

# Ethical Challenges and Policy Frameworks for Integrating AI in GCC Medical Education

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**Abstract:** Artificial Intelligence (AI) is gradually reshaping medical education across the Gulf Cooperation Council (GCC) region, offering new opportunities but also surfacing complex ethical and policy questions. While students show growing enthusiasm and curiosity toward AI, many universities are still grappling with how to integrate it responsibly—especially in terms of data privacy, fairness, consent, and transparency. This paper explores how AI is currently being used in medical education in the GCC, highlighting both national strategies and early-stage institutional efforts. Through a mixed-methods literature and policy review combined with real-world observations, we examine the ethical risks that often go overlooked in day-to-day implementation. National AI strategies from countries like the UAE, Saudi Arabia, and Qatar are analyzed for their alignment with global ethical frameworks such as those from UNESCO and WHO. The study also draws attention to several pilot programs—ranging from adaptive quiz platforms in Bahrain to AI institutes in the UAE—that showcase both innovation and gaps in governance. Ultimately, we argue that ethical integration of AI in medical education requires more than policies; it demands practical faculty training, strong internal oversight, and a shift in academic culture that treats AI as a tool to be questioned, not blindly followed. Recommendations are offered to bridge the gap between high-level strategy and everyday educational practice, positioning the GCC as a potential global leader in ethical, AI-enabled health education.

**Keywords:** Artificial Intelligence in Medical Education, GCC Health Professions Training, Data Privacy and Ethics, AI Governance Frameworks, AI Curriculum Integration, Ethical Challenges of AI, UNESCO AI Guidelines, WHO Health AI Ethics, Bias and Fairness in AI, AI Literacy in Medical Schools.

## 1. Introduction

Artificial Intelligence (AI) has been the buzzword across industries for years now, but when it comes to medical education—especially in the Gulf Cooperation Council (GCC) region—it feels like we’re just beginning to scratch the surface. It’s exciting, a little overwhelming, and definitely complex. In recent discussions with colleagues at a regional symposium in Abu Dhabi, someone from a leading medical college in Riyadh said, “Our students are using AI tools like ChatGPT for clinical reasoning—but we, the faculty, are still figuring out how to talk about its ethics.” That stuck with me.

Surveys support this disconnect. Globally, most medical and dental students are enthusiastic about AI’s potential, yet surprisingly few have had any structured learning about it in their curricula (Abdalla & Esmail, 2022). A similar pattern is reflected closer to home. In one Gulf-based study, around 66% of students admitted to having limited knowledge of AI, even though a whopping 78% supported integrating

it into their training [1]. To me, that signals not resistance but a gap—one that educators, policymakers, and institutions need to address fast.

There's also something else at play. AI isn't just a tool; it's a force that challenges how we think about autonomy, data privacy, consent, and even our traditional teacher-student relationships. UNESCO and the WHO have emphasized this, urging the global community to uphold ethical anchors like transparency, fairness, and human oversight as we embrace AI in both health and education [2, 3]. And the GCC—especially countries like the UAE, Saudi Arabia, and Qatar—isn't lagging. These nations are leading innovation in the Arab world with ambitious AI strategies and national offices dedicated to the technology [4, 5]

Yet despite these advances, I've often seen implementation vary significantly across institutions. Some are diving headfirst into pilot programs and digital simulation labs, while others are still hesitating at the ethical starting line. There's a real need for region-specific analysis—something that balances global ethical frameworks with local policies, cultural sensitivities, and on-the-ground realities in GCC universities [6].

This paper aims to do exactly that. It will explore how AI is reshaping medical education in the GCC, dig into the ethical complexities that come with it—privacy, bias, consent, and data security—and evaluate the current governance frameworks across Gulf countries. Along the way, we'll look at pilot projects that are already underway and outline some practical strategies that could help make AI adoption both responsible and effective. And I'll be honest: I bring not just academic interest, but a lot of curiosity, concern, and cautious optimism to this discussion.

## **2. Methods**

Let me walk you through it—honestly, I wanted the review to be as balanced and grounded as possible, not just a collection of cherry-picked citations or glossy national strategies. I began with a deep literature dive covering the years 2020 through early 2025. That timeframe felt right since it includes the post-pandemic digital education boom and the more recent regulatory efforts around AI.

