

Conversational AI as a Virtual Examiner: *Transforming Oral Board Preparation and Clinical Reasoning*

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OBJECTIVE

To evaluate an interactive, voice-based AI educational platform designed to simulate oral board-style examinations and deliver AMA PRA Category 1 Credit™—eligible continuing medical education across multiple medical specialties.

As generative AI rapidly integrates into health professions education, recent evidence highlights both its promise and its limitations. A 2026 scoping review of 23 studies found that AI tools can save faculty time in resource creation and assessment, yet the evidence base remains largely limited to small, short-term feasibility pilots lacking durable learning or clinical outcome data ([Generative AI for Teaching and Assessment in HPE, PubMed 2026](#)). Concurrently, the OECD Digital Education Outlook 2026 identifies adaptive tutoring, formative feedback, and faculty workload reduction as the three highest-yield AI applications in education — while cautioning that AI can raise assignment scores while undermining deeper conceptual understanding if pedagogy is not intentionally redesigned ([OECD/Pursuit, 2026](#)). Emerging policy frameworks increasingly position AI literacy, bias mitigation, and human oversight as non-negotiable requirements for responsible adoption ([Council of Deans of Health, 2026](#)).

This platform addresses these converging signals by embedding active retrieval practice and expert-modeled clinical reasoning within a conversational AI framework — prioritizing pedagogical alignment over passive content delivery. The system aims to enhance clinician preparedness through realistic clinical scenarios, democratize access to high-quality board preparation regardless of institutional resources, and provide a scalable, ACCME-aligned model for AI-enhanced active learning that meets emerging governance and equity standards in medical education.

DESCRIPTION OF THE TECHNOLOGY AND METHOD OF ITS USE

Platform Architecture

The application is a cloud-native, AI-powered adaptive education platform built on Microsoft Azure PaaS services, deployed within an academic medical center's Azure AI Foundry environment. It uses a multi-agent orchestration architecture comprising multiple independent AI engines:

- Simulation Engine** — clinical case generation via retrieval-augmented generation (RAG) with citation-backed evidence grounding
- Evaluation Engine** — competency assessment across diagnostic thinking, management planning, team communication, and technical decision-making, grounded in Item Response Theory and Bayesian Knowledge Tracing
- Guideline-Checker Engine** — real-time validation of AI outputs against curated clinical guidelines before delivery to the learner
- Adaptation Engine** — dynamic difficulty calibration using a two-parameter logistic IRT model, targeting 60–70% success during acquisition, 70–80% during consolidation, and 80–90% during maintenance
- Credit Management Engine** — ACCME-compliant CME tracking, session logging, and credit-hour calculation

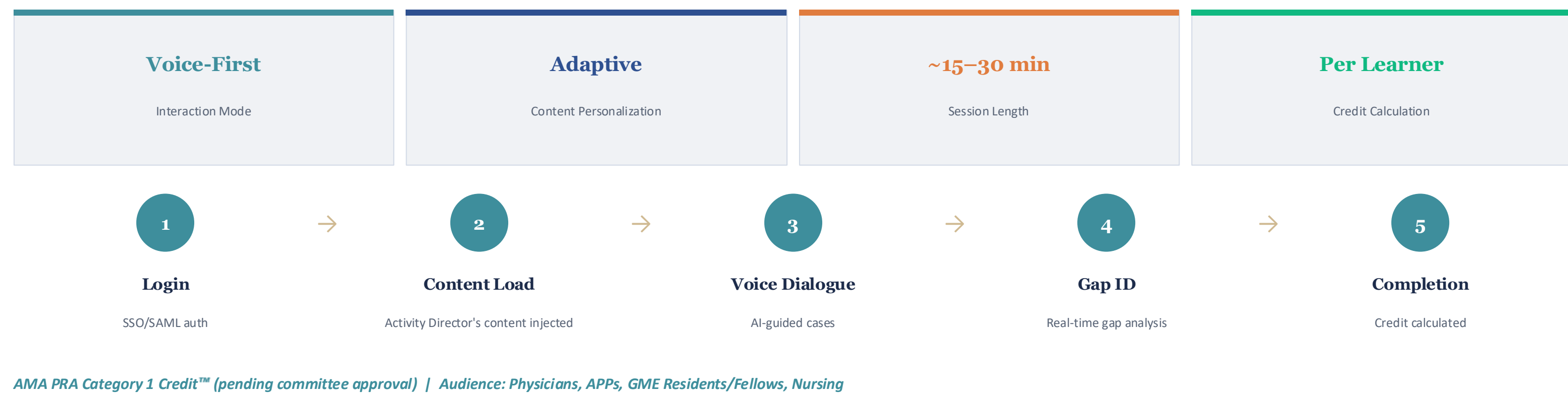
Learners authenticate via SSO and engage in voice-first clinical dialogue through WebRTC with sub-second latency, simulating examiner–examinee dynamics across OSCE, MCQ, and true/false formats. A strict three-role governance model ensures educational independence:

