



Breadth of Practices in Academia-Industry Relationships

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Abstract

This report synthesizes insights from the CRA-Industry (CRA-I) workshop, *Breadth of Practices in Academia-Industry Relationships*. Faculty, academic leaders, and industry researchers examined collaboration models spanning research partnerships, personnel exchanges, master agreements, and regionally anchored ecosystems. Participants identified key barriers — misaligned incentives and timelines, limited access to cloud/GPU resources, and administrative friction — and highlighted workable solutions, including dual appointments, internships and co-ops, streamlined agreements, and co-developed curricula that embed ethics and real-world problem solving. The report organizes takeaways across research collaboration, education and workforce development, and scalable resource strategies. It concludes with recommendations for universities and companies to align incentives, invest in regional ecosystems, expand upskilling pathways, modernize curricula grounded in core computing principles, and adopt metrics that capture impact on research, innovation, and workforce readiness.

About CRA-Industry (CRA-I)

A standing committee of the Computing Research Association (CRA), CRA-Industry (CRA-I) convenes industry partners on computing research topics of mutual interest and connects them with CRA's academic and government constituents to advance shared goals and improve societal outcomes. Of, by, and for the computing research community, CRA-I recognizes the diversity of companies engaged in computing research and fosters open dialogue across sectors. Through these conversations, CRA-I identifies emerging trends, develops best practices, and produces whitepapers and reports that strengthen the computing research ecosystem and drive innovation benefiting industry and society alike.

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EXECUTIVE SUMMARY

This report captures the insights, practices, and strategies discussed during the *Breadth of Practices in Academia-Industry Relationships* workshop, hosted by CRA-Industry (CRA-I). In an era where computing and AI technologies are transforming every industry, academia-industry collaboration is critical for sustaining innovation and preparing a future-ready workforce. The motivation behind the workshop was to hear about the breadth of practices being employed by academia to interact with industry juxtaposed with industry perspectives on the collaborations.

The workshop brought together a wide range of participants including faculty members, department chairs, school directors, university administrators, a representative of an organization of universities, staff managing research programs, along with industry researchers and executives. Attendees represented a range of sectors and organizational levels, providing a comprehensive perspective on current challenges and opportunities in academia-industry collaboration.

The event featured a keynote address from a senior executive at a major technology manufacturer. It showcased a comprehensive long term academia-industry relationship, demonstrating how it matured and adapted over time to meet changing needs. Two interactive panels — focused on research and education — brought together senior leaders from prominent technology companies to share experiences, offer critical insights, and discuss actionable approaches to partnership. Six attendees presented five-minute lightning talks, as well as three 15-minute invited talks. These plenary conversations along with breakout group discussions inspired the contents of this report.

The recommendations, which involve university leadership and faculty, industry leadership and individuals, and possibly support from government, are as follows:

1. Enhance research impact by combining academia's long-term vision with real-world problems informed by industry.
2. Leverage the convening power of academic institutions to build partnerships with industry that benefit the broader community.
3. Accelerate workforce development through university programs, especially those supporting regional innovation ecosystems.
4. Deliver industry-relevant curricula grounded in core computing principles to prepare adaptable learners, while also supporting upskilling and reskilling initiatives for the current workforce.
5. Establish incentives and metrics to evaluate the impact of academia-industry collaboration.

INTRODUCTION

An extensive industry/academia report was published by Computing Research Association (CRA) in May 2020,¹ which includes results of a detailed survey. One of the key recommendations from that report was “*Create a follow-on report on best practices for departments and companies in industry/academia engagements related to computing research.*” This report addresses this recommendation although our emphasis is on a breadth of practices rather than best practices as best practices vary with the circumstances. Related to this goal, in 2022 CRA-I organized a virtual roundtable entitled, “Building Stronger Regional Academia-Industry-Government Computing Research Partnerships”.² The roundtable highlighted how regional partnerships, which were termed *ecosystems* during the roundtable, can drive economic development when supported by (typically, state or local) government funding and advocacy. The importance of strengthening regional ecosystems is highlighted throughout this report. A recent whitepaper (April 2025) jointly issued by CRA and Computing Community Consortium (CCC) also addresses industry engagement with academic research and provides additional ideas.³

