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FROM BARRIERS TO ENABLERS: EXPLORING FACILITATORS OF CRITICAL THINKING IN UNDERGRADUATE MEDICAL EDUCATION

DE BARREIRAS A FACILITADORES: EXPLORANDO OS FACILITADORES DO PENSAMENTO CRÍTICO NA GRADUAÇÃO EM MEDICINA

DE BARRERAS A FACILITADORES: EXPLORACIÓN DE LOS CATALIZADORES DEL PENSAMIENTO CRÍTICO EN LA FORMACIÓN DE GRADO EN MEDICINA

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ABSTRACT: Critical thinking is essential in medical education, yet research has often emphasized its barriers rather than what enables it. This qualitative study examined facilitators of critical thinking among thirteen participants, including medical students and faculty at a large university. Data were gathered through semi-structured interviews and analyzed using conventional content analysis. Five key themes emerged: supportive learning environments, interactive teaching strategies, constructive feedback, encouragement of curiosity, and the influence of role modeling. Participants noted that respect and open dialogue created psychological safety; active methods such as problem-based learning and simulations promoted deeper reasoning; and feedback and mentorship fostered reflection and honesty. The study reframes critical thinking as a process shaped by cultural, pedagogical, and relational factors. It highlights the need for educational reforms that integrate these facilitators across the curriculum and recommends further research on adapting such conditions to diverse contexts.

KEYWORDS: Critical thinking. Medical education. Qualitative study. Learning environment. Problem-based learning.

RESUMO: *O pensamento crítico é essencial na educação médica, contudo, as pesquisas frequentemente enfatizam suas barreiras em vez de seus facilitadores. Este estudo qualitativo examinou os facilitadores do pensamento crítico entre treze participantes, incluindo estudantes de medicina e docentes de uma grande universidade. Os dados foram coletados por meio de entrevistas semiestruturadas e analisados utilizando análise de conteúdo convencional. Cinco temas principais emergiram: ambientes de aprendizagem acolhedores, estratégias de ensino interativas, feedback construtivo, incentivo à curiosidade e a influência de modelos de comportamento. Os participantes observaram que o respeito e o diálogo aberto criaram segurança psicológica; métodos ativos, como a aprendizagem baseada em problemas e simulações, promoveram um raciocínio mais profundo; e o feedback e a mentoria fomentaram a reflexão e a honestidade. O estudo reformula o pensamento crítico como um processo moldado por fatores culturais, pedagógicos e relacionais. Ele destaca a necessidade de reformas educacionais que integrem esses facilitadores em todo o currículo e recomenda mais pesquisas sobre a adaptação dessas condições a diversos contextos.*

PALAVRAS-CHAVE: *Pensamento crítico. Educação médica. Estudo qualitativo. Ambiente de aprendizagem. Aprendizagem baseada em problemas.*

RESUMEN: *El pensamiento crítico es esencial en la educación médica; sin embargo, la investigación suele enfatizar sus barreras en lugar de sus facilitadores. Este estudio cualitativo examinó los facilitadores del pensamiento crítico entre trece participantes, incluidos estudiantes de medicina y docentes de una gran universidad. Los datos se recopilaron mediante entrevistas semiestructuradas y se analizaron utilizando análisis de contenido convencional. Emergieron cinco temas principales: entornos de aprendizaje acogedores, estrategias de enseñanza interactivas, retroalimentación constructiva, fomento de la curiosidad y la influencia de modelos de comportamiento. Los participantes señalaron que el respeto y el diálogo abierto generaron seguridad psicológica; los métodos activos, como el aprendizaje basado en problemas y las simulaciones, promovieron un razonamiento más profundo; y la retroalimentación y la mentoría impulsaron la reflexión y la honestidad. El estudio reformula el pensamiento crítico como un proceso moldeado por factores culturales, pedagógicos y relacionales. Destaca la necesidad de reformas educativas que integren estos facilitadores en todo el currículo y recomienda más investigaciones sobre la adaptación de estas condiciones a diversos contextos.*

PALABRAS CLAVE: *Pensamiento crítico. Educación médica. Estudio cualitativo. Entorno de aprendizaje. Aprendizaje basado en problemas.*

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INTRODUCTION

Critical thinking has become one of the most important professional skills that learners must acquire. In this context, critical thinking is described as a higher-order cognitive ability that allows individuals to evaluate information, weigh alternatives, and make sound clinical judgments (Facione & Facione, 2006). Since healthcare requires decisions under pressure, nursing and medical scholars have long argued that cultivating these skills is essential to safe and effective practice (Simpson & Courtney, 2002). As a result, educators have positioned critical thinking not merely as a desirable trait but as a foundational competence that crosses disciplinary boundaries, from clinical reasoning to ethical decision-making (Hale, 2008).

