

Quantum Is Coming. L&D Must Get There First.
GOAT LEARNING®



By building quantum literacy, reshaping learning ecosystems, and preparing the workforce for a deep-tech revolution that will rewrite skills, security, and strategy, L&D can transform quantum from a distant disruption into a competitive advantage.

Most organizations imagine quantum computing as a far-off breakthrough. A distant horizon. A problem for R&D, not for people.

And yet the timeline is collapsing. Quantum advantage — the moment quantum machines outperform classical ones for specific tasks — is now projected within the next few years.

Quantum job openings already outnumber qualified candidates by a factor of three. And the technology's trajectory is unmistakable: from labs to commercial pilots, from research to real use cases, from theoretical physics to business disruption.

But here's the twist: The biggest barrier to quantum adoption isn't the hardware. It's the **skills gap**.

Quantum will not fail because it's complex. It will fail — or succeed — depending on whether organizations can learn fast enough.

And that makes this next technological shift fundamentally a learning challenge.

Quantum Requires a New Kind of Skill — And a New L&D Mindset

Quantum is not like AI, software, or cloud. It doesn't simply add new tools. It rewrites foundational concepts: computation, encryption, optimization, modeling.

This creates a new spectrum of skills:

- quantum literacy for non-experts
- hybrid roles (quantum + data, quantum + AI, quantum + business)

- advanced skills (algorithms, error correction, qubit systems, post-quantum cryptography)
- interdisciplinary competencies (math, physics, engineering, computing)

Workforce needs are shifting from specialists only to **broad, diverse, multi-disciplinary talent ecosystems**. Roles are emerging faster than universities can train for them.

Demand grows — and supply doesn't.

For L&D, this requires an entirely new approach:

- From upskilling → to **building new skills pipelines**
- From job-based training → to **capability-based ecosystems**
- From content delivery → to **strategic workforce shaping**
- From traditional curricula → to **deep-tech learning architectures**

Quantum isn't just another learning theme. It is the moment L&D evolves into a force that shapes what a company *can* become.

Quantum Will Reshape Industries — Long Before It Hits Production

Quantum's early impact will not come from machines replacing classical systems at scale.

It will come from organizations that **understand the implications first**.

Sectors already anticipating disruption include:

- cybersecurity (post-quantum encryption becomes mandatory)
- finance (modeling, risk, optimization)



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- supply chains (logistics, routing, resilience)
- pharmaceuticals (molecule simulation)
- energy (material science, fusion research)
- climate technologies (simulation, forecasting)

Quantum advantage will arrive in **waves**, unevenly, across industries. This unevenness creates competitive asymmetry: Organizations with quantum-ready teams will move faster than those who wait.

For L&D, the implication is simple: **learning must begin before disruption is visible.**

This is not “train when needed.” This is “train because the world is already shifting.” Quantum literacy becomes a strategic hedge — and a differentiator.

L&D Must Prepare Three Populations — Each with Different Needs

Quantum transformation will not be driven by physicists alone. L&D must enable three distinct groups.

1. Leaders

They need the ability to think clearly about:

- quantum timelines
- strategic relevance
- risk (especially cybersecurity)
- investment decisions
- ethical and regulatory implications

Leadership cannot steer a quantum future if they cannot *understand* it.

2. Technical teams

Engineers, developers, analysts require:

- exposure to quantum concepts
- pathways into specialized training
- hands-on labs, simulators, demonstrators
- partnerships with universities and research institutions

They are the foundation of quantum capability.

3. General workforce

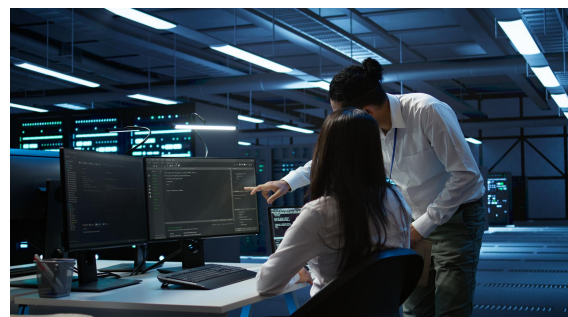
Most employees will not become quantum engineers.

But they will need:

- quantum awareness
- understanding of post-quantum security
- confidence navigating new systems
- clarity about what changes — and what doesn't

If the workforce does not understand the shift, resistance rises.

Quantum readiness is organizational — not just technical.



Learning Ecosystems Must Evolve to Support Quantum Adoption

Quantum learning requires environments that can support **deep, complex, evolving knowledge**.

This means L&D must redesign ecosystems around:

Hyper-specialized content

Partnerships with academic institutions, research labs, deep-tech providers.

