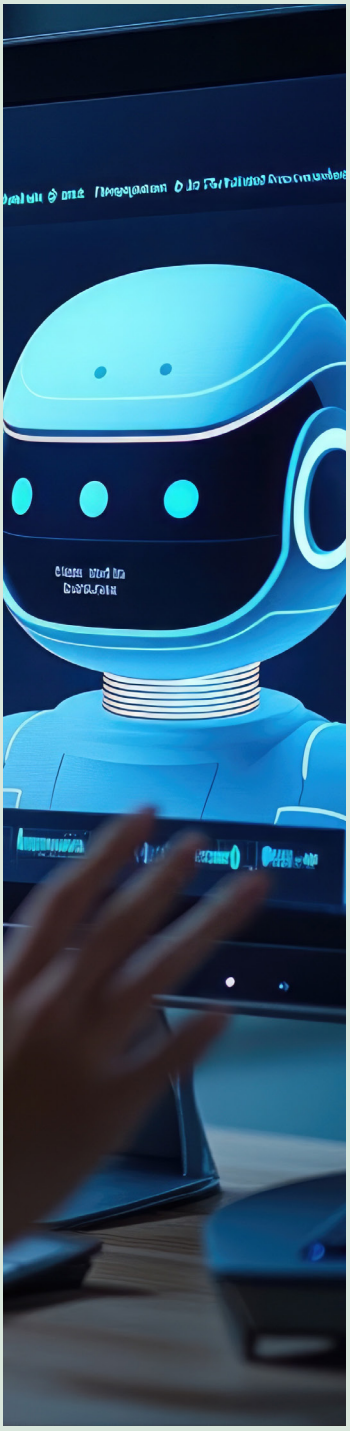
WHITE PAPER



AI IN EDTECH: REWIRING LEARNING OUTCOMES

Abstract

This POV presents a forward-looking perspective on the transformative role of Artificial Intelligence (AI) in education, drawing on global research and Infosys' domain expertise. As AI reshapes learning from standardized instruction to personalized, data-driven experiences, education leaders face both unprecedented opportunities and complex risks. The paper synthesizes insights from leading organizations such as OECD, UNESCO, and the World Bank, highlighting the need for responsible implementation, robust governance, and evidence-based measurement to ensure equitable and sustainable impact.

Infosys' AI-First GCC enabled a large K–12 curriculum provider to rapidly scale innovation, safely operationalize AI through sandboxes and multilingual model tuning, and convert pilots into measurable, compliant, and equitable learning gains across 21 product lines.

Ultimately, this POV advocates for an AI-first, human-centered approach—pairing teacher capacity, equity commitments, and disciplined measurement with responsible technology—to deliver lasting improvements in teaching, learning, and operational outcomes across diverse educational contexts.

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Introduction

Artificial Intelligence (AI) is reshaping education globally, moving from one-size-fits-all instruction to personalized, feedback-rich, and data-driven learning. Global reports from OECD, UNESCO, and World Bank highlight both opportunities and risks, emphasizing the need for responsible implementation and workflow redesign to realize enterprise-level value.

Global Trends and Market Outlook

How AI Adoption Is Shaping Learning Outcomes Across the Globe

Over the past several years, artificial intelligence has moved from the periphery of education to its very center, **reshaping how students learn, how educators teach, and how institutions operate.** What began as a collection of isolated experiments and small pilots has now evolved into a global movement, with countries, school systems, universities, and EdTech companies embracing AI as a catalyst for measurable learning gains.

The **global outlook on AI in education** reflects both momentum and maturity. According to Microsoft's 2025 global survey, education is now the **highest-adopting industry for generative AI**, with **86% of institutions reporting active use**—a surge driven by the urgent need for personalization, learning recovery, and operational efficiency. Students, too, have embraced AI: their usage jumped by **26 percentage points within a year**, while educator usage rose by **21 percentage points**, signaling a shift from skepticism to reliance. [ai4edu.eu]

But adoption is not merely about usage—it's about **impact.** And around the world, teachers are reporting that AI is reshaping learning dynamics inside classrooms. In the United States, a detailed analysis from Carnegie Learning found that teacher AI "power users" doubled between 2024 and 2025. These teachers consistently describe how AI helps them craft better materials, differentiate instruction, and reduce time spent on administrative tasks, freeing them to engage more deeply with learners. [ciddl.org]

This shift is especially visible in districts like **Fulton County Schools**, where AI chat tools were intentionally woven into everyday learning. Students used AI to brainstorm, explore ideas, and collaborate—resulting in noticeable increases in **confidence, curiosity, and classroom participation**. AI became less of a machine and more of a creative partner, a catalyst for conversation and inquiry.