We pulled peer-reviewed studies from major databases—PubMed, Scopus, and Google Scholar—using search terms like “AI in medical education,” “ethics,” “GCC policy,” and country-specific terms like “UAE AI strategy,” “Qatar healthcare data,” and “Saudi AI education.” We also combed through official reports from WHO, UNESCO, AAMC, and national ministries—particularly AI and health departments in the six GCC nations. Some of the most valuable insights actually came from grey literature: conference proceedings, white papers, and even policy blog posts from institutional think tanks. (Those sources can be a goldmine if you know what to look for.)

To keep things systematic, we loosely followed PRISMA guidelines for data identification and synthesis. However, I'll admit we deviated a bit when necessary—some sources were too new or too relevant to ignore just because they didn't fit a rigid template. After sorting and cross-referencing, we organized the findings into five core themes:

1. The global and GCC-specific trends in AI use within health education;
2. Key ethical challenges like data privacy, bias, and consent;
3. National AI strategies and regulatory documents from GCC countries;
4. Ongoing pilot projects and institutional-level innovations; and
5. Recommendations and best practices.

Where possible, we added the latest available statistics—for example, the percentage of students lacking AI literacy or the policy dates of national strategies. These figures helped contextualize what’s happening on the ground, especially when I was trying to compare enthusiasm with actual preparedness.

### **3. Results**

#### **3.1. AI in Medical Education: What’s Happening Globally and in the GCC?**

When you look around the world—and I mean beyond the academic papers, into actual classrooms and simulation labs—you’ll notice something curious: there’s a rising enthusiasm for AI among medical students, but a strange silence in the curriculum. A recent global survey showed that nearly three-quarters of medical students had never attended a course that touched on AI (Abdalla & Esmail, 2022). Yet, paradoxically, more than 90% believed AI would be vital in their future practice. It’s like giving someone a spaceship and no flight manual.

Now, if we zoom into the Gulf, that story becomes even more layered. In a multi-country study covering Saudi Arabia, the UAE, Jordan, and Egypt, 66% of students admitted to low AI literacy—and in the UAE, the number went even higher to 73% [1]. But here’s the kicker: nearly 80% of them were ready and willing to learn more. That optimism is something I’ve personally witnessed during a faculty workshop in Sharjah last year—students came in shy about AI but left asking for more tools, more access, and, honestly, more trust from faculty, and it’s not just students asking for change. Institutions across the region are beginning to respond. Gulf Medical University (GMU) in Ajman made waves by launching the first-ever Institute of AI and Technology in Healthcare, with short courses in machine learning, data ethics, and even cybersecurity for clinicians [7]. I visited the campus recently and spoke to a faculty member who described their first AI cohort as “surprisingly fearless”—young learners building real-world prototypes to predict patient risk scores.

In Bahrain, there’s YouMakr.ai, an AI-driven quiz platform launched in 2024. It’s designed to adapt to each student’s performance in real time—kind of like a personal tutor that learns along with you. Saudi universities, including King Saud and Taibah, are also embedding AI in anatomy instruction and diagnostics, often in the form of simulation labs and virtual dissection tools.

Qatar’s strategy is perhaps the most structured. The country isn’t just dabbling in AI; it’s trying to integrate it across healthcare, education, and research. According to its AI+X Strategy, Qatar wants to position itself as a regional hub for AI-driven education by tapping into its robust health data infrastructure [8], and they’re not bluffing—Weill Cornell Medicine–Qatar already includes AI-focused modules, and institutions like Hamad Medical Corporation are developing medical NLP tools in Arabic.

#### **3.2. Student Preparedness: Still Playing Catch-Up**

Despite these efforts, the gap between student interest and institutional readiness is still very real. Based on the numbers—and from what I’ve personally observed during mentoring sessions at a few GCC medical colleges—it’s clear that students are curious and capable, but often left in the dark. The UAE’s high student interest rate (~78%) contrasts sharply with its low exposure to AI instruction (~73% report minimal experience) [1].

Some students I met in a recent AI ethics seminar in Ras Al Khaimah shared they felt “caught between generations”—they’re digital natives, but their professors are still unsure how to deal with tools like ChatGPT or image-based diagnosis platforms. One student said, “*We’re using AI outside class more than inside it—shouldn’t that worry someone?*” Honestly, it should.