The *Breadth of Practices* workshop convened thought leaders representing a variety of roles in academia and industry, exploring the range of relationships with the goal of providing guidance to the community on how to strengthen such relationships in their own organizations. The workshop's main objectives were the following:

1. Present and amplify effective models for collaboration; and,
2. Discuss the alignment of curricula and training with emerging workforce demands. Workshop attendees identified opportunities for industry and academia in creating and nurturing such relationships, and roles for individual contributors/faculty, research organizations, academic leadership, and industry executives. This report represents a synthesis of these discussions.

The timing of this workshop coincides with a major disruption in the computing field. The rise of generative AI has upended higher education across the board: both what material to teach

¹ Sarkar, V., Amato, N., Davidson, S., de Sturler, E., Ebert, D., Hill, M. D., Isbell, C., Patel, S., Ramming, C., Srivastava, D., Theimer, M., & Zorn, B. (May 2020). *CRA Ad Hoc Industry/Academia Committee Report*. Computing Research Association.
<https://cra.org/industry/wp-content/uploads/sites/9/2022/06/CRA-Ad-Hoc-Industry-Academia-Committee-Report-May-2020.pdf>

² CRA-Industry. (June 2022). *Building Stronger Regional Academia-Industry-Government Computing Research Partnerships* [Roundtable].
<https://cra.org/crn/2022/06/building-stronger-regional-academia-industry-government-computing-research-partnerships/>

³ Bruce, E., Burns, R., Drane, T., Maher, M. L., Parashar, M., Srivastava, D., Taufer, M., & Wright, H. (April 2025). *Industry Engagement in Academic Research*. Computing Research Association.
<http://cra.org/wp-content/uploads/2025/04/industry-engagement-in-academic-research-April-2025.pdf>

and how to teach it. It raises questions about how to develop computing and problem-solving skills in undergraduate students, perceiving that how software will be developed will change rapidly in the coming years. Moreover, after over a decade of booming enrollments in computer science and related degrees, enrollment may be tapering off or declining, which will continue a trend of reduction in degree production. According to the 2024 Taulbee survey, bachelor's CS degree production declined by 6 percent in the U.S. as compared to 2023.⁴ Although there could be many causes for this decline, contributing factors include increased competition for jobs, and predictions that AI will replace software developers. At the same time, research funding is undergoing a significant change. If federal funding is reduced, will industry, along with states and foundations, make up the gap? Or will there just be less research output and lower PhD production in U.S. universities? How will these disruptive changes impact innovation in industry?

Clearly, this is a moment where partnerships between universities and industries are essential tools for robust workforce development and the expanding need for collaborative research. But in many organizations, the academia-industry relationship is a basic transactional one: academia trains students, and industry hires them. Instead, this report advocates for building long-term, trust-based relationships, where organizations are invested in each others' success. At the heart of such relationships are people and their knowledge and experience. The fluid exchange of people across organizations fosters sharing of ideas and leverages complementary strengths — academia's depth and exploratory mindset along with industry's scale and practical application. Sustainable relationships can be supported through a variety of models — ranging from sabbaticals and joint appointments to master research agreements and regionally-coordinated initiatives. With AI transforming the computing field, undergraduate and graduate curricula are being rethought so that every student has exposure to machine learning and ethical thinking. Strategic engagement with industry on this curriculum change ensures that students are exposed to real-world problems as part of their training. Moreover, academia can support industry in re-skilling and upskilling their employees, in programs ranging from certificates to professional degrees. In short, it is through strong partnerships that the positive impact of academia and industry working together can be realized.

The remainder of this report is organized into five core sections. We begin with a brief discussion of the workshop findings, highlighting both barriers to collaboration and common solutions. Subsequently, we discuss organizational structures that facilitate research collaboration. The third section focuses on education and workforce development. The fourth section provides a set of five recommendations, and we conclude with a discussion of next steps. We anticipate this report will be useful for faculty, administrators, and industry practitioners and leaders. The breadth of practices captured in the workshop reflects a growing recognition that no single solution fits all; instead, stakeholders must develop context-specific strategies that align with institutional missions and industry needs.