Beyond K–12, the **higher education sector** is experiencing its own transformation. The World Bank's 2025 brief on AI in higher education reveals how AI tutors and predictive learning systems are helping students master difficult concepts **more efficiently than traditional approaches**, especially in gateway courses where many struggle. Some universities found that well-designed AI tutoring systems improved placement accuracy and supported learners who otherwise would have fallen behind. [chemrxiv.org]

While outcomes are improving, the market outlook reveals an equally important trend: AI adoption is becoming **strategic**. HolonIQ's 2025 Global Education Outlook shows that the global education economy is on track to reach **nearly USD $10 trillion by 2030,** with AI-driven technology playing an increasingly central role. The initial wave of excitement has given way to "practical implementation"—schools and EdTech companies are embedding generative AI directly into learning platforms, assessment engines, and curriculum workflows.

Everywhere, the expectation is not just to use AI but to **prove that it works**. Institutions want evidence that AI meaningfully enhances learning outcomes—improving literacy, strengthening conceptual understanding, reducing teacher workload, and promoting student agency.

Yet, the narrative is incomplete without acknowledging the gaps. The same Microsoft 2025 survey that revealed explosive adoption also revealed a sobering truth: less than half of educators globally feel prepared to use AI, and many students say they have received **no training at all.** This mismatch between institutional optimism and user readiness threatens to widen inequities rather than close them. [ai4edu.eu]

RAND's 2024–2025 studies echo this concern, showing that AI usage is significantly lower in **high poverty schools**, where infrastructure, training, and guidance lag behind wealthier districts. Without targeted investment, the students who stand to benefit the most may be the last to access AI's advantages. [ciddl.org]

Still, the narrative remains one of progress. Around the world, education leaders increasingly see AI not as a threat to teaching—but as a **force multiplier** that elevates teachers, empowers students, and accelerates personalized, mastery-based learning. Whether in U.S. districts experimenting with collaborative AI tools, global universities adopting AI tutors, or markets moving rapidly toward embedded AI features across EdTech offerings, the trajectory is clear: AI is reshaping learning outcomes in ways that are practical, measurable, and transformational.

The next chapter in this story will depend on responsible implementation—ensuring that every learner, regardless of background, can benefit from AI-driven insights, personalized support, and richer learning experiences. But the foundation has been laid: AI is no longer an experiment. It is now one of the most powerful levers available to help students thrive in a rapidly changing world.

For a modern EdTech company, the challenge is no longer whether to adopt AI—but how to **infuse AI consistently, safely, and at scale** across dozens of products, platforms, and learning experiences. This is where an **Infosys AI-First GCC (Global Capability Center)** becomes a structural advantage. The GCC acts as a unified engine that industrializes AI adoption—moving beyond scattered pilots to a coordinated, enterpris- wide transformation.

1. A Central AI Innovation Engine Instead of Fragmented Experiments

Most EdTech companies run AI pilots in isolated pockets—one product team experimenting with AI content generation, another trying adaptive pathways, another dabbling in LLM chatbots. Progress is uneven, governance is inconsistent, and synergy is lost.

An AI-First GCC changes this dynamic by creating **a single, centralized innovation hub** that:

- Runs **AI sandboxes** for safe model experimentation
- Builds **reference architectures** reusable across products
- Provides **shared AI microservices** (grading, summarization, personalization, translation)
- Ensures **responsible AI governance** across the entire product suite

This transforms AI from ad-hoc add-ons into **core platform capabilities**, accelerating infusion across all learning products simultaneously.

2. Scaled Talent, Not Scattered Skill Sets

EdTech companies face a chronic shortage of AI/ML talent. Infosys' GCC model solves this by rapidly onboarding, training, and integrating specialist teams at scale—often **80+ resources across 20+ product lines**, as demonstrated in prior partnerships.

The GCC provides:

- **Cross-functional squads** (ML engineers, data scientists, curriculum SMEs, cloud architects)
- A **shared AI skills academy** aligned with the company's roadmap
- Governance to distribute the right talent to the right product teams

Instead of each product team competing for scarce AI talent, the GCC becomes a **talent multiplier** that infuses AI expertise everywhere.

3. Faster, Safer Product Modernization Through AI Sandboxes

AI adoption stalls when teams fear compliance, bias, or data privacy risks. Infosys mitigates this by delivering:

- **Isolated AI sandboxes** for model testing using de-identified or synthetic data
- Prebuilt **risk assessment frameworks** for FERPA, COPPA, GDPR, and global privacy norms
- Automated **bias-audit pipelines** aligned to ethical AI standards

This lets product teams innovate confidently, with compliance engineered into the process rather than added as an afterthought.