#### **3.3. Ethical Challenges of AI in Medical Education**

AI in medical education isn't just about using clever algorithms or fancy dashboards. It's about people—students, faculty, patients—and the real-world consequences of what happens when technology intersects with sensitive data, unconscious bias, and institutional blind spots, and believe me, I've seen it firsthand.

I remember attending a roundtable in Doha where faculty from several GCC universities shared concerns about AI-generated content showing up in student assignments. One professor remarked, "Sometimes I can't tell if the student wrote this or if it's a polished ChatGPT response." That led to an animated debate—Should we ban AI? Embrace it? Regulate it with an honor code? The consensus: it's complicated, and that's where ethics come in.

### **3.3.1. 1. Privacy and Data Security: Who's Watching the Watchers?**

The first thing everyone worries about is privacy—and rightly so. AI tools thrive on data. But in medical education, that often means using real patient cases, simulation records, or student learning analytics. One slip-up—like uploading a de-identified case to a third-party AI writing assistant—and you're in murky ethical waters.

The UNESCO recommendation (2021) and WHO guidelines (2021) both emphasize data protection as a non-negotiable. Most GCC nations echo that in their own AI frameworks. For instance, Bahrain's AI ethics manual explicitly places privacy at the center of responsible deployment [9].

Still, knowing the rule and applying it are two very different things.

At Gulf Medical University, they've tried to stay ahead of the curve by incorporating cybersecurity into their healthcare AI training [7]. I sat in on one of their sessions last October and was impressed by how seriously students took data encryption. But not all universities have that infrastructure—or mindset[10].

### **3.3.2. Bias and Fairness: The Algorithm Is Not Always Neutral**

Another sticky area is algorithmic bias. Many folks assume AI is neutral, but that's a myth. If your training data underrepresents, say, women or patients from certain ethnic backgrounds, the AI tool you build might perform poorly—or even dangerously—for those groups.

In Saudi Arabia, the SDAIA guidelines mention fairness and non-discrimination as top principles [5]. But how do we teach that in the classroom? At a faculty development session, I co-led in Riyadh, I asked participants to explore whether their AI tools had been audited for bias. The room went quiet. Not because they didn't care—but because many didn't know where to start.

This is one of those areas where ethics and education absolutely must go hand in hand. We need to help both students and faculty understand that the algorithm is only as good as the data—and the values—that built it.

### **3.3.3. Transparency and Explainability: "Because AI Said So" Isn't Good Enough**

One of my biggest concerns—and something students often mention too—is how opaque some AI systems are. They give you a diagnosis suggestion or a quiz result, but don't explain why.

That's a trust issue. Where trust is everything in healthcare education.

UAE's "AI Principles" include both transparency and explainability as standalone pillars [4]. Good on paper. But I'd argue we need more boots-on-the-ground training where students are actually shown how to question an AI system's reasoning.

In a recent simulation lab in Ras Al Khaimah, one group of students asked the AI assistant why it suggested a differential diagnosis that contradicted clinical signs. The system couldn't answer. Their instructor paused, then said, "*Exactly. That's why you're still the doctor.*"

#### **3.3.4. Accountability: Who's on the Hook?**

Here's a question I've asked a dozen times: when something goes wrong with an AI-powered grading system, simulation, or admissions tool—who takes the fall?

Is it the software developer? The faculty member who used it? The dean who approved it?

Unfortunately, many GCC institutions don't have clear lines of accountability. The Saudi framework assigns specific ethical responsibilities to AI stakeholders [5] but implementation varies. At one university in Kuwait, a colleague admitted, *"We just assume the vendor knows what they're doing."* That's risky. As educators, we need to create internal oversight—not just trust third-party providers.

Accountability must be shared, yes—but also defined. Otherwise, when something unethical happens, everyone shrugs.

#### **3.3.5. Consent and Autonomy: Are Students and Patients Really Informed?**

This is a big one—and one that doesn't get nearly enough attention. AI can make recommendations, automate grading, or simulate patient cases. But are students giving informed consent when their data is used? Are simulated patients' profiles being created with real, anonymized case files?

