

Disrupting the disruptors: Rebooting academia's commercialization playbook



Raghupathy Sivakumar, Chief Commercialization Officer at Georgia Tech
Ángel Cabrera, President of Georgia Tech

Overview

Research has been part of the core mission of an increasing number of American universities since the late 19th century, when Johns Hopkins University pioneered the idea on this side of the Atlantic. Today, universities in the United States of America (US) spend over USD 104 billion on research, and more than half of this amount is supported by the federal government (Association of University Technology Managers (AUTM), 2024; National Science Foundation (NSF), 2024). With that amount of public funding, it is reasonable for taxpayers to expect real societal benefits. University-based research has produced technologies with great commercial and military value, as well as dramatic improvements in medicine and health care. Less immediately beneficial, but equally important, university research has expanded our understanding of the world we inhabit. Increasingly, though, politicians and the people they represent have questioned whether the returns are worth the investment, and universities have had no choice but to actively find ways to accelerate and amplify the impact of their research.

To illustrate this point, in 2024, US universities collectively spent over \$104 billion on research and generated 915 startup companies, implying an average of more than \$110 million in research expenditure per startup (AUTM, 2024). While a substantial proportion of academic research focuses on fundamental discovery and includes various avenues for translational research, not all university research is intended to generate startups (Bush, 1945). Thus, the scale of public investment makes it reasonable to ask how effectively universities convert research outputs into economic and societal outcomes through the creation of new businesses.

These concerns are not new. Similar questions raised in the 1970s led to the Bayh–Dole Act of 1980, which formalized the expectation of economic and social impact of research by enabling universities to retain ownership of intellectual property (IP) arising from federally sponsored research and incentivizing them to commercialize IP in service of their broader missions. Contrary to early fears, history has shown that the impetus toward commercialization has not been at odds with the central goal of advancing knowledge. Rather, science-based entrepreneurship has been shown to complement and even amplify traditional academic output (Azoulay *et al.*, 2009; Reinmuth, 2025; Scharfmann, 2025).

At Georgia Tech, we have confronted this question directly and have accepted the goal of leveraging the conventional commercialization model that emerged following Bayh–Dole to drive significant growth in science-based entrepreneurial outcomes. For context, Georgia Tech accounts for almost \$1.5 billion in research expenditures and ranks second only to Johns Hopkins University in federal research awards (National Science Foundation, 2024). As one of the nation's most research-intensive universities and a public asset of our state, we articulated an explicit institutional commitment to expanding the scale and societal impact of our research enterprise and to building a nationally competitive hub for innovation and entrepreneurship anchored around our campus. Central to this aspiration is a goal of enabling the launch of 1,000

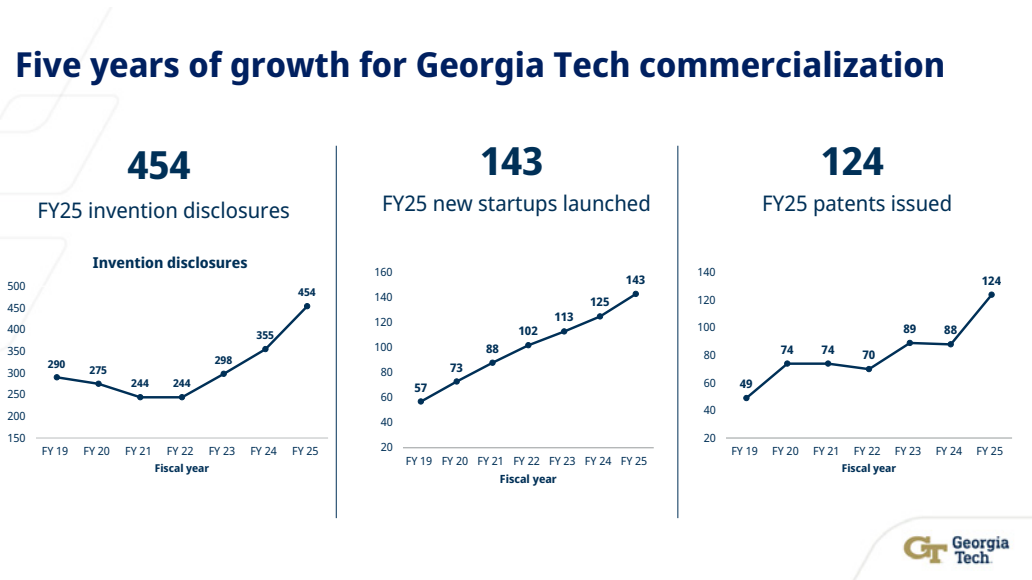
startups per year, inclusive of all sectors, by 2035 – an admittedly ambitious goal that requires a fundamental reexamination of how science-based entrepreneurship is designed, supported and activated within our institution.