By extending this argument further, research in medical schools has shown that teaching reasoning explicitly enhances diagnostic accuracy and reduces errors, reinforcing the idea that critical thinking is a clinical as well as educational priority (Windish, 2000). More recently, scholars have reiterated this importance by showing that critical thinking remains at the center of modern reforms in medical curricula worldwide, with comprehensive reviews confirming its value across diverse educational contexts (Châlon et al., 2024; Araújo et al., 2024). Finally, umbrella reviews of evidence synthesize this consensus by demonstrating that teaching methods which prioritize active engagement—particularly problem-based learning—consistently lead to stronger critical thinking and clinical decision-making outcomes (Ge et al., 2025).

Building on this recognition of importance, research has also made clear that medical curricula often struggle to create conditions where critical thinking can flourish. Despite broad acknowledgment of its relevance, studies have documented that students in many institutions still display weak performance in critical thinking assessments, reflecting curricular shortcomings (Amini & Fazlinejad, 2010). When educators evaluate outcomes, they repeatedly find that traditional approaches to teaching, dominated by lectures and memorization, fail to stimulate independent reasoning (Athari et al., 2011). Moreover, evidence suggests that faculty attitudes and teaching traditions act as persistent barriers, as instructors accustomed to information-transmission often undervalue or overlook opportunities for deeper inquiry (Agnes & Mary, 2005).

These limitations are not confined to a single context but appear across different stages of training, with some longitudinal work indicating that progression through medical school does not reliably strengthen critical thinking, pointing to structural deficiencies in the curriculum itself. Contemporary meta-analyses reinforce this critique by showing that innovative designs such as flipped classrooms or case-based learning systematically outperform standard lectures in cultivating both theoretical understanding and analytical ability (Shi, X et al., 2025; Shi, L et al. 2025). Systematic reviews also confirm that self-directed and student-centered

approaches encourage qualities linked to autonomy and reasoning, making them more compatible with the cultivation of critical thinking than traditional didactic models (Aulakh et al., 2025).

This pattern of findings reveals that while the need for critical thinking is widely recognized, most empirical literature has concentrated on describing the barriers that obstruct its development rather than the opportunities that might enable it. For example, earlier work has identified cultural resistance to change and institutional inertia as forces that limit the integration of critical thinking into classrooms (Rezaiee & Pourbairamian, 2016). In addition, studies show that stress, fatigue, and high workload undermine students' willingness and ability to engage in reflective questioning, illustrating the environmental and psychological pressures that act as constraints (Najafianzadeh et al., 2014; Sharifi et al., 2018). Other analyses point to curricular overcrowding, lack of time, and insufficiently prepared faculty as further barriers that reinforce a culture of rote memorization over independent reasoning (Alipour et al., 2013).

More recently, qualitative investigations confirm that faculty themselves often observe low student motivation and resistance to active learning, reinforcing the perception that barriers are deeply embedded in institutional practices (Batarfi & Agha, 2025). Narrative reviews echo this view by cataloging how curricular design, faculty development, and systemic pressures combine to inhibit innovation (Châlon & Lutaud, 2024). Extending beyond curriculum alone, recent studies of medical students' engagement with research also document time constraints and mentorship shortages as obstacles to developing the questioning mindset that underpins critical thinking (Quintero et al., 2025). These findings demonstrate that the literature has provided a rich description of what holds students back but has yet to systematically examine the opposite perspective: the facilitators that can actively nurture critical thinking within medical education.

Because this imbalance in literature leans heavily toward highlighting obstacles, the next step for medical education research is to consider the positive conditions that actually foster critical thinking. Theoretical perspectives in critical pedagogy remind us that education is not only about transmitting information but about empowering learners to question, critique, and construct meaning. Foundational thinkers such as Freire (1970) and Giroux (2011) have argued that critical inquiry emerges in spaces where students are positioned as active participants rather than passive recipients. Similarly, Kellner (2001) emphasizes that educational environments should cultivate agency and dialogue, both of which are essential for critical thinking to take root.