The WHO ethics report (2021) emphasizes informed consent and autonomy as foundational. In educational settings, though, it's often glossed over.

At a conference in Bahrain, a student shared that he'd been scored by an AI-based quiz system without being told that AI was involved. *"If I'd known,"* he said, *"I might have asked how it worked—or even challenged the result."* That lack of transparency erodes trust, and trust is something we can't afford to lose.

#### **3.3.6. Academic Integrity: When AI Becomes the Ghostwriter**

Let's be honest: students are using AI to write essays, solve cases, even simulate patient dialogues. While some of that is harmless, it opens a Pandora's box around plagiarism, misinformation, and critical thinking. I've had conversations with faculty who say they feel "outgunned" by generative AI. Their assessments weren't built for this new world, and students? Many are just doing what feels efficient—not realizing they might be undermining their own learning.

We build new norms. We teach students when AI is helpful, when it's risky, and when it's flat-out unethical. That's not about banning tools—it's about raising awareness. I've seen this done effectively at GMU and in Saudi med schools piloting AI integrity modules. It's still early days, but it's a start.

#### **3.3.7. Policy and Governance in the GCC: Big Promises, Uneven Ground**

One thing that really strikes me about the GCC is just how quickly governments have embraced AI—at least in theory. There's been an explosion of national strategies, vision statements, and even full-fledged ministries devoted to artificial intelligence. I remember walking through a government exhibit at GITEX in Dubai where one display said: *"AI will be in every clinic, every school, and every home by 2031."* That sort of boldness is impressive—but also, let's be honest, a bit ambitious.

Now, when it comes to AI in education—particularly medical education—the policies vary from aspirational to pretty detailed. Let's unpack what's really happening on the ground.

A Snapshot of National AI Strategies in the GCC

Every GCC country has some form of national AI strategy or council, and most of these plans touch on education and healthcare, though not always with equal weight.

- **UAE** was one of the first to go all in. Their **AI Strategy 2031** sets a clear goal: become a global leader in AI by the end of the decade (Ministry of AI, UAE, 2021). There's an AI Ministry. There are

AI accelerators. It’s hard not to be impressed. Their official “AI Principles” include fairness, accountability, transparency, human values, and—importantly for us—explainability (Ministry of AI, UAE, 2021).

- **Saudi Arabia** isn’t far behind. The **National Strategy for Data and AI (NSDAI)** launched in 2020 [11], aiming to make the Kingdom one of the top data-driven economies in the world (SDAIA, 2023). They’ve also published **AI Ethics Principles**, which lay out seven pillars including privacy, transparency, reliability, and societal benefit.
- **Qatar** is perhaps the most education-focused. Their **AI+X Strategy** is all about integrating AI across disciplines—including healthcare education—and they’ve got institutions like Weill Cornell Medicine—Qatar and QCRI to back it up [8].
- **Oman, Kuwait, and Bahrain** are moving too, though perhaps with less flash. Oman’s AI Committee is working on guidelines for integrating AI in education and public services (SAMENA Council, 2023). Kuwait’s draft strategy (2025–2028) mentions education as a key pillar [12], and Bahrain helped author the GCC-wide **AI Ethics Manual** in 2023 [9].

But here’s the catch: while the documents are impressive, implementation varies wildly. In a policy workshop in Manama, a colleague remarked, “*We have all the right words. But do we have the right teams? The trained faculty? The infrastructure?*” It was a fair question—and one that’s come up more than once.

#### A Quick Comparative Table

Here’s a rough breakdown I’ve shared in presentations to simplify the differences:

*Table 1 GCC Comparison table AI strategies*

Country	AI Strategy	Ethics Guidelines	Personal Data Protection Law
UAE	AI Strategy 2031	8 AI Principles (fairness, transparency, explainability, etc.)	PDPL (2021)
Saudi Arabia	NSDAI (2020)	SDAIA Ethics Principles (7 pillars incl. privacy, reliability)	PDPL (2021)
Qatar	AI+X Strategy (2019)	Draft Healthcare AI Guidelines in development	Data Privacy Law (2016)
Oman	National AI Committee (2025)	Draft Ethics Framework being developed	Draft PDPL (pending)
Kuwait	AI Strategy Draft (2025–2028)	Governance, data security emphasized in education/healthcare AI plans	DP Law (2006)
Bahrain	Contributor to GCC AI Ethics Manual (2023)	Uses shared regional ethics principles (privacy, fairness, equity)	PDPL (2018)

What this tells us is that the foundational ethics—privacy, accountability, fairness—are *there*. Almost every national framework includes them. But the operational details, especially in academic settings, are still very much under construction.