Our approach shed the traditional, scarcity-oriented model, characterized by centralized selection of “winners,” tight control of IP and limited allocation of entrepreneurial resources, for a model that emphasizes catalysis over control, pathways over barriers and early integrated engagement over downstream intervention. Entrepreneurship is treated not as a post hoc activity applied to a small, select subset of research outputs, but as a capability that can be systematically developed and broadly deployed across the research enterprise. This shift has led to a **fivefold increase** in overall entrepreneurial activity at Georgia Tech over the last decade.

Georgia Tech is not alone in advancing a science-based entrepreneurship playbook; many peer institutions reflect important elements of this approach. The University of California, Berkeley, has built a strong culture of student entrepreneurship and consistently produces leading founders, while Carnegie Mellon University has pioneered equity-based express licensing models. In Europe, Cambridge University and Oxford University have cultivated deep commercialization ecosystems through strong ties to venture capital and science parks. In Asia and the Middle East, the National University of Singapore and Tsinghua University have built strong university-linked innovation ecosystems. Innovation districts also reinforce these efforts; for example, the Ion district at Rice University reflects a broader trend of creating ecosystems around campuses to catalyze entrepreneurial activity. However, we have learned that cohesively aligning culture, policy, infrastructure and capital can lead to a robust playbook that accelerates science-based venture creation.

In the remainder of this paper, we describe the key elements of the Georgia Tech playbook, as well as several approaches that did not yield the intended results. Our objective is not to present a universal blueprint, but to offer a set of design principles and institutional choices that may be adapted by other universities seeking to more effectively translate research into societal impact at scale.

Figure 1 Georgia Tech FY25 commercialization metrics: invention disclosures, startups launched and patents issued (FY21–FY25)



Notes: The metrics in the figure are based on data from FY21 to FY25, showing steep growth in relation to invention disclosures, new startups launched and the number of patents issued. At Georgia Tech, “invention disclosures” count the number of formally submitted written disclosures of a new invention, “patents issued” refers to US patents issued by the United States Patent and Trademark Office (USPTO) and “new startups launched” refers to new ventures with the intent to incorporate.

Source: Authors’ compilation, adapted from Georgia Institute of Technology (2025). © 2025 Georgia Institute of Technology.

Playbook and strategies

It's a numbers game

Many elite research universities are built around a culture of selectivity. Low acceptance rates in admissions, grading curves, peer-reviewed publications and competitive research funding turn scarcity into a proxy for excellence. This ethos naturally extends into how universities support science-based entrepreneurship. Faculty, students and researchers are routinely asked to prove the “worthiness” of their ideas through a sequence of selective gates, such as pitch competitions or grant applications. Selectivity is largely misaligned with the goal of scaling science-based entrepreneurship. Especially at universities where entrepreneurial culture may still be underdeveloped, it is reach, not refinement, that is most needed: a broad, visible and normalized culture in which faculty and students routinely consider entrepreneurship as a legitimate pathway to impact. More fundamentally, selectivity presumes an ability to identify superior opportunities early in the entrepreneurial pathway. In science-based entrepreneurship, this assumption is rarely, if ever, valid. At the point where university-originated ideas first begin to germinate, it is virtually impossible to distinguish future successes from failures with any reliability. As a result, early selectivity fails to improve outcomes and also sends discouraging signals to capable faculty and students whose ideas are rejected, often for reasons that have little to do with their ultimate potential. In this context, emphasizing quantity is not a lowering of standards but a recognition of how innovation actually works.