Adaptive, multi-level pathways

From beginner literacy to expert tracks.

Simulation-based learning

Quantum simulators, sandboxes, low-risk experimentation.

Cross-disciplinary programs

Physics + engineering + computer science + business integration.

Talent pipelines

Apprenticeships, early talent programs, internal mobility.

Internal communities of practice

To share discoveries, experiments, and use cases.

Quantum learning cannot be “just another module.”

It must be an ecosystem.

The Human Impact: Curiosity, Confidence, and Deep-Tech Culture

Quantum may intimidate. It certainly overwhelms. But it also energizes.

It opens space for curiosity, experimentation, and ambition.

It gives employees a sense of participating in the next scientific revolution.

It elevates learning beyond skill acquisition — toward intellectual empowerment.

This shift requires psychological safety:

- permission to not understand everything
- encouragement to explore
- recognition of incremental progress

For L&D, quantum is an opportunity to cultivate a **deep-tech learning culture** where complexity is not a barrier but an invitation.

Leadership Must Anchor the Transition

Quantum readiness is fundamentally a leadership responsibility.

Leaders must:

- sponsor long-term learning investments
- legitimize quantum upskilling before ROI is visible
- model curiosity and humility
- communicate clear narratives about quantum’s impact
- integrate quantum with AI, cybersecurity, and strategy

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- build partnerships across academia, government, and industry

Without executive sponsorship, L&D cannot build quantum capability at scale.

With it, quantum becomes a strategic advantage.

Quantum Is Not Waiting. Neither Can L&D.

Quantum computing is not yet mainstream — but its trajectory is irreversible. Its impact will be uneven, complex, and transformative. And the organizations that win in the

quantum era won't be the ones with the best hardware.

They will be the ones with the strongest **learning ecosystems**, the broadest **talent pipelines**, and the boldest **leadership commitment**.

Quantum is coming. But readiness is a choice.

And L&D holds the key to making that choice possible — today.

If L&D can build the systems, culture, and capabilities to prepare for the quantum wave, it won't just support the business. It will shape its future.

Quantum may still feel distant—but the preparation window is already open.

If you're thinking about how L&D can prepare people and leaders for what's coming, reach out to us at emilie@goat-learning.com.

The biggest barrier to quantum readiness isn't technology—it's capability.

Contact us at emilie@goat-learning.com to discuss how learning can start building quantum readiness today.

Quantum will require new skills pipelines, not just specialist training.

If you're exploring how to shape long-term talent ecosystems for deep tech, let's talk at emilie@goat-learning.com.

Preparing for quantum starts with curiosity, confidence, and learning culture.

Reach out at emilie@goat-learning.com to explore how L&D can make deep-tech learning accessible—not intimidating.



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À propos de GOAT LEARNING®

GOAT LEARNING® est une société de conseil, d'intégration et d'outsourcing spécialisée dans les solutions EdTech et Learning. Forte de plus de 15 ans d'expérience du marché et de collaborations avec des groupes Global 500 et SBF120, elle accompagne les entreprises dans la conception, la sélection, le déploiement et l'optimisation de leurs écosystèmes de formation. Positionnée comme Trusted Advisor, GOAT LEARNING® conjugue expertise technologique, compréhension fine des enjeux Learning & Development et exigence d'exécution pour transformer les investissements learning en leviers concrets d'upskilling, de développement des skills, d'engagement des apprenants et de performance durable. Son approche s'inscrit pleinement dans les dynamiques de Skills Based Organization, afin d'aider les entreprises à mieux aligner leurs stratégies talents, leurs priorités business et leurs dispositifs de formation. Grâce à un écosystème réunissant plus de 24 partenariats stratégiques et 250+ fournisseurs de contenus, technologies et services, GOAT LEARNING® poursuit une ambition simple : faire de la formation un actif stratégique, mesurable et créateur de valeur pour l'entreprise.

About GOAT LEARNING®

GOAT LEARNING® is a consulting, integration, and outsourcing firm specialized in EdTech and Learning solutions. Backed by more than 15 years of market experience and collaborations with Global 500 and SBF120 companies, it supports organizations in the design, selection, deployment, and optimization of their learning ecosystems. Positioned as a Trusted Advisor, GOAT LEARNING® combines technology expertise, a sharp understanding of Learning & Development challenges, and strong execution capabilities to turn learning investments into tangible drivers of upskilling, skills development, learner engagement, and sustainable performance. Its approach is fully aligned with Skills Based Organization dynamics, helping companies better connect their talent strategies, business priorities, and learning initiatives. Through an ecosystem of more than 24 strategic partnerships and 250+ content, technology, and service providers, GOAT LEARNING® pursues a simple ambition: to make learning a strategic, measurable, and value-creating asset for the business.



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