

# Industry Investment in Academic Research

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## Introduction

Collaboration between academia and industry plays a vital role in driving technological innovation and economic growth.<sup>1</sup> Academic research pushes the boundaries of knowledge, leading to breakthrough discoveries that industry can commercialize. By partnering with universities, companies gain early access to cutting-edge ideas and emerging technologies as well as talent, giving them a competitive edge in developing new products and services. This "pre-competitive" access allows for the seamless transfer of industry-inspired research into real-world applications, benefiting both academia and industry alike.

However, for these partnerships to be truly effective, they must go beyond a simple talent pipeline. A genuine two-way exchange of knowledge and expertise ensures that academia is not merely training students for industry but actively shaping the future of technology through collaborative research efforts. Applied industry research groups, student capstone projects, and other joint initiatives that address real-world industry challenges can lead to impactful innovations that integrate directly into company operations.

This joint whitepaper, developed by the Computing Research Association's (CRA) Industry Committee (CRA-I) and the Computing Community Consortium (CCC), highlights the importance of industry investment in academic research to foster a strong, reciprocal relationship. Strengthening these collaborations enables both sectors to advance knowledge, develop transformative technologies, and drive long-term success.

## Case Studies of Industry Investment in Academia

- **Advancing Interactive AI Through Industry-Academia Collaboration:** A large well known company and an equally large well known university partner on an initiative for

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<https://nap.nationalacademies.org/catalog/23393/continuing-innovation-in-information-technology-workshop-report>

interactive AI to conduct research into transformative technologies that define how humans interact with AI online and in the world. The program uses a competitive project selection process that builds teams that span both institutions, pairing industry researchers and developers with PhD students and faculty. The resulting projects demonstrate the bi-directional exchange of ideas and innovation and the sharing of resources and data, leveraging the strengths of both industry and academia.

- **Collaborative Funding Between Universities and National Labs:** University research groups often establish direct funding contracts with national labs, which operate very similar to industry. This investment provides student stipends, tuition support, and internship opportunities. The national labs work closely with faculty to train the students, creating a collaborative model where the labs benefit from the research expertise. At the same time, the university gains valuable real-world training and funding for its students. These partnerships create a robust path for recruiting students upon graduation, ensuring their readiness for careers in national labs and related research environments. This structured approach strengthens workforce development and facilitates seamless transitions from academia to national laboratory positions.
- **Strengthening University Ties to Sustain Satellite Offices and Drive Innovation:** As remote and hybrid work models evolve, companies are reassessing the need for satellite offices. Over time, these offices may lose relevance due to employee attrition, retirements, or underuse. Some are located near universities or were originally start-ups later acquired by larger companies, but their academic connections may have weakened. To keep these offices active and valuable, site leaders can strengthen ties with local universities by investing in research, supporting internship programs, and fostering industry-academia collaborations. These efforts help sustain the office, attract more businesses to the area, and create mutual benefits for both industry and academia, ultimately enriching the local community.
- **Industry-University Cooperative Research Centers Driving Pre-Competitive Innovation:** In the Industry Cooperative Research Center (IUCRCs) model, multiple companies contribute membership fees to fund pre-competitive research at universities. An industry advisory board then guides how the pooled funding is allocated to different research projects. This allows companies to explore and gain early access to ideas before they become commercialized products. Furthermore, this pre-competitive IUCRC research has led to successful spin-off projects and technologies that can then be directly incorporated into the industry partners' operations.
- **Industry-Funded Research Leading to In-House Innovation and Talent Acquisition:** A PhD student, supported by funding from a large financial company, took the initiative to develop a new product that enhanced the security of the company's enterprise software, something the company had not directly requested. After completing the PhD, the student was then hired by the company to build out and deploy the new product, which became an important internal tool. This demonstrates how industry investment in

academic research can lead to the creation of valuable innovations that get directly integrated into a company's operations.