At Georgia Tech, we have deliberately taken a different approach over the past decade by scaling the number of entrepreneurial efforts we support. Central to this effort has been the creation of a coherent pathway of resources spanning the stages of what we call *learn, make, launch, accelerate* and *scale*. This pathway allows us to support ventures at many points of maturity and, critically, to redirect teams rather than reject them. When a faculty member or student is not ready for one stage, they are guided to another that better fits their current needs. The result is a system in which participants experience continuity of support rather than binary outcomes.

This emphasis on volume, pathways and redirection has enabled entrepreneurship to become more visible, accessible and normalized across campus. Over the past decade, this approach has contributed to a more than fivefold increase in the number of ventures launched annually, demonstrating that, in science-based entrepreneurship, scale is not the enemy of quality, but a prerequisite for it.

Students are the key

Science-based entrepreneurship in academia has traditionally been structured around faculty as the primary actors. Most programs, incentives and support systems, including IP guidance through technology transfer offices, non-dilutive commercialization grants and startup leave policies, are designed with faculty-led ventures in mind. Student involvement, while common, is typically secondary and contingent on faculty engaging students from their research labs in entrepreneurial efforts.

This faculty-centric model is necessary but woefully insufficient. Faculty constitute a relatively small fraction of the campus population, making them an inherently constrained lever for cultural change at scale. Moreover, faculty operate under significant competing demands, including teaching, service, research, fundraising and student mentorship, leaving little time for startup formation.

A complementary, more scalable strategy is to place much greater emphasis on students as active participants in science-based entrepreneurship. Students outnumber faculty by a factor of 10 to 20 at typical research universities and have greater flexibility in how they allocate their time, facing fewer long-term structural and risk constraints. Importantly, entrepreneurship serves a dual purpose for students. It is not only a pathway to venture creation, but also a powerful educational experience that builds skills in value creation, adaptability and navigating uncertainty – capabilities that remain valuable regardless of eventual career outcomes (Lin *et al.*, 2025; McCarthy *et al.*, 2023; Manso, 2016).

At Georgia Tech, we have intentionally redesigned entrepreneurship platforms to place students at the center of the ecosystem. This shift has reframed entrepreneurship not only as a mechanism for launching high-impact ventures but also as a core component of student development that complements traditional technical education. Doing so has required us to recognize that students need different forms of support than faculty. Students are far more likely to engage deeply when entrepreneurial activity aligns with their academic progress. One effective mechanism has been the integration of entrepreneurship with the curriculum, including giving students the ability to earn academic credit as they move forward in their entrepreneurial journey.

The results of this student-centered approach have been transformative. Students engaged in entrepreneurship at Georgia Tech span more than 35 majors and include both undergraduate and graduate populations. In the most recent year, out of the 143 startups launched, more than 85 percent were founded by students, and more than 5,000 students participated in some form of entrepreneurial activity. This level of engagement has fundamentally reshaped campus culture, normalizing entrepreneurship as a widely accessible pathway for impact and learning.

Embed commercialization into the academic fabric

Of course, faculty remain core to our entrepreneurial efforts, both as mentors of students and as a source of innovative ideas themselves. On most university campuses, though, commercialization support is structured to engage only after research has largely concluded in the laboratory. Faculty disclose inventions; IP protection is pursued, and – sometimes much later – commercialization through science-based entrepreneurship is considered. In this model, commercialization is treated as an adjunct to the core academic mission rather than as an integrated component of it.

However, an after-the-fact approach to commercialization creates significant barriers to scaling entrepreneurial activity. First, many faculty never take the additional step toward commercialization once traditional research outcomes are achieved, and the add-on model does little to counteract this default stopping point. Second, when research and commercialization are separated by a sharp boundary, research problems are often defined without sufficient grounding in real-world constraints. As a result, promising discoveries may require substantial rework to become commercially viable outside of a lab. Finally, episodic engagement limits the development of trust between faculty and the commercialization ecosystem. Without sustained interaction, entrepreneurship support teams are perceived as transactional service providers rather than as long-term partners.