- Activity Director** — sole authority over all clinical content, learning objectives, and ground truths
- Platform** — delivery infrastructure only; no access to or influence over educational material
- Institutional CME Office** — accreditation oversight, disclosure validation, and final credit approval

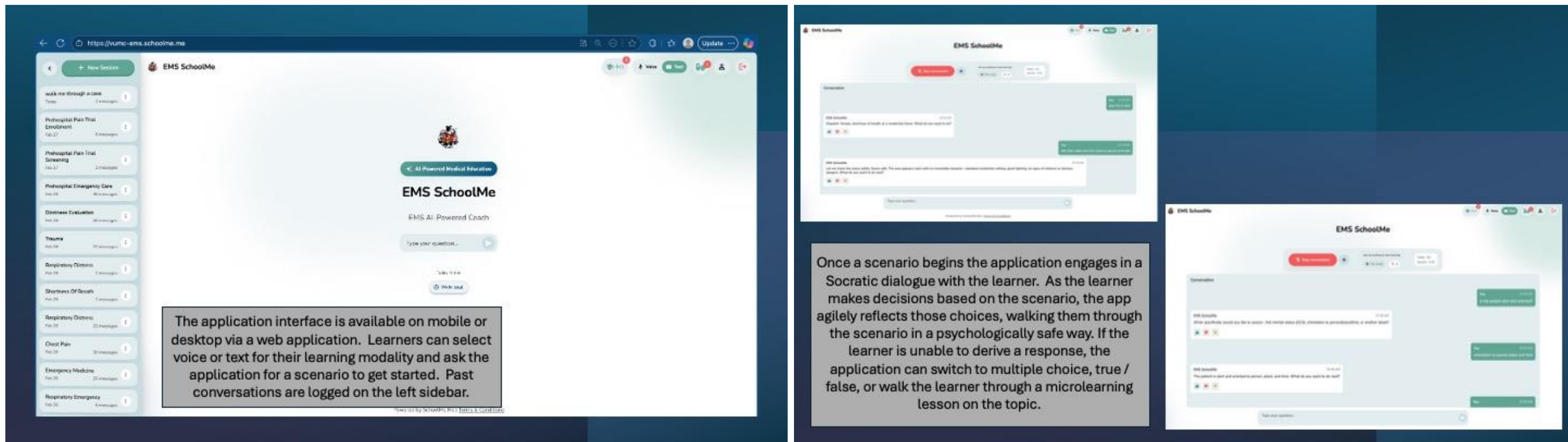
Key Differentiators

- Voice-first interaction: Natural conversational interface mimics real examiner-examinee dynamics
- Multi-specialty coverage: Adaptable across gastroenterology, surgery, critical care, emergency medicine, and more
- Real-time adaptation: Scenarios evolve based on learner responses (OSCE, MCQ, TF formats)
- Content firewall: SchoolMe staff cannot access, view, edit, or influence educational content