4. Multilingual, Inclusive AI for Global Learning Products

Most EdTech companies need to serve diverse learners across regions. Infosys GCCs bring:

- **Fine-tuned multilingual models** (English + Indian + global languages)
- Grade-level, age-appropriate language simplification
- Models that adapt to **dialects and cultural context**

This allows products to expand globally and improves **equity**, ensuring no learner is left behind.

5. Enterprise AI Microservices That Plug Into Every Product

Instead of reinventing AI capabilities in every product team, the GCC builds enterprise AI services that plug into any platform:

- AI writing & assessment copilots
- Adaptive practice engines
- Summarization, translation, and leveling APIs
- AI tutor frameworks

Progress-monitoring and early-warning models

These shared microservices reduce time-to-market and ensure **standardization**, reducing technical debt in the long term.

6. Agentic Automation to Amplify Learning & Teaching Workflows

Infosys' GCC introduces **agentic AI patterns**—monitoring, analysis, and notifier agents—to augment both teacher and student workflows:

- Monitoring agents flag disengagement
- Analysis agents recommend instructional strategies or practice sets
- Notifier agents communicate nudges to teachers, students, and caregivers

These automations turn data into **real-time actionable insights**, improving learning outcomes across products.

7. Operational Continuity & Product Reliability at Scale

With 20+ learning products, continuity is critical. Infosys reinforces stability through:

- **Structured knowledge-transition**
- **24×7 MLOps and observability**
- Model versioning and drift detection
- Redteam testing for AI safety

This ensures that AI-enhanced learning experiences remain **reliable, robust, and safe** across millions of users.

8. Converting AI Pilots Into Enterprise-Wide ROI

The biggest value of a GCC is not in pilots—but in **scaling what works.**

Infosys ensures:

- AI outcomes are tied to learning metrics
- Successful patterns are templatized across product lines
- Leadership receives unified analytics on AI impact
- Product modernization aligns with business strategy

This turns AI from an innovation lab curiosity into a **strategic, measurable growth engine.**

GenAI and Agentic AI at Scale in Education

To complement the strategic and outcomes-focused narrative, this section outlines **how Generative AI (GenAI) and Agentic AI capabilities were industrialized and delivered** at scale across diverse educational use cases. The focus is on technical rigor, architectural consistency, and responsible AI delivery—showing how AI moved from experimentation into day-to-day learning workflows.

Reference Architecture for Scaled AI Delivery

All AI capabilities were delivered through a **modular, cloud-native platform architecture** designed to be reusable across multiple products and use cases. Rather than building isolated AI features, the architecture provides a shared backbone that supports governance, experimentation, and scale.

At the front of the stack is the **experience layer**, where AI capabilities surface inside existing educator and student interfaces. These include dashboards, authoring tools, assessment views, and embedded copilots that feel native to the product experience.

Behind the experience layer sits **an agent and orchestration layer**, where task-specific agents coordinate multistep workflows. These agents retrieve context, apply reasoning, generate responses, validate outputs, and trigger follow-up actions using a **planner–executor–validator pattern** to improve reliability and consistency.

The **model layer** provides access **to large language models through managed inference services**, rather than hosting or training models internally. Foundation models are consumed via **Azure OpenAI Service and cloudmanaged model catalogs (such as Amazon Bedrock),** with no persistent model ownership or lifecycle management required. Models are selected and routed dynamically at inference time based on task requirements—such as content generation, evaluation, summarization, or explanation—allowing multiple use cases to share a common, governed AI infrastructure while remaining flexible to adopt newer models as they become available.

To ground responses in trusted instructional material, a dedicated **Retrieval-Augmented Generation (RAG)** layer connects models to curriculum content, standards, policy documents, and professional development resources stored in vector stores. Retrieval combines semantic search with structured filters such as grade level, subject area, and jurisdiction.

Underlying these layers is a **data and signals layer**, which processes student submissions, assessment artifacts, and learning telemetry through de-identified and policy-compliant pipelines. Finally, all responses flow through an evaluation, safety, and governance layer that enforces quality checks, content moderation, bias detection, and human review for high-impact scenarios.

Use Case Delivery Through Reusable AI Patterns

Across products, AI was applied through reusable patterns that embed directly into educator and learner workflows.

Rubric-guided AI evaluation for short writing and essay responses, generating criterionlevel feedback and improvement suggestions; **authoring tools** expose **prompt-driven content creation** that drafts lessons aligned to subject, grade, objectives, and tone; professional development chatbots ground answers in curriculum and PD materials using **RAG with citations** and graceful fallbacks; **communication drafting assists educators** in composing clear, empathetic messages to students and families with adjustable tone and audience; standards alignment supports both mapping existing rubrics to standards and generating new rubrics from selected standards using an ontology-backed approach; and **long-context document assembly pipelines** transform serialized curriculum into compliancealigned teacher support and regulatory documents, reinforced by automated structure and consistency checks.

