallel with one of the studies, which has shown that teachers' understanding of formative assessment is essential for its successful application and professional development aimed at enhancing their knowledge to improve instructional practices and student outcomes.¹² Similarly, findings from another study note that teachers often lack comprehensive training on formative assessment techniques, leading to inconsistent application and limited effectiveness.²¹

The study's findings reveal that teachers' desire to participate in formative assessment is crucial for its successful and sustainable adoption. Teachers are more likely to integrate new techniques when personally motivated and recognize their value, aligning with another study which highlights motivation as a key factor in adopting educational innovations.²² However, the integrative review suggests that personal motivation alone is insufficient without systemic support, emphasizing the need for leadership and colleague collaboration to sustain adoption, a contrast to participants' experiences in this study, where a lack of resources and administrative support hindered implementation.²³ Additionally, teachers noted that formative assessment increases their workload, as it requires continuous evaluation, feedback, and adjustment of teaching methods.²⁴

The study's findings align with broader research on teacher professional development and the adoption of formative assessment practices. One study identified the need for a clear understanding and practical examples, which participants in this study also highlighted as essential for effective implementation²⁵. Similarly, another study notes that professional development aligned with teachers' goals fosters the successful adoption of new practices.²⁶ Studies stress that training should be tailored, hands-on, and provide step-by-step guidance. Participants in this study echoed the need for practical workshops and ongoing support.²⁷ Moreover, the importance of mentorship and follow-up to sustain long-term success is a sentiment reinforced by the

teachers in this study.²⁸ Overall, comprehensive training and continuous support are crucial for confidently implementing formative assessments.²⁹

The study emphasizes equipping teachers with the necessary training, resources, and time to implement formative assessment (FA) effectively. Previous research highlights the need for comprehensive, relevant training that bridges theoretical knowledge with practical application, a sentiment echoed by participants in this study.^{30,31} Additionally, challenges such as low faculty/student ratios and logistical issues in medical schools, particularly in Pakistan, were noted, underscoring the need for better resource allocation and time for FA.³² E-assessment, leveraging technology and social media, was recommended to overcome time constraints.³³ Accrediting bodies should include FA in their requirements.³⁴ Teachers in this study also emphasized the importance of positive reinforcement and recognition, suggesting that acknowledgment, awards, and feedback boost morale and encourage innovative practices, a finding supported by prior research.^{35,36} Finally, fostering supportive environments for experimentation, collaboration, and professional development was a key motivator, as recognized in earlier studies.³⁷ This study offers valuable insights into the current state of formative assessment in the region; however, several limitations should be noted. The reliance on qualitative interview data introduces subjectivity, as teachers' perceptions may vary and be influenced by personal biases or recent experiences. The lack of longitudinal data limits understanding of how formative assessment practices evolve. Additionally, variability in how formative assessments is applied across classrooms may affect consistency, potentially limiting the generalizability of the findings. Lastly, the study focuses primarily on teachers' perceptions, with limited emphasis on student outcomes, which could provide a more comprehensive evaluation of the effectiveness of formative assessment.

CONCLUSION

Implementing FA is a challenging task; addressing these challenges is necessary to enhance the integration of FA into the medical college curriculum. The study concluded that medical teachers often lack adequate awareness, motivation, knowledge, resources, and reinforcement. Successful adoption requires comprehensive training, practical application, and ongoing support. To meet these needs, institutions should develop targeted professional development programs, provide clear guidelines and resources, ensure administrative support, and foster a culture of recognition and feedback.

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