## Benefits of Industry Investment in Academia

- Intellectual Exchange
  - It facilitates a two-way flow of knowledge, expertise, and insights between industry and academia.
  - It enables intellectual exchange that allows industry to inform academic research agendas and curriculum.
  - It exposes faculty and students to real-world challenges and applications.
  - Faculty collaborations and industry-sponsored labs foster direct exchange of technical knowledge.
- Accessing Innovative Research and Ideas
  - Academic research provides a cost-effective way for companies to explore high-risk, high-reward projects without fully bearing the costs.
  - Industry can gain early access to cutting-edge ideas and technologies.
  - Industry-University Cooperative Research Centers (IUCRCs) enable companies to pool funding and guide pre-competitive research at universities.
- Workforce and Talent Pipeline
  - Investing in academic research helps train the next generation of scientists, engineers, and technologists, ensuring a skilled workforce.
  - Industry collaboration exposes students to real-world problems, better preparing them for industry roles.
  - Complementing education with practical training - industry input can enhance the practical relevance of academic programs.
  - Dual appointment models allow students to simultaneously work on applied research projects at both the university and a company, providing unique access and experience.
- Strengthening Regional Economic Development
  - Industry-academia partnerships can drive innovation and economic growth in local/regional ecosystems.

## Recommendations for Effective Industry-Academia Partnerships

- Establish Long-Term Funding and Engagement Models
  - Consider multi-year funding agreements to support sustained research progress and deeper collaboration, rather than relying solely on short-term grants.

- Establish industry-funded faculty positions, endowed professorships, or research centers within universities to ensure long-term engagement in critical areas and allow companies to shape research agendas.
- Leverage models like Industry-University Cooperative Research Centers (IUCRCs), where multiple companies pool funding and guide the allocation of resources to pre-competitive research projects.
- Co-create company-sponsored labs on campus, fostering joint academic and industry participation and strengthening collaborative research efforts.
- Support academic conferences, workshops, and other research-driven events to facilitate knowledge exchange and partnership-building.
- Facilitate Student Internships and Joint Research Projects
  - Implement "dual appointment for students" or "acadustrial" models, where students hold positions at both an academic institution and an industry company. This ensures research remains aligned with industry needs while maintaining academic rigor. Students benefit from real-world data, industrial-strength tools, and academic oversight, fostering bidirectional knowledge transfer that brings cutting-edge research into industry applications.
  - Sponsor capstone design courses and extended student projects, providing industry challenge problems, real datasets, and employee mentorship to enhance the relevance and real-world applicability of academic work.
  - Expand internship and co-op programs, allowing students to gain hands-on experience and build professional networks across both academia and industry.
- Align Priorities and Expectations
  - Align research priorities to address industry needs and challenges, ensuring mutual benefits for both academia and companies.
  - Set clear expectations and deliverables upfront, ensuring all parties understand their roles, responsibilities, and goals.
  - Establish streamlined IP agreements with well-defined project milestones to facilitate smoother collaboration and the transfer of research outcomes.
  - Encourage industry professionals to serve as adjunct faculty, enabling companies to share expertise through direct engagement with students and researchers.
- Offer Alternative Degree Programs
  - The rigidity of PhD coursework and residency requirements often inhibits engineers in industry from pursuing research-oriented doctorate degrees. Universities should define flexible degree programs that align industry research with academic requirements, creating pathways for professionals to advance their careers while continuing to work in industry.
  - Companies can donate computing resources, datasets, and other infrastructure to support academic research and create environments where industry challenges inform university curricula.

- Strengthen Institutional and Community Investment
  - Making substantial naming gifts to fund campus buildings, facilities, and research programs can deepen long-term industry-academia relationships and create sustained impact.

## Conclusion

Effective industry investment in academic research can yield significant mutual benefits, from accelerating the transfer of innovative ideas into practice to developing a skilled, industry-ready workforce. However, realizing this potential requires carefully structuring the engagement models, aligning priorities, and fostering genuine intellectual exchange. Industry can pursue diverse approaches like multi-year funding agreements, industry-sponsored research centers, and collaborative programs that enable them to shape research agendas and directly engage students through internships and dual appointment programs.

These partnerships must facilitate a two-way exchange of knowledge. Industry can help shape academic curricula and support flexible degree pathways, while universities provide a cost-effective space for high-risk, high-reward research. By addressing challenges like intellectual property and roles, both sectors can build stronger, more sustainable collaborations. This will drive innovation, boost economic development, and train the next generation of technical leaders.