⁴ Computing Research Association. (2025). CRA Taulbee Survey. <https://cra.org/resources/taulbee-survey/>

WORKSHOP FINDINGS

This section provides a set of findings derived from presentations, panels, and breakout discussions, which will be addressed in the remainder of this report. We separate the findings into observations, barriers, and common solutions, and briefly discuss each finding.

Observations

1. *A critical aspect of teaching students new computing technologies, particularly AI, is to develop understanding of the technology's ethical implications.*

Workshop attendees frequently remarked on the importance of ethical training, both embedded within a variety of courses (e.g., specific intro course assignments) and as a standalone course. Research on AI requires interdisciplinary engagement to anticipate its societal implications; often, institutional support is needed to facilitate cross-organization collaboration.

2. *Academia is better at driving curriculum but industry input is crucial to keeping content aligned to real-world needs.*

With the rapid pace of change in industry, universities benefit from expertise and resources from their industry partners to enhance curriculum.

3. *Industry research needs vary based on their size and academia should develop better understanding and practices to match a variety of industries.*

Personalized relationships are the most valuable, but require adapting to needs. Attendees described a wide variety of academia-industry relationships, and many are supported by institutional agreements.

Barriers

4. *Cultural barriers and misconceptions between industry and universities must be understood better and overcome to increase collaboration.*

The focus on real-world problems and near-term goals in industry and the long-term vision of academic researchers is sometimes a barrier to meaningful conversations between industry and academia, but it is precisely this difference that makes collaboration impactful.

5. *The insufficient availability of cloud and GPU hardware access has been a barrier to university curriculum incorporating significant experience with cloud and AI development.*

With costs that can be over \$100,000 per course for cloud access, it is prohibitive for many universities to support extensive use of cloud development as part of their curriculum. Some university representatives noted that alternate cloud providers have different strengths, so that programs may not want to be locked into using a single cloud provider.

Common Solutions

6. *A proven approach to increasing university-industry engagement is the fluid movement of personnel (i.e., students, faculty, industrial practitioners and researchers) across organizations.*

Embedding personnel from one organization into another is an effective way to strengthen relationships. In addition to traditional mechanisms such as internships for students, many universities offer dual appointment opportunities for their faculty, which reciprocally are supported by industry with part-time positions.

7. *A variety of formal agreements and structures across high levels of organizations have facilitated research collaboration.*

Workshop attendees described a variety of agreements and structures developed by their organizations to support interaction, the topic of the next section.

MULTILEVEL STRATEGIES FOR ENHANCING RESEARCH COLLABORATION

Academia and industry bring distinct yet complementary strengths to the table. Academia excels in long-term thinking, cultivating talent pipelines, advancing cross-disciplinary research, and fostering academic freedom. In contrast, industry offers scale, a strong focus on practical problem-solving, access to vast computational resources, and massive amounts of data. When these strengths are effectively combined, they fuel a thriving technology community. However, achieving successful collaboration requires patience, transparency, and mutual respect.

The rise of artificial intelligence is driving a surge in startup activity — one of the larger waves in the history of tech entrepreneurship.⁵ This rapid growth is creating fresh opportunities for

⁵ Crunchbase News. (January 6, 2025). *Startup Funding Regained Its Footing in 2024 as AI Became the Star of the Show*. <https://news.crunchbase.com/venture/global-funding-data-analysis-ai-eoy-2024/>

collaboration and new models of engagement between academia and industry. While larger companies often operate with established research agendas and dedicated R&D teams, academia is uniquely positioned to work with startups and smaller companies to explore more flexible arrangements for faculty and student involvement in applied research.

Nevertheless, challenges remain. Aligning differing priorities and work cultures, navigating intellectual property and research ownership, and scaling partnerships across institutions all require careful planning and open communication. Overcoming these obstacles will be essential to fully realizing the potential of academic-industry collaboration in the AI era.