To overcome these limitations, at Georgia Tech we have deliberately evolved the commercialization infrastructure to function as an end-to-end service that is embedded throughout the research life cycle. Engagement begins as faculty are shaping research questions, continues during the execution of the research and extends seamlessly into technology transfer and venture formation when the work is ready for translation. In this model, commercialization is not a switch that is flipped at the end, but a set of capabilities that faculty can draw upon continuously to strengthen both their research and its eventual impact.

In the first two years, student entrepreneurship assistants are embedded within faculty research labs, where their sole focus is to explore market relevance and potential use cases for ongoing research. Their analysis often informs future ventures, as well as the framing of research papers, grant proposals and broader research agendas. After that, “research next” grants are awarded, which support the evolution of foundational research toward more solution-oriented directions without requiring an immediate commitment to commercialization. In three to four years, a faculty member might be ready for Startup Launch through Quadrant-*i*, a dedicated commercialization resource for faculty with IP spinouts. Once their startup has been launched, faculty can apply to be a Regents’ Innovator with the opportunity to take a leave of absence to pursue their startup. And a final step on the commercialization journey for faculty is often the title of Regents’ Entrepreneur for those who have successfully commercialized their IP.

Together, these mechanisms build trust, align incentives and reduce friction across the research-to-impact continuum. By treating commercialization as an end-to-end service,

universities can dramatically increase both the volume of entrepreneurial activity and the likelihood that research discoveries ultimately translate into meaningful societal impact.

Give intellectual property away for free

Following the Bayh–Dole Act, universities in the United States now retain ownership of IP arising from their research, including work supported by federal funding. Technology transfer offices have historically approached this responsibility with a cost-recovery and value-maximization mindset, seeking to recoup patenting expenses and capture future upside through a combination of up-front fees, reimbursement of IP costs and downstream royalties. In isolated cases, this approach has generated substantial returns for universities.

At scale, however, this model introduces significant friction into science-based entrepreneurship and ultimately limits its impact. Licensing negotiations are often slow and adversarial, stretching over many months and, in some cases, more than a year. Moreover, positioning the university as a counterparty seeking to extract value from founders risks eroding trust and undermining long-term relationships, including future collaborations, follow-on ventures and philanthropy.

A more effective approach is to treat IP licensing as both a part of the public mission of the university and an investment in future impact rather than a transactional revenue opportunity. At Georgia Tech, we have adopted an explicit investor mindset toward licensing university IP. Our objective is to maximize the number of ventures built on university discoveries and to remove structural impediments that slow or weaken those ventures at inception. To that end, we have designed a founder-friendly “express license” process that operates at startup speed and requires no up-front cash from the company. Instead, the university participates through equity, aligning its returns with the success of the venture rather than with early cost recovery.

The effects of this shift have been immediate and substantial. Licensing timelines improved. More importantly, founders and faculty experience the university not as a toll collector, but as a long-term partner invested in their success. By licensing IP liberally and aligning incentives around a shared upside, universities can dramatically increase entrepreneurial participation, accelerate venture formation and, ultimately, generate greater financial and societal returns than conservative licensing models allow.

Investigate the science of entrepreneurship

Like most administrative and operational units, university commercialization organizations often make decisions based on a mix of conventional wisdom, practical constraints and institutional practices. In the absence of well-established principles, such approaches are understandable. Common examples include delaying patent filings until a potential licensee expresses interest to manage IP costs or optimizing internal metrics to align with external rankings whose underlying methodologies are only partially transparent.

However, scaling science-based entrepreneurship and earning the sustained engagement of faculty requires a much higher standard of rigor. Faculty are accustomed to evidence-based reasoning and are understandably skeptical of decision frameworks that lack empirical grounding, particularly when those decisions demand significant investments of time, reputation and resources.

At Georgia Tech, we have addressed this gap by treating entrepreneurship itself as a domain worthy of systematic inquiry. We deliberately formulate research questions that arise directly from operational challenges in commercialization and invite faculty to investigate them using rigorous research methods. When these questions are answered, the results provide credible guidance for policy and operational decisions, informing our playbook. Equally important, the process signals to faculty that the entrepreneurship ecosystem is philosophically aligned with the academic enterprise – curious, analytical and committed to learning from evidence.