Together, these patterns rely on **managed LLM inference (Azure OpenAI and catalogbased models), agentic orchestration, and retrieval over scalable vector indexes** to ensure accuracy, reusability, and scale within familiar product experiences.

Built-In Evaluation, Safety, and Responsible AI

Across all patterns, responsible AI controls are built directly into the delivery lifecycle. Generated content is continuously evaluated against task-specific quality goals, filtered for unsafe or biased responses, and reviewed by humans when stakes are high. Independent evaluation frameworks are integrated to measure faithfulness, relevance, and instructional value over time.

Embedded AI Within Existing Products (Adoption-by-Design)

A core principle of this approach is that **AI capabilities are embedded within existing educational products rather than offered as standalone tools**. Educators and students encounter AI assistance naturally within familiar workflows—while grading, creating content, reviewing student work, or planning instruction—without needing to adopt new systems or behaviors.

This integrationfirst model reduces friction, accelerates adoption, and strengthens trust. Because AI operates within the surrounding instructional context, responses remain aligned to curriculum, standards, and prior activity. Technically, this is enabled through shared AI microservices, agent orchestration layers, and RAG pipelines that can be plugged into multiple products while preserving consistent user experience. AI functions as an invisible accelerator inside the product, not a separate destination.

Why This Matters

This technical approach demonstrates how GenAI and Agentic AI can be **industrialized for education at enterprise scale.** By focusing on embedded delivery, reusable architecture, grounded generation, and rigorous evaluation, AI becomes a trusted copilot for educators rather than a novelty or risk. The result is sustained adoption, measurable impact, and a repeatable blueprint for scaling AI responsibly across diverse learning ecosystems.

Case Study: AI-First GCC Partnership with a Large K–12 Curriculum Provider

Infosys established an **AI-First Global Capability Center (GCC)** for a leading K–12 curriculum provider, transforming how AI innovation, product modernization, and operational scale were delivered across their ecosystem. The GCC model enabled **rapid onboarding of 80+ specialists** across **21 product lines**, supported by industrialized talent governance and capability building.

Innovation was accelerated through **AI hackathons, agentic-workflow prototypes**, and a structured **AI skills academy** that uplifted teams while maintaining compliance and safety. Infosys' GCC deployed **AI Sandboxes** for controlled experimentation, allowing product teams to safely test generative models, automate content workflows, and evaluate learning impact without exposing sensitive student data.

To support diverse learners, the GCC fine-tuned **multilingual and grade-appropriate models**, enabling inclusive content generation and robust alignment to state standards. **Parallel knowledge-transition frameworks**, combined with continuous risk assessments, ensured resilience and zero disruption across mission-critical academic delivery cycles.

Conclusion

As education systems across the world navigate rapid technological change, AI has emerged not just as a promising innovation but as a decisive force reshaping how learning happens. The global signals are unmistakable: institutions are moving beyond experimentation toward scaled adoption, driven by the need for personalization, recovery from learning loss, operational efficiency, and future-ready skills. Research from OECD, UNESCO, and the World Bank underscores that AI's potential is vast—but fully realizing its value requires disciplined implementation, robust governance, and a commitment to equity.

At the same time, real-world adoption patterns reveal a system in transition. While AI usage among students, teachers, and institutions is accelerating at historic rates, readiness remains uneven, and gaps in training and infrastructure risk widening disparities. The most successful adopters are those treating AI not as a standalone tool, but as a catalyst for rethinking pedagogy, curriculum, assessment, and teacher support.

Against this backdrop, Infosys' AI-First GCCmodel provides a powerful blueprint for educational transformation. By centralizing AI innovation, industrializing talent, operationalizing responsible AI, and offering enterprise-grade MLOps and governance, the GCC enables EdTech companies and education providers to scale AI safely and consistently across product ecosystems. As demonstrated in the K–12 curriculum provider case, Infosys' GCC approach converts fragmented pilots into standardized, compliant, multilingual, and measurable solutions—delivering improved learner engagement, stronger instructional workflows, and resilient operations across 21 product lines.

Ultimately, the path forward for AI in education lies in pairing cutting-edge technology with human-centered practice. When AI is infused with care—aligned to teacher capacity, cultural inclusivity, ethical safeguards, and evidence-based measurement—it becomes a multiplier of what great educators already do. It expands access, deepens personalization, and brings every learner closer to their full potential.

The opportunity is no longer theoretical; the foundation has been laid. What remains is a collective responsibility: to scale AI with integrity, to design for equity from the start, and to ensure that every advancement in technology translates into meaningful, lasting improvements in teaching and learning. With its AI-First GCC capabilities, Infosys stands ready to help education systems make that leap—responsibly, sustainably, and with a measurable impact on learning outcomes.

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