This view is supported by empirical work showing that representation, questioning, and dialogic teaching encourage students to engage with complexity rather than reproduce information (Cosgrove, 2011; DeWaelsche, 2015). In cultural contexts where rote learning is

common, scholars have also demonstrated that strategies for promoting questioning can be adapted and still prove effective, confirming that critical thinking can be facilitated across diverse traditions (Tan, 2017). Recent systematic reviews further expand this argument by cataloging concrete pedagogical practices—such as collaborative discussions, inquiry-based learning, and problem-based approaches—that consistently enhance critical thinking in medical students (Araújo et al., 2024; Ge et al., 2025).

In addition, research on facilitation in health professions education highlights the role of small-group learning environments, where facilitators actively guide dialogue, ask probing questions, and model reflective practice (Burgess et al., 2020). Likewise, studies of role modeling underscore how students observe and emulate the reasoning and questioning habits of their instructors, reinforcing that facilitation is not only structural but relational (Patel et al., 2023; Koh et al., 2023). Finally, evidence on feedback practices reveals that constructive, timely responses from faculty function as catalysts for deeper reflection, further situating facilitators as critical levers for cultivating student critical thinking (Dewi et al., 2023).

Because these perspectives and findings together highlight the need to move beyond identifying barriers, the present study was designed to explore facilitators of critical thinking in medical education through qualitative inquiry. Although meta-analyses confirm that methods such as problem-based learning, flipped classrooms, and concept mapping improve student performance on critical thinking measures (Su et al., 2025; Ge et al., 2025; Fonseca et al., 2023), these reviews also point to gaps in understanding how such outcomes are achieved in practice. Scholars argue that while strategies can be listed and tested quantitatively, the contextual conditions—such as faculty approaches, classroom climate, and mentoring practices—that enable critical thinking require qualitative examination (Azar et al., 2024).

Earlier work suggested that curriculum design choices and institutional priorities play important roles in fostering critical thinking (Talebzadeh et al., 2009; Nabeiei et al., 2016), yet systematic evidence from the perspectives of both students and faculty remains limited. Because existing meta-analyses and theoretical discussions highlight the “what” of critical thinking facilitation but not the “how” or “why,” this study seeks to fill that gap by exploring the facilitators of critical thinking in undergraduate medical education. By focusing on conditions that support rather than hinder, the study aims to provide insights that can guide curriculum development and educational practice in ways that directly cultivate this essential competency.

METHOD

Since the goal of this study was to explore how critical thinking is actively supported in medical education, a qualitative approach was selected to capture the depth and subtlety of participants' experiences. By drawing on open-ended narratives rather than fixed responses, the design created space for participants to explain not only what happened in their learning but also how and why particular conditions encouraged critical thinking. This flexibility made qualitative inquiry the most appropriate way to uncover the lived realities of students and faculty.

The research was conducted in a medical university that provides both preclinical and clinical training. The institution offered a setting where critical thinking was expected to play a role across different stages of the curriculum, making it a rich site for exploration. To ensure a variety of perspectives, the study included thirteen participants: seven undergraduate medical students from years one through six and six faculty members drawn from basic science and clinical departments. Bringing together these two groups allowed the study to compare how facilitators of critical thinking were described by learners on one side and by educators on the other.

To give participants the opportunity to speak in their own voices, data were gathered through semi-structured, in-depth interviews. These interviews lasted between thirty and fifty minutes and were conducted either face-to-face or through secure online platforms, depending on convenience. Questions invited participants to recall specific learning or teaching situations where critical thinking had been encouraged, while follow-up prompts helped to elicit greater detail. By conducting interviews in whichever language participants preferred and transcribing them verbatim, the researchers aimed to preserve both nuance and authenticity in the accounts.

Once the transcripts were complete, analysis proceeded through a process of conventional content analysis designed to bring structure to the narratives. The research team first immersed themselves in the data by reading transcripts several times, then began coding meaning units connected to facilitators of critical thinking. Codes were gradually condensed into categories, and categories were refined into themes that captured broader patterns across participants.