This approach has led to multiple active research streams focused on the practice of university entrepreneurship. Faculty have access to data, institutional context and, in some cases, targeted funding to study questions such as how science-based entrepreneurial activity should be objectively measured, how exposure to entrepreneurship affects student career and earnings

outcomes (Lin *et al.*, 2026) and whether emphasizing volume of activity necessarily involves a trade-off against quality (Pelaez *et al.*, 2025). Together, these efforts are shaping an evolving, evidence-based playbook for science-based entrepreneurship – one that is continuously informed by data, refined through experimentation and credible to the academic community it is designed to serve.

Build it, and they will come

Universities have traditionally focused their capital investments inward, prioritizing core academic infrastructure that lies squarely within institutional boundaries. This is understandable given funding constraints, governance structures and the complexity of real estate development when ownership and authority extend beyond campus lines. As a result, entrepreneurship infrastructure has often been treated as ancillary at best, if not out of the university's scope altogether.

In our experience, though, a thriving science-based entrepreneurship ecosystem depends critically on place and space. Innovation is catalyzed by density, proximity and repeated unplanned interactions among researchers, students, entrepreneurs, investors, corporate partners and customers. These “collisions” rarely occur in distributed or purely virtual environments. Equally important, the absence of basic physical infrastructure, like wet labs and offices, can stall even the most promising ventures.

Recognizing this, we have embraced the principle that capacity must precede demand, investing in environments that make entrepreneurship visible, accessible and contagious. In addition to a set of student-run makerspaces across campus, Georgia Tech has leveraged public-private partnerships and collaborated closely with state and local economic development organizations to intentionally transform the neighborhoods surrounding campus to support entrepreneurs.

The result is one of the most active technology and innovation districts (Spirou, 2021), organized into three complementary areas: Technology Square, Science Square and the Creative Quarter. Together, these districts comprise millions of square feet of purpose-built space that support entrepreneurial activity across the full life cycle. They are home to university programs, startups, corporate innovation centers, venture capital firms and essential service providers, creating a tightly coupled ecosystem that dramatically lowers friction for new venture formation.

By treating entrepreneurship as a place-based system and investing ahead of demand, universities can fundamentally change behavior. When the right spaces exist, populated by the right mix of people and resources, participation follows.

Experiment, fail fast and pivot hard

It is critical to recognize that no one-size-fits-all playbook for academic entrepreneurship exists, and that any effective playbook must be built for a specific institutional context. Developing such a playbook requires systematic experimentation, rapid learning and adaptation. All the strategies outlined earlier emerged from this experimental mindset. At the same time, not all strategies proved effective. Several approaches that were initially appealing did not generate the intended outcomes. We summarize a subset of these efforts below, which are likely to recur at other universities.

- **Application-driven commercialization mechanisms are poorly suited for deep-tech commercialization** A seemingly natural strategy was to connect entrepreneurially inclined students with university-generated IP and encourage company formation. While this approach can work in settings where technologies are easily understood and rapidly prototyped, our attempts to operationalize it through shallow-tech mechanisms, such as hackathons and short-cycle venture sprints, were largely unsuccessful. In retrospect, this outcome is unsurprising. Deep-tech IP typically involves substantial technical complexity and broad, underdetermined application spaces. These characteristics make such technologies promising research contributions but also render them ill-suited for formats that assume rapid problem definition, shallow technical engagement and immediate venture formation. While we continue to expose students to IP developed at Georgia Tech,

we no longer rely on short-form, application-driven commercialization mechanisms to encourage engagement with deep-tech assets.

- **Early-stage teams benefit more from mentorship than from capital** To scale entrepreneurship programs rapidly, we introduced a tier of “booster” teams – founding teams that were not admitted to the primary launch program but were offered limited funding without structured mentorship. This design choice was intended to relieve instructional bottlenecks while still enabling progress. Instead, we observed that these teams made little meaningful advancement compared to the teams with mentors who were not “boosted.” At the early stages typical of university-based founders, teams often lack the experience to productively deploy even modest amounts of capital without guidance. Structured mentorship and guided decision-making proved far more critical than funding alone. The booster program was subsequently discontinued.