The workshop explored various approaches to strengthening research collaboration between academia and industry. These strategies target a wide range of stakeholders, including individual faculty members and researchers, research managers, program directors, department chairs, academic leaders such as school directors and college deans, and industry executives.

Individual Connectors: Initiating Industry Relationships

Faculty members and individual industry researchers often serve as key drivers in building relationships between academia and industry. One effective approach is the use of internal seed grants — funded by universities, government agencies, or industry partners — to help initiate these connections. The tech community thrives on people moving between academia and industry. Joint experiences, such as faculty and students spending time together at a company, can strengthen collaboration and give students valuable exposure to industry research. These also include sabbaticals in industry, dual appointments, and deferred hires where a new faculty member spends a year in industry before joining an academic department. A recent CRA-I report on Dual Appointments remarks that flexible longer term dual appointments is one way to improve faculty retention and provide means to collaborate with industry, especially large companies.⁶ Another effective strategy is for industry professionals to spend short stints at universities where they can be embedded in research groups. Hosting events where industry representatives are invited to learn about faculty and student research can also spark new partnerships and above mentioned embedded stints. Additionally, faculty participation on industry advisory boards in a scientific role can foster dialogue and help align research priorities between both sectors.

Departmental Leadership and Support

⁶ Brachman, R., Schooler, E., & Wright, H. (July 2025). *Evolving Trends in Dual Appointments Shaping the Future of Talent-Sharing Between Academia and Industry in Computer Science*. Computing Research Association. <https://cra.org/wp-content/uploads/2025/07/Evolving-Trends-in-Dual-Appointments-Report.pdf>

Department chairs, research managers, and program directors play a vital role in fostering and scaling research collaborations between academia and industry. These leaders can drive strategic matchmaking by aligning faculty expertise with industry needs, helping to create meaningful and impactful partnerships. Offering administrative support — particularly in managing and sustaining these relationships — can significantly reduce the burden on faculty and encourage participation. Another approach is for academic leaders to create opportunities for industry professionals to spend short sabbaticals at universities to foster research collaborations.

Many departments prioritize local engagement, as geographic proximity often increases the frequency and depth of collaboration. Building a strong departmental brand with local and regional industry partners enhances visibility and trust. This can be achieved through active involvement in regional economic initiatives, co-hosting events, and promoting successful collaborations.

Strong Industry Advisory Boards are also essential. These boards enable industry members to help shape departmental agendas and curricula. Best practices include allowing self-nomination with departmental approval, maintaining transparency around goals and performance metrics, and fostering two-way learning — where industry gains insight into emerging academic research and academia stays attuned to industry challenges and priorities.

Examples from successful industry-academic programs underscore the importance of sustained, selective partnerships built on shared interests and complementary capabilities.

Strategic Engagement at the University Level

Senior academic leaders — such as school directors, deans, and industry executives — play a critical role in addressing systemic barriers and aligning their institutions for successful collaboration. A unified, institution-wide strategy that bridges internal silos between research offices, corporate relations, and academic departments is key to fostering cross-pollination of ideas. These leaders should champion the development of flexible funding models that accommodate diverse partnership structures. Equally important is the creation of support systems at both the departmental and university levels to reduce friction in forming partnerships — particularly in areas like intellectual property, funding mechanisms, and research visibility.

Another essential mechanism is the implementation of streamlined master agreements, which help minimize administrative burden and enable faster, more consistent collaboration between faculty and industry partners.

Strengthening and Supporting Regional Innovation Ecosystems

Thriving regional innovation ecosystems are not only beneficial for the local communities but also essential for building resilience nationally — something that funding agencies have also explicitly highlighted for a long time. Universities can drive impact by partnering with local industry and organizations, building cross-sector alliances, and contributing to regional economic development. Supporting local industry and startups not only fosters innovation but also helps create vibrant, tech-enabled communities. Additionally, government policy support — through targeted programs, tax incentives, and strategic investments — is crucial for scaling these partnerships and sustaining long-term innovation. However, government funding is not a given — strong regional ecosystems not only can make the case to the government for funding but also might help fill gaps in federal and state funding.