To strengthen the credibility of these interpretations, the study incorporated several strategies for trustworthiness. Summaries of early themes were returned to five participants, who confirmed that the analysis reflected their experiences. Two independent qualitative researchers reviewed portions of the coding process to challenge and refine interpretations, adding an external perspective. The inclusion of both students and faculty also functioned as a form of triangulation, ensuring that insights did not represent a single group only. Reflexive

discussions within the team provided an additional check, helping to identify assumptions and keep the analysis grounded in the data.

Finally, because ethical integrity was central to the conduct of the study, approval was obtained from the university's institutional ethics committee before data collection began. All participants gave written informed consent and were assured that their identities would remain confidential. Pseudonyms were used in all transcripts and reports, and any potentially identifying details were removed. Participants were also reminded of their right to withdraw from the study at any stage without penalty, ensuring that their involvement was entirely voluntary.

RESULTS

Participants shared detailed accounts of the moments and conditions that made them feel more capable of questioning, analyzing, and reflecting. Across both students and faculty, a clear picture emerged that critical thinking is not sparked by isolated activities but by a constellation of experiences where the learning environment, teaching approach, and interpersonal relationships intersect. The analysis revealed five themes that described these facilitators of critical thinking: a supportive learning environment, interactive teaching strategies, constructive feedback, curiosity and questioning, and the influence of role modeling and mentorship. Together, these themes wove a narrative of how medical education can move beyond rote memorization to nurture deeper intellectual engagement.

The first theme, a supportive learning environment, was described as the foundation on which all other facilitators rested. Students repeatedly emphasized that they were more willing to challenge ideas when they felt respected and safe from judgment. One student explained, "*In some classes I sit quietly, but when the professor says, 'your perspective matters,' I start speaking up, and that is when I realize I'm thinking more critically.*" Faculty supported this sentiment, noting that students' willingness to participate depended on the atmosphere created in the classroom. A clinical instructor recalled, "*When I tell students disagreement is welcome, the discussion changes completely, and suddenly their reasoning becomes sharper.*" These reflections show that the psychological climate—whether it conveyed openness or fear—directly shaped the extent to which students dared to engage critically.

The second theme, interactive teaching strategies, highlighted how methods such as problem-based learning, simulations, and case discussions compelled students to go beyond memorization. Learners described how these activities demanded connections and choices rather than simple recall. A fourth-year student explained, "*During case discussions I cannot just repeat what I've read; I have to decide which details matter and why, and that pushes me*

to think on another level." Faculty reinforced this perspective, with one basic science professor noting, "*When I bring clinical scenarios into class, the students start asking questions I did not expect, and often their reasoning surprises me*." Several students also described how simulations added a sense of urgency that sharpened their thinking, with one remarking, "*It feels like a real ward, and even though it's stressful, I learn how to prioritize, and that makes my thinking clearer*." These accounts illustrate that active teaching does not only convey knowledge but creates situations where reasoning becomes unavoidable.

The third theme, constructive and timely feedback, emerged as a catalyst that turned moments of learning into opportunities for reflection. Students valued feedback that asked them to revisit their thought process rather than merely confirming correctness. One fifth-year student recounted, "*After I presented a case, the professor didn't just say if I was right; he asked why I had chosen that approach, and his questions made me rethink my reasoning*." Faculty saw this as central to their teaching role, with one clinician explaining, "*Good feedback is not about giving the answer—it is about making the student pause and evaluate their own logic.*" Several students stressed that feedback which acknowledged effort, even when they were wrong, motivated them to continue engaging critically. As one student put it, "*I got the diagnosis wrong, but the professor told me my reasoning was strong and that encouraged me to keep questioning*." These reflections suggest that feedback, when timely and dialogic, not only corrects errors but builds habits of self-examination.

The fourth theme, encouragement of curiosity and questioning, revealed how a culture of inquiry was deliberately fostered by faculty who welcomed questions rather than dismissing them. Students described curiosity as a driving force for their learning, noting how it was amplified when teachers encouraged them to ask "why" and "what if." One second-year student recalled, "*Our physiology professor always says, 'If you don't ask why, you haven't really learned,' and that sentence pushes me to think differently*." Faculty also recognized the importance of protecting curiosity, with one stating, "*Even a naive question can open up the deepest reflection, so I never shut it down*." Students highlighted that when they were encouraged to pursue connections beyond the syllabus, their learning felt more authentic. A fifth-year student explained, "*I linked something from pathology to a patient I saw during volunteering, and my teacher encouraged me to explore it, which turned into a small project*." Together these narratives show that curiosity is not only an internal trait, but a behavior strengthened or stifled by faculty responses.