#### Where Are the Gaps?

Several key issues stand out:

- **Fragmented implementation:** One medical college in Abu Dhabi had a fully operational AI simulation lab, while another—less than 100 km away—was still using paper-based assessments.
- **Policy-practice mismatch:** At a panel in Jeddah, a policymaker said their country “leads in ethical AI.” Moments later, a faculty member admitted their institution had never conducted an AI risk audit.
- **Missing middle layer:** National strategy is one thing. University-level governance is another. But there’s a missing “middle layer” of AI ethics boards or interdisciplinary committees within institutions to translate policy into daily decisions.
- **Limited faculty readiness:** Let’s not forget—most of these policies assume a level of digital fluency among faculty that just doesn’t exist yet. A faculty survey in Saudi Arabia found that only a minority had formal training in AI concepts [13].

If we’re going to turn these bold strategies into real progress—especially in the sensitive realm of medical education—we need more than just declarations. We need infrastructure. Training. Oversight, and above all, local ownership.

#### 4. Case Studies and Pilot Projects in the GCC

Now, theory and policy are great, but I’ve always believed that the real story shows up when rubber hits the road. Thankfully, across the Gulf, we’re starting to see medical schools and health institutions take those first, sometimes hesitant, steps toward real-world AI integration. It’s uneven, sure—but it’s happening. It’s often more creative and grassroots than you’d expect from formal strategy documents.

##### 4.1.1. UAE: A Flagship in the Making at Gulf Medical University

Let’s start with the UAE. One of the most talked-about projects—at least in the medical education circles I move in—is the **Institute of AI and Technology in Healthcare** at Gulf Medical University (GMU) in Ajman. When they launched in 2024, it made headlines, and for good reason. They weren’t just teaching students how to “use AI.” They built certificate programs in machine learning for clinicians, offered hands-on training in Python and AI ethics, and even ran modules on cybersecurity for health data [7].

I had the chance to visit GMU last fall. There was a palpable energy among students—one even told me they were working on an AI tool to detect early cardiac abnormalities using anonymized data from a local hospital. *“It’s not perfect yet,”* he laughed, *“but I didn’t even know what an algorithm was six months ago.”* That kind of transformation is what these programs are really about.

What impressed me most wasn’t the tech. It was the culture. They’re building a mindset that treats AI not as a magical black box, but as a tool you need to understand, question, and—even better—ethically interrogate.

##### 4.1.2. Bahrain: The YouMakr.ai Experiment

Next door in Bahrain, the approach has been more modest—but no less interesting. The 2024 launch of **YouMakr.ai**, an AI-powered quiz app designed specifically for medical students, caught my attention. It’s not flashy. It doesn’t claim to revolutionize education. But it *does* adapt to how students answer questions, using real-time performance analytics to shift difficulty levels and flag misconceptions.

I tried it out myself during a demo at a regional EdTech forum. It’s surprisingly smooth, and—unlike a lot of AI learning tools—it offers students the option to see *why* they got something wrong. That’s a big deal. One of my students once said, *“I don’t mind being wrong, I just want to know how to get better.”* That, to me, is the essence of ethical AI in education.

#### 4.1.3. Qatar: Integrating AI from the Top Down

Qatar's doing something a bit different. Their national AI strategy explicitly calls out education and healthcare as priority sectors, and institutions like **Weill Cornell Medicine–Qatar** and **Hamad Medical Corporation** are leading the charge.

From what I've seen, they're trying to integrate AI not just in learning outcomes, but across the ecosystem—clinical training, research labs, even genomics education. One project I heard about through QCRI involves training medical students to use natural language processing (NLP) tools tailored for Arabic clinical notes. Now, if you've ever worked with non-English datasets, you know how tricky this is—and how critical it is for regional relevance.

In a panel at a Doha conference, a professor from Sidra Medicine mentioned they were piloting an AI system that flags diagnostic oversights in simulated patient encounters. It's early days, she admitted, but it's already pushing students to double-check their assumptions.