These unsuccessful strategies highlight an important lesson: increasing science-based entrepreneurial output is not simply a matter of adding programs, capital or incentives. Institutional mechanisms must be appropriately matched to the nature of deep-tech research, the developmental stage of founders and the motivations of academic participants. Crucially, discovering these matches requires a willingness to experiment, to learn from failure and to pivot decisively.

University design principles for science-based entrepreneurship

For other universities that are interested in creating a playbook to elevate their own commercialization ecosystem, a few policy recommendations have emerged from Georgia Tech’s approach and results. First, universities must adopt a **scale-up model** for entrepreneurship across campus with high-volume, low-barrier pathways for students and faculty to launch startups and commercialize research. Second, **culture is critical** and must be part of the fabric of a university, inclusive of end-to-end research commercialization that normalizes entrepreneurial activity. For students, this means room to fail and pivot with full faculty support. Third, universities must adopt an **investor mindset**, creating a purpose-built innovation ecosystem across campus, not only for startup ventures, but also for licensing IP beyond the lab. Taken together, these policy recommendations shift universities toward an innovative mindset that intentionally expands access, accelerates translation and amplifies societal impact at scale.

Summary

Georgia Tech’s experience demonstrates that scaling science-based entrepreneurship is less a function of research quality or IP availability than of institutional design. By prioritizing volume over early selectivity, centering students as primary agents, embedding commercialization as an end-to-end service, removing IP friction, treating entrepreneurship as a researchable discipline and investing ahead of demand in place-based ecosystems, universities can substantially expand entrepreneurial participation and impact. The central lesson is that entrepreneurship at scale is not accidental – it is engineered through deliberate choices that align incentives, lower barriers and normalize experimentation across the academic enterprise.

References

Association of University Technology Managers (AUTM) (2024). *AUTM Annual Survey Report*. Washington, DC.

Azoulay, P., Ding, W., and Stuart, T. (2009). The impact of academic patenting on the rate, quality, and direction of public research output. *Journal of Industrial Economics*, 57(4), 637–676.

Bush, V. (1945). *Science The Endless Frontier*. Washington: United States Government Printing Office, 1945. 184 p. Sci. Ed., 29: 218-218. <https://doi.org/10.1002/sce.3730290419>

Lin, M., H. Qin, and K. Ramachandran (2026). Entrepreneurship Education Shapes Career Trajectories Beyond Entrepreneurial Intentions, *Working Paper, Georgia Institute of Technology*. Available at <https://tinyurl.com/entreduc2026>

Manso, G. (2016). Experimentation and the returns to entrepreneurship. *Review of Financial Studies*, 29(9), 2319–2340.

McCarthy, P.X., Gong, X., Braesemann, F. et al. (2023). The impact of founder personalities on startup success. *Scientific Reports*, 13, Article 17200.

National Science Foundation (2024). *Higher Education Research and Development Survey*, FY 2024. National Center for Science and Engineering Statistics, Alexandria, VA. Available at: <https://nces.nsf.gov/surveys/higher-education-research-development/2024>.

Pelaez, S., Yang, J.J., Ceccagnoli, M., and Walsh, J.P. (2025). More disclosure, better inventions? T2S Conference, Phoenix, AZ. Available at <https://spp.gatech.edu/publications/pubFile/8371>

Reinmuth, K. (2025). Striking the balance: University commercialization and scientific research productivity. *Stanford Journal of Law, Economics and Business*, 30, 455–489.

Scharfmann, E. et al. (2025). Pasteur's quadrant researchers bring novelty and impact to publishing and patenting. *Science*, 390, 891–893.

Spirou, C. (2021). *Anchoring Innovation Districts: The Entrepreneurial University and Urban Change*. Johns Hopkins University Press, Baltimore, MD.

Copyright

© WIPO, 2026

Attribution 4.0 International (CC BY 4.0)

The CC license does not apply to non-WIPO content in this publication.

WIPO Reference No. GII2026/EN/EXTCONT

DOI: 10.34667/tind.59195

Front image: Getty Images, Unsplash.