The fifth theme, role modeling and mentorship, demonstrated that students often learned critical thinking by observing and imitating how faculty themselves reasoned through problems. Several students recounted that seeing their instructors wrestle with uncertainty was a powerful lesson. A sixth-year student reflected, "*I learn more when my supervisor explains*

how she reasons through a difficult case than from any textbook, because I can see how she handles doubt." Faculty intentionally modeled this openness, with one noting, "*I share my uncertainties and walk students through my thinking, so they see critical thinking as a process, not a gift*." Students emphasized the lasting influence of mentors who showed intellectual honesty, with one remarking, "*My mentor always told me, 'Don't memorize my answer—follow my thinking,' and that completely changed how I approach problems*." Informal mentorship outside the classroom was also described as significant, especially when faculty encouraged students to articulate reasoning during ward rounds. These accounts reveal that role modeling is not confined to formal teaching but extends to everyday interactions where students witness how professionals confront complexity.

Taken together, these five themes tell a coherent story of how critical thinking is facilitated in medical education. Rather than emerging from abstract curriculum documents, facilitators were rooted in real practices: safe and supportive environments, active methods that demand reasoning, feedback that stimulates reflection, curiosity nurtured through openness, and mentors who model critical habits of mind. In combining these elements, participants described critical thinking not as a rare skill but as a natural outcome when conditions are deliberately shaped to encourage it.

DISCUSSION

As this study sets out to explore how critical thinking is nurtured rather than hindered, the findings offer a valuable complement to the existing body of research that has traditionally emphasized barriers. Participants highlighted five interrelated facilitators—supportive environments, interactive strategies, constructive feedback, curiosity, and role modeling—that together created conditions for deeper intellectual engagement. While much of the literature has catalogued obstacles such as rigid curricula, faculty resistance, or student passivity (Châlon et al., 2024; Batarfi & Agha, 2025), this study turns the lens toward the enabling conditions that make critical thinking not only possible but natural in everyday learning. By shifting attention in this way, the results underscore the importance of moving beyond problem identification to designing educational practices that deliberately cultivate higher-order thinking.

Since this study found that students were more willing to engage critically when they felt respected and supported, it becomes clear that the learning environment functions as the foundation for critical thinking. Participants described how a climate of openness encouraged them to challenge ideas without fear of being dismissed. This finding resonates with earlier research showing that psychological safety directly shapes students' willingness to speak and reason aloud (Rezaei & Haqqani, 2015; Najafianzadeh et al., 2014). What our findings add,

however, is a closer look at the small interpersonal gestures—such as an instructor validating a tentative answer or explicitly welcoming disagreement—that transformed silence into dialogue. The theoretical insights of Freire (1970) and Giroux (2011) help explain why these gestures matter: when classrooms shift from hierarchical delivery to dialogic exchange, students begin to see themselves not as passive recipients but as active contributors. Similarly, Kellner (2001) emphasized that respect and agency are essential for cultivating critical inquiry, and the present study illustrates how these principles take shape in concrete medical classroom interactions. In this sense, the environment is not simply a backdrop for learning but an active driver of whether students dare to think critically.

Building on the importance of atmosphere, the findings also showed that teaching methods themselves acted as catalysts for deeper reasoning. Students emphasized that problem-based learning, simulations, and case discussions forced them to move beyond memorization and grapple with uncertainty. This aligns with recent systematic reviews confirming that interactive strategies consistently outperform traditional lectures in developing critical thinking (Shi, L et al., 2025; Aulakh et al., 2025; Ge et al., 2025). Yet our contribution lies in showing why these methods succeed: participants described them as contexts where passivity was impossible, since they had to weigh evidence, defend choices, and negotiate meaning with peers. These reflections parallel what Spaic et al. (2025) observed in their review of flipped classrooms, where students used class time for active reasoning rather than passive notetaking. Similarly, Mengesha et al. (2024) documented measurable gains from flipped approaches, as our study adds the lived perspective of students who experienced these gains as moments of being "pushed to think on another level." The critique offered by Reddi and Javidi (2025) that many curricula remain lecture-heavy is illustrated here in students' comparisons between passive sessions and active ones. These connections suggest that interactive teaching is not simply a novel technique but a structural condition that compels the kind of reasoning participants identified as central to critical thinking.