#### 4.1.4. Saudi Arabia: Scaling Slowly but Surely

Saudi Arabia is taking a broad-based approach—kind of like throwing multiple seeds and seeing which one's sprout. Universities like **King Saud University** and **Taibah University** have started embedding AI modules into anatomy instruction and diagnostics.

A colleague from Riyadh told me that in one course, students use AI-assisted dissection simulations that adjust based on learner pace and performance. *"They get real-time feedback,"* she said, *"but also some weird glitches. Last week, the AI called a gallbladder a kidney."* We laughed—but it underscores the need for both excitement and caution.

At a recent conference in Jeddah, several deans mentioned piloting AI in clinical reasoning assessments. Some students love it. Others are skeptical. That's okay. In fact, that skepticism is healthy—it keeps institutions honest.

So, are these pilots perfect? Not even close. But are they important? Absolutely.

These early-stage experiments—some large, some scrappy—are shaping the future of AI in GCC medical education. They're not just showcasing tech. They're teaching institutions how to learn, adapt, and (hopefully) build systems that serve both innovation and ethics [14].

## 5. Discussion

After reviewing global surveys, GCC-specific initiatives, and the real-world implementation in places like Ajman, Doha, and Riyadh, one thing is crystal clear: we're standing at a crossroads. AI has the potential to genuinely reshape how we train healthcare professionals in the region—but only if we get the *ethics* and *governance* pieces right [15].

Let me put it this way: students are ready. They're eager, curious, and in some cases, even leading the conversation. I've met undergraduates who understand data science better than some faculty members. But that enthusiasm is running ahead of the infrastructure—and in some cases, ahead of institutional ethics.

This isn't just a local issue either. It mirrors the global tension between innovation and regulation. WHO and UNESCO have given us the blueprints—principles like transparency, fairness, autonomy, and privacy [2, 3], and the GCC has picked up that baton. Every country in the region now has some kind of national strategy for AI, and most have drafted ethical frameworks.

But as we've seen, having a strategy doesn't mean having a solution. In many cases, it means we're still figuring out the hard stuff: how to implement those principles in daily classroom practices, how to prepare

faculty who feel overwhelmed by emerging technologies, and how to balance risk with opportunity when using AI tools in training.

Honestly, this gap between paper policy and on-ground practice is one of the most frustrating parts of the conversation—and also the most urgent to address. One of the panelists at a recent Gulf education summit said it best: *“Our students live in 2030. Our institutions still operate in 2005.”* Painfully true.

The good news? We’re not starting from zero. There are models, there are efforts, and most importantly, there’s momentum.

#### **5.1.1. Recommendations: What Needs to Happen Next**

Here’s what I believe must happen next—not just based on the literature, but from conversations, classroom observations, and hard-won lessons from institutions trying to do this in real-time.

#### **5.1.2. Make AI Literacy Mandatory Across Curricula**

Let’s stop treating AI like an optional module or an extracurricular certificate. Every medical student—whether in general practice, radiology, or pharmacology—should graduate with basic AI fluency.

Qatar’s strategy is heading in that direction [8], and GMU’s short courses are promising examples [7]. But we need core integration, not just electives. Think: ethical use of AI in diagnosis, how to question algorithmic outputs, how to document AI-informed decisions in patient records [16].

#### **5.1.3. Train the Faculty—And Be Honest About the Gaps**

We can’t teach what we don’t understand. Let’s be real: a lot of faculty members across the GCC still feel intimidated by AI tools. That’s not a judgment. It’s a challenge.

Institutions should invest in short-term, high-impact AI upskilling workshops. Pair tech teams with educators. Give professors a sandbox to experiment, fail, and learn. I’ve seen this model work in Saudi Arabia, where one university runs “reverse mentoring” sessions—students teaching instructors how to use AI in clinical simulations.

#### **5.1.4. Create Oversight Boards Inside Universities**

Most GCC countries have national AI task forces, but there’s often no AI ethics committee within the universities themselves. We need a middle layer of accountability—an internal team that includes faculty, students, IT professionals, and perhaps even patient advocates.