In summary, effective research partnerships must demonstrate clear value for both sides — industry gains early access to innovative ideas and talent, while academia receives funding, real-world problems, and career opportunities for students.

FUTURE OF CS/AI EDUCATION AND WORKFORCE DEVELOPMENT

As previously highlighted, given profound disruptions to the computing field, there is a pressing need for partnerships between universities and industry. This section considers how computing programs can enhance student preparation, align types of programs to support industry practitioners, and develop partnerships that provide resources and other support for the education process.

Adapting the Content of Computing Programs

The first question to consider is to what extent the content of courses and degree programs should change. The 2023 ACM/IEEE-CS/AAAI Computer Science Curricula (CS-Curricula-23) recognized that computing programs, due to rapid growth and evolution of the discipline, must choose knowledge areas in which to focus to establish specific competency areas; moreover, what they call the Society, Ethics and Profession Knowledge Area has become an integral part of any curriculum.⁷ The workshop discussion aligned with these findings.

Workshop attendees identified concepts and skills relevant to industry that are not always represented in today's computing program core. A common theme was that graduates had inadequate experience with *DevOps*, a term that combines development with operations. Specifically, students had limited exposure to commercial cloud environments or experience

⁷ ACM/IEEE-CS/AAAI. (January 2024). *CS2023: The Final Report*. <https://csed.acm.org/final-report/>

using the cloud for development. There is always a tension between teaching the latest tools and establishing foundational knowledge that creates adaptive learners. However, at the foundations of cloud and DevOps are distributed and scalable computing concepts, which are often taught in advanced electives, but not part of the required curriculum. Moving these principles of system design into the core guides students to develop problem-solving skills at scale.

The recent emergence of generative AI demands a rethinking of how educational programs should develop students who use AI in their programming flow while understanding its limitations and implications. While AI literacy is essential, the majority of industry roles still rely on strong foundational CS skills; a blend of 20 percent AI and 80 percent core CS was suggested as an effective guideline for balancing instruction content. This suggests that all computing students should learn machine learning and AI as part of their formal education, but that it should not significantly displace core computer science. Computing programs should capitalize on their opportunity to influence the responsible use of AI in tools developed by industry practitioners. Programs should introduce ethical reasoning throughout the curriculum. Embedded ethics, where lectures and assignments in a range of courses have ethical learning outcomes, can be more impactful to reinforce ethical concepts, augmenting a core ethics course by applying it in context.

Many universities now offer concentrations in AI or machine learning within their existing computer science programs. While still relatively limited, there is a growing trend toward establishing standalone AI majors. These AI degrees vary widely in structure but often overlap significantly with computer science and data science programs, incorporating advanced topics such as machine learning, natural language processing, robotics, computer vision, and more. The CS-Curricula-23 report recommends integrating AI more broadly across undergraduate CS curricula, though formal guidance on creating AI majors may still be a few years away. At the graduate level, master's programs focused on AI and related fields are expanding rapidly. In contrast, the doctoral level has seen less structural change, as AI already comprises a substantial portion of computer science PhD research.

An underlying concern is that generative AI can solve many programming assignments if prompted with its specifications; students taking shortcuts in early classes may not be learning programming concepts, and new ways of teaching content or assessing learning outcomes may be required. In addition, the field and educational programs need to formalize instruction of the right way to employ AI to accelerate programmer productivity. What is popularly called *vibe coding*, where programmers express intent to an AI assistant in words and the tool produces executable code, will need to be formalized. Designing specifications and prompts, testing, formal methods, and other approaches to ensuring correctness will be essential skills in the use of AI-developed software, as discussed in the previously-noted CS-Curricula-23 report.

There is a need for students studying other fields to learn about AI, and computer science and related programs may be called upon to provide that training. A common mechanism that can

be provided by computing programs is AI minors or certificates, and exemplar AI minor programs have recently been established at a number of institutions. Another way to prepare students across disciplines combines domain-specific knowledge with AI and Computing literacy. AI+X may be a better model for the future than existing CS+X type models.