As these active methods demanded reasoning in the moment, participants also pointed out that what often consolidated their learning was the way feedback was delivered. Students emphasized that feedback mattered most when it went beyond confirming right or wrong answers and instead asked them to revisit their thought processes. This observation aligned with the argument by Dewi et al. (2023) that students value feedback not only for correction but for how it shapes their reflective habits. In our findings, learners described feedback as transformative when it became a dialogue, such as when a professor asked, "Why did you choose this approach?" rather than simply pointing out an error. This aligns with Nicola-Richmond et al. (2024), who showed that students perceive feedback as most powerful when it enhances their evaluative judgment. What our data adds is the lived experience of students

who reported that feedback which acknowledged their reasoning—even when flawed—encouraged them to persist in questioning rather than retreat in silence. Maqsood et al. (2025) provide further support for this pattern, demonstrating that feedback integrated with reflection leads to deeper and more sustained learning. In this way, the present study extends existing research by showing that the effect of feedback is not mechanical but relational: it becomes a catalyst for critical thinking when it communicates respect for the learner's reasoning process.

If feedback initiated the process of reflection, then curiosity and questioning sustained it. Participants described how their own sense of curiosity often determined whether they engaged critically, but they also stressed that curiosity did not thrive in isolation, it was cultivated or stifled by faculty responses. This finding resonates with the work of Cosgrove (2011), who emphasized questioning as the engine of critical thinking, and is supported by more recent studies showing that curiosity is an overlooked yet essential factor in medical learning (Bugaj et al., 2023). In our study, students recalled professors who explicitly encouraged them to ask "why" or "what if," and they linked these invitations to a stronger sense of ownership in their learning. This mirrors Shrivastava (2024), who argued that curiosity connects theoretical knowledge with clinical reasoning, making learning more meaningful.

At the same time, participants noted that even a dismissive remark could shut down inquiry—a finding that aligned with Grijpma et al. (2024), who showed that effective facilitators actively scaffold questions to maintain engagement. By situating these insights alongside Freire (1970) notion of dialogue, our study reinforces the idea that curiosity is not only an internal disposition but a relational act, cultivated in the exchanges between student and teacher. Thus, curiosity becomes less about individual personality and more about the culture of inquiry that instructors choose to foster.

If curiosity set the stage for inquiry, then role modeling and mentorship provided living examples that showed students how critical thinking unfolds in practice. Participants described how they learned not only from what their instructors taught but from how they reasoned aloud, weighed uncertainties, and admitted doubt. A sixth-year student, for example, reflected that watching a supervisor "think through a difficult case" was more instructive than memorizing any textbook answer. This aligns with Patel et al. (2023), who highlighted that modern learners see role modeling as essential to shaping both their decision-making and professional attitudes.

Our findings extend this by showing that students perceive honesty about uncertainty as itself a form of teaching. This resonates with Koh & Koh (2023), whose systematic review demonstrated that role modeling supports not only professional identity formation but also the development of cognitive habits. Sutcliffe et al. (2025) add further weight by showing how

students actively construct role models from everyday clinical encounters. In linking these perspectives, our study suggests that mentorship is not an incidental influence but a deliberate facilitator of critical thinking, enacted when faculty share their reasoning processes openly and invite students into that space of inquiry.

As these themes converge, the educational implications become difficult to ignore. The findings suggest that critical thinking cannot be reduced to curriculum documents or abstract competencies but must be cultivated through environments, pedagogies, and relationships that consistently encourage it. This resonates with Talebzadeh et al. (2009) and Nabeiei et al. (2016), who emphasized that curriculum design choices strongly shape whether students develop higher-order thinking. Yet the present study highlights that design alone is insufficient without the relational practices—such as supportive climates, active facilitation, dialogic feedback, and mentorship—that bring those designs to life. Kitto et al. (2025) reinforce this by showing that institutional cultures and faculty development communities play a central role in sustaining such practices.