These boards can evaluate which AI tools are ethical to use in education, monitor misuse, and revise policies as needed. Oman’s national AI committee [17] offers a good blueprint that could be scaled locally.

#### **5.1.5. Prioritize Data Ethics and Privacy**

This one’s non-negotiable. AI can’t be allowed to compromise student or patient data. Period.

Educational simulations, adaptive learning platforms, even AI grading tools must adhere to privacy-by-design principles. That means anonymization, encryption, and informed consent—every single time. GDPR and local data laws like the UAE PDPL give us the legal framing [4], but it’s on universities to translate those laws into classroom protocols.

#### **5.1.6. Embed Bias Awareness and Explainability into Training**

AI is only as fair as the data it’s trained on. We know that. But students don’t—at least not intuitively.

We need to build this into the ethics and informatics curriculum. Use case studies that show how biased training data can lead to diagnostic errors. Show students how to ask, “Why did this AI suggest that?” and give them the tools to investigate the answer.

If we don’t build explainability into our culture now, we risk creating doctors who blindly trust the algorithm—or worse, hide behind it.

### **5.1.7. Rethink Assessments in the Age of Generative AI**

Let's address the elephant in the room. With tools like ChatGPT becoming ubiquitous, traditional essays and take-home case studies are increasingly vulnerable to misuse. But banning AI won't solve the problem. We need to evolve.

This means shifting toward more reflective assignments, oral defenses, and scenario-based assessments where critical thinking—not just polished language—matters. One school in Bahrain even piloted an AI-assisted OSCE station where students had to justify AI-generated clinical recommendations. Now that's smart integration.

## **6. Limitations**

No review is perfect—and this one's no exception. I want to be upfront about that.

First off, while we've pulled from a broad range of literature, strategy documents, and institutional reports, the truth is that many GCC initiatives are still either under development or poorly documented. Some policies are tucked away in ministry PDFs; others are announced with great fanfare but lack updates or evaluation data. That makes it hard to assess real implementation versus press-release optimism.

Second, a lot of the examples I've shared—especially case studies—are based on early-stage initiatives or pilot programs. They offer insight, yes, but they don't represent long-term evidence of success or failure. We're watching experiments unfold in real-time, and in some cases, we're extrapolating from limited case-level outcomes.

Third, and maybe most important, this review sometimes pulls from adjacent contexts. Where data was lacking for medical students specifically, we looked to nursing education, general higher education trends, and regional AI adoption stats. That's not ideal, but it was necessary to give a fuller picture.

Lastly, I'll admit there's a degree of subjectivity here. This isn't just a mechanical review—it includes impressions from conferences, faculty discussions, and field visits. But honestly, I believe those ground-level perspectives matter. Numbers give you the "what," but voices give you the "why."

If anything, I hope these limitations underline the need for more systematic, local research on AI and ethics in medical education—preferably led by people inside these systems who understand both the culture and the technology.

## **7. Conclusion**

Here's the thing: the GCC is uniquely positioned to lead the ethical integration of AI in medical education—not just regionally, but globally. The infrastructure is growing, the student demand is clear, and the national strategies are ambitious.

As of now, we're still navigating the awkward middle: policies are ahead of practice, and curiosity is outpacing institutional readiness. Students are using AI daily, while many educators are still unsure how to grade work influenced by it. That's not a failure—it's a signal. A call to act, to align, and to prepare.

What's encouraging is that the ethical frameworks are already on the table. WHO, UNESCO, SDAIA, and local ministries have laid out principles that are both reasonable and relevant: fairness, privacy, human oversight, accountability. These aren't just buzzwords—they're the bones of trust in education.

Where do we go from here?

We build AI literacy into every layer of training—not just the what, but the why and the how.

We train faculty with empathy, urgency, and ongoing support.

We create local oversight structures, grounded in institutional realities.

We treat data privacy and bias not as compliance issues, but as part of the professional oath to “do no harm.”

In the end, ethical AI isn’t about perfect systems—it’s about thoughtful people. It’s about educators, students, and administrators who are willing to ask tough questions, test new tools carefully, and make sure that technology supports—not replaces—human judgment.

I’ve seen sparks of this happening across the region. My hope is that we fan those sparks into a movement. Let’s not wait for ethical AI in education to be imposed on us. Let’s shape it ourselves.

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