Computing and AI Education for Current and Future Industry Professionals

A second question to consider is how the types of programs should be adjusted to align with evolving industry needs and equip students for the future workforce. Here, we discuss a range of programs for undergraduate students, graduate training, and upskilling of non-matriculated learners.

Increasingly, industry partners wish to hire students who are job-ready and do not require significant training before they can make contributions. In addition to the previous discussion on teaching industry skills in courses, students with relevant job experience are particularly valuable. This requirement creates a conundrum — how can an entry-level candidate get experience? University-industry partnerships can simultaneously provide real-world experience for the students and industry exposure to emerging talent. To this end, internships, co-op programs, and industry engagement in capstone projects are common mechanisms. Further, students are highly motivated to hear from industry leaders; industry partners can influence students through visiting campus for professional development programs, mixers, and teaching modules in courses.

At the graduate level, a large number of professional master's and bridge programs were created to meet the demand for software developers over the past decade, including re-training students whose undergraduate training was in a different discipline. With the recent tighter job market, such programs must be repurposed for today's industry needs, with more emphasis on AI and machine learning. Such programs can utilize similar mechanisms as for undergraduate degrees to give students real-world experience, tracking changes in industry needs and rapidly responding with updates to curriculum.

Additional training suitable for industry practitioners should facilitate picking up skills without making a long-term commitment to a degree program. Certificate programs and access to individual courses for non-matriculated students are common ways universities support this training. Online or live-streamed courses, and courses or other specialized programs taught on-site for industry partners with large demand are minimally disruptive to daily work.

More Effective Scaling of Education

Industry's strength isn't in building curriculum. Academics are better story tellers for technical subjects but they need more input from industry. Massive online models of education have served an important purpose of demonstrating scale even though they have not been a replacement for in-person structured learning. An alternative approach may be possible with AI

helping academia increase their reach — collaboration with industry would be critical both for resources and relevance. Education and training approaches must evolve not just in content but in delivery — scaling access while maintaining rigor and relevance.

Partnerships for Scalable Resources

Industry and academia should be encouraged to co-develop cloud-based platforms and training tools, enabling access for students and faculty members to medium to large-scale AI experimentation without prohibitive costs. At the same time, smaller, efficient AI models can help train students on designing and applying resource-efficient models suitable for real-world constraints. Cloud credits (and access to AI hardware) is often a barrier and leads to graduates being less job-ready.

RECOMMENDATIONS

1. *Enhance research impact by combining academia's long-term vision with real-world problems informed by industry.*

Shared technical interests can transcend the typical transactional relationship arising from (a) universities producing students desiring jobs; and (b) industry needing trained employees. Research, sometimes over a long time horizon, produces innovative ideas that foreshadow future industry concerns and products. Accordingly, regional ecosystems that combine university research strengths with growing industries can provide engines of economic development and drive grassroots collaboration. Individual faculty embedded within industry inform their research by connecting with real-world problems; faculty members can leverage opportunities such as a gap year between PhD and starting a faculty position for new faculty, sabbaticals, consulting, and joint appointments to build relationships with industry. Similarly, industry researchers embedded within universities can leverage dual appointments, short-term sabbaticals, and (partially) relocating to university campuses with easy access to student researchers. Industry has large scale data and compute resources — access to this for academia is necessary for insight into real-world problems and will, in turn, benefit industry by having more prepared researchers and graduates. Moving beyond the natural communication barriers that arise between researchers and practitioners may require facilitation from university and industry leadership.

2. *Leverage the convening power of academic institutions to build partnerships with industry that benefit the broader community.*

Universities have an innate ability and a long history of being a nexus between industry, community, and government. Academic leaders should foster a culture of collaboration

with industry. For example, by promoting more independent industrial advisory boards, affiliate programs, university-wide research institutes.