Likewise, Hammond (2023) demonstrates that facilitation styles significantly influence how students engage with case-based learning, underscoring that strategy effectiveness depends on how educators enact them. By weaving together these insights, our findings point toward a more holistic view of educational reform: one in which curriculum content, faculty preparation, and classroom culture work together to create conditions where critical thinking can thrive.

By reframing the discussion toward facilitators rather than barriers, this study contributes to literature in a way that responds to ongoing calls for a deeper understanding of how critical thinking is enabled. While recent meta-analyses confirm the effectiveness of strategies such as problem-based learning, flipped classrooms, and concept mapping (Fonseca et al., 2024; Ge et al., 2025), scholars have noted that these reviews often stop short of explaining the contextual mechanisms that make these strategies successful (Azar et al., 2024). The present study helps fill that gap by capturing the lived experiences of students and faculty who described how facilitation, mentorship, and feedback created the “why” behind the “what.”

Blalock et al. (2025) emphasize that qualitative inquiry remains essential for uncovering such mechanisms, as it allows researchers to access perspectives that are often invisible in quantitative synthesis. Similarly, Gundler and Allison (2024) have shown that innovations in teaching often bring both opportunities and challenges for educators, suggesting that understanding these tensions requires research attentive to context. By contributing narrative evidence to this conversation, our study positions facilitators not as abstract constructs but as tangible practices that can be cultivated deliberately in medical education.

Even as these contributions expand the conversation, it is important to acknowledge the study's limitations and point toward future directions. Conducted within a single institution with a relatively small group of participants, the findings cannot be generalized in a statistical sense. Instead, their value lies in the depth of insight they provide into how facilitators of critical thinking are experienced in one context. Future research could extend this work by adopting multi-institutional or cross-cultural designs to explore how different settings influence the presence of facilitators.

Mixed-methods studies might also triangulate qualitative accounts with quantitative measures of critical thinking outcomes, thereby strengthening the evidence base. Carlton et al. (2017) meta-analysis reminds us that the field still lacks large-scale, comparative evidence of how interventions translate into consistent gains. Similarly, Barzegar et al. (2023) highlight the importance of exploring educational practices in varied clinical settings, pointing to outpatient contexts as under-researched arenas. By building on these directions, future work can help translate the kinds of facilitators identified here into broader strategies for reform that are both evidence-based and adaptable across settings.

CONCLUSION

The findings of this study suggest that critical thinking is not an abstract competency to be checked off in medical curricula, but a lived practice shaped by environment, pedagogy, and relationships. Students and faculty alike described how respect, dialogue, active learning, feedback, curiosity, and mentorship converged to create moments where critical engagement felt natural rather than forced. This reinforces the idea that critical thinking is not a static skill but a dynamic process, one that depends on conditions deliberately cultivated by educators. By reframing attention toward facilitators, the study highlights that educational culture is as important as educational content.

Beyond this, the study also points toward a more integrated model of medical education, where critical thinking is not confined to specific courses or assessments but embedded throughout the learning continuum. When feedback invites reasoning, when curiosity is encouraged, and when mentors model intellectual honesty, critical thinking becomes woven into the everyday habits of learners. This challenges institutions to rethink how they define success: not only in terms of exam scores or procedural competence, but in fostering reflective practitioners who can navigate uncertainty. Drawing from the literature on higher-order learning and professional identity, the implication is that cultivating critical thinking may also strengthen resilience and adaptability—qualities that are increasingly vital in healthcare systems under pressure.

Finally, the study underscores a forward-looking agenda for educators and researchers alike. Future reforms must move beyond importing generic teaching strategies and instead consider how facilitators can be tailored to local cultural and institutional contexts. The diversity of examples shared by students and faculty demonstrates that facilitators are not one-size--fits-all but emerge from the interplay of people, practices, and values within a given setting. For researchers, this means designing studies that not only measure outcomes but also trace processes, capturing how critical thinking develops in real time.

For educators, it means committing to classrooms and clinical spaces where students are not only taught to know, but invited to think, question, and reason. In this sense, the conclusion of this study is also a beginning: a call to reimagine medical education as a continuous process of creating the conditions in which critical thinking can thrive.

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