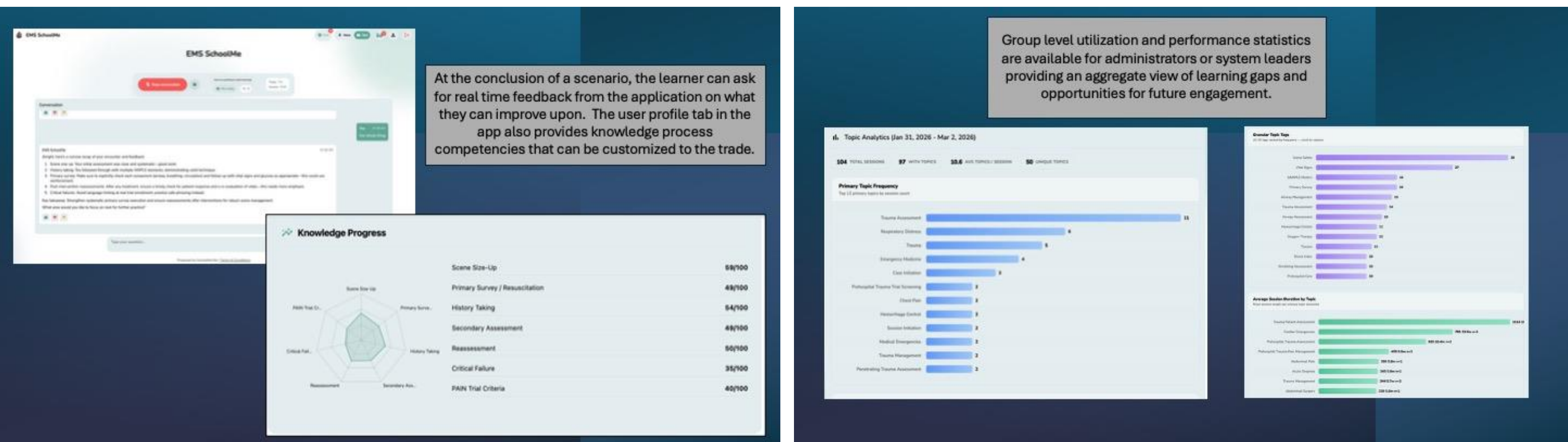
LEARNER JOURNEY & CME CREDIT



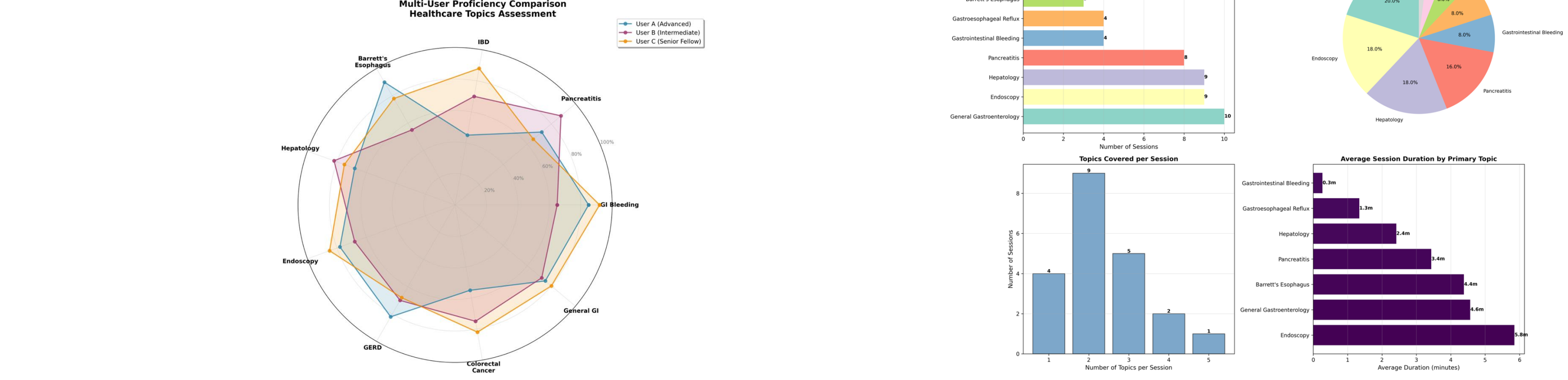
Screenshots



Reporting

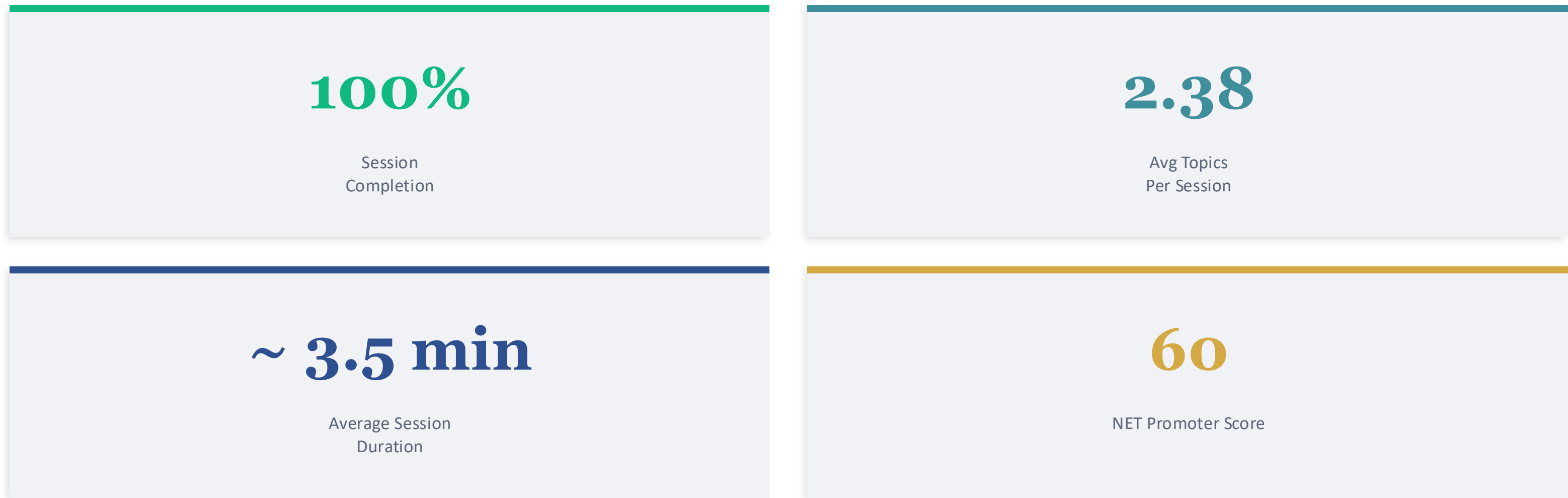


PRELIMINARY RESULTS



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Initial user testing (n=20 sessions) demonstrated:



- High engagement with sustained interaction across clinical topics
- Multi-topic coverage demonstrates platform versatility
- Efficient session length suggests focused, productive interactions

CONCLUSIONS & FUTURE DIRECTIONS

This platform demonstrates a novel approach to AI-enhanced medical education by generating clinical scenarios de novo in real time rather than retrieving from a static question bank. Each case is constructed adaptively during the learner interaction — the Simulation Engine synthesizes clinical content, evidence-based guidelines, and the learner's demonstrated competency profile to produce unique, context-sensitive encounters that evolve with every conversational turn. No two sessions are identical, even when covering the same clinical domain.

The platform offers learners flexibility in how they engage with material:

- Oral board-style vignettes** — open-ended, voice-driven clinical dialogue simulating examiner–examinee dynamics
- Multiple-choice questions** — structured assessment with adaptive difficulty calibration
- True/false formats** — rapid-fire knowledge checks targeting specific competency gaps
- Hybrid sessions** — format shifts dynamically within a single session based on learner performance and preference

This format-agnostic design, combined with real-time case generation, positions the platform to scale across specialties, training levels, and institutional contexts without the bottleneck of manual case authoring. Future directions include integration of clinical image interpretation (radiographs, CT, ultrasound), expansion of longitudinal competency tracking with ACGME milestone alignment, and multi-institutional validation studies linking AI-driven active learning to durable clinical reasoning and patient outcomes, addressing the evidence gaps identified in the current literature ([Generative AI for Teaching and Assessment in HPE, PubMed 2026](#); [AI in Medical Education, JMIR 2026](#)).

Future Directions

- Comparative effectiveness studies vs. traditional board preparation methods
- Integration of multimodal inputs (clinical imaging, laboratory data, monitoring waveforms)
- Longitudinal competency tracking with ACGME milestone alignment
- Multi-institutional validation studies
- Formal CME pilot launch with AMA PRA Category 1 Credit™ designation and MOC credit expansion

INTERACTIVE DEMOS



EMS Student Training
Pre-hospital care scenario
with voice-based clinical reasoning
Designed for novice learners



Hemothorax Management
Critical care decision-making
with real-time AI feedback