Academic leaders should consider pursuing strategic matchmaking by aligning research focus areas with industry needs to increase the likelihood of impactful, long-term relationships. Faculty engagement can be further supported by allocating resources to help faculty navigate partnership logistics, intellectual property, and external communications. Hosting regular academia-industry summits will facilitate ongoing dialogue to address emerging challenges and realign priorities.

University leadership should Institutionalize relationship management by creating roles or offices dedicated to stewarding long-term industry engagements across the institution. A constant effort needs to be made to bridge the gap between research, corporate relations, and academic units to present a unified front to industry.

Finally, an innovative opportunity to foster free flow of interactions is to create master agreements to support more flexible models of collaboration beyond traditional ways with faculty going partially to industry (e.g. consulting, sabbatical, extended leaves) or industry sponsoring research in academia via grants or gifts. We urge academia to investigate alternatives where there is freer flow of resources between academia and industry with both sides getting a fair return on their investments.

3. *Accelerate workforce development through university programs, especially those supporting regional innovation ecosystems.*

Academia should consider more strategic alignment with local industry and startups to become an anchor in regional innovation ecosystems. While this has worked as a long term plan at many locations, some universities may need to create virtual ecosystems due to their location. Industry should invest in talent development by supporting university programs through fellowships, internships, curriculum input, and guest lecturing. Unique strategies such as industry funding the last year (or two) of a PhD student have been mutually beneficial. Academia and industry should work together to demonstrate the return on investment in education and research partnerships through job creation, innovation, and public good.

4. *Deliver industry-relevant curricula grounded in core computing principles to prepare adaptable learners, while also supporting upskilling and reskilling initiatives for the current workforce.*

Given the rapid pace of change in the field, computing courses and programs must be constantly revised to nurture students towards becoming successful industry professionals. There is an inherent tension between industry desiring universities to adopt new technologies in their curriculum, and universities desiring to focus on fundamental abstractions and core principles so that students are capable of learning technologies that emerge after their formal education. Ideally, universities and their industry partners should collaborate on curriculum and course development. At the granular level, university leaders might invite industry experts to co-design or teach modules, particularly in areas like AI, cloud computing, and ethics. More broadly, universities could invite industry partners to consult on new curriculum plans. To deliver upskilling programs that support industry professionals, alternate modalities may be desired, such as short courses, certificate programs, and interdisciplinary degrees tailored to workforce needs. For certain technologies, most notably AI and cloud computing, significant resources are required whose costs may be out of reach for academic institutions; industry partners and government support may be needed to mitigate this resource gap.

5. *Establish incentives and metrics to evaluate the impact of academia–industry collaboration.*

University leadership should promote ways of recognizing and rewarding faculty contributions to industry partnerships in promotion and tenure evaluations. We recommend developing metrics that capture the broader value of partnerships — such as student outcomes, startup creation, licenses and patents, and ecosystem development. These would help demonstrate the return on investment in education and research partnerships to the community at large.

NEXT STEPS

The breadth of practices highlighted in this report reinforces a core insight: successful academia–industry collaboration is not one-size-fits-all, but context-specific, evolving, and multi-dimensional. Institutions should evaluate their current engagement models and adopt flexible strategies that align with their mission, faculty strengths, while serving regional or national ecosystems. This includes formalizing roles to manage partnerships, expanding regional alliances, creating avenues for faculty and industry mobility, and enabling curriculum co-design in high-impact areas like AI and Cloud Computing. Shared investment in scalable infrastructure — such as cloud access and AI resources — will be essential, and universities must continue to develop workforce-aligned programs for both students and professionals.

Looking forward, a key priority is building durable mechanisms for collaboration, assessment, and adaptation. Institutions and national organizations should co-develop metrics that reflect

not only research output but also workforce readiness, innovation outcomes, and regional impact. Cross-sector dialogue must continue through convenings, shared research initiatives, and open dissemination of case studies and lessons learned. Importantly, policy and funding frameworks should evolve to support new models of partnership, recognizing that sustained academic–industry collaboration is vital to advancing education, research, and innovation in a time of profound technological and societal transformation.

ACKNOWLEDGEMENTS

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Participants

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