# Bridging the Engineering Talent Gap

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1. Introduction to the Gap in the workforce

The increasing demand for consumer electronics, IoT devices, and automotive systems have heightened the need for test professionals. Data from the SIA (Semiconductor Industry Association) and Oxford Economics shows the US faces a declining workforce with 1.4 million jobs at risk of going unfilled by 2030. Of these jobs 67100 are in the Semiconductor industry with 27300 requiring post secondary education. [1]

Semiconductor Industry (2023–2030 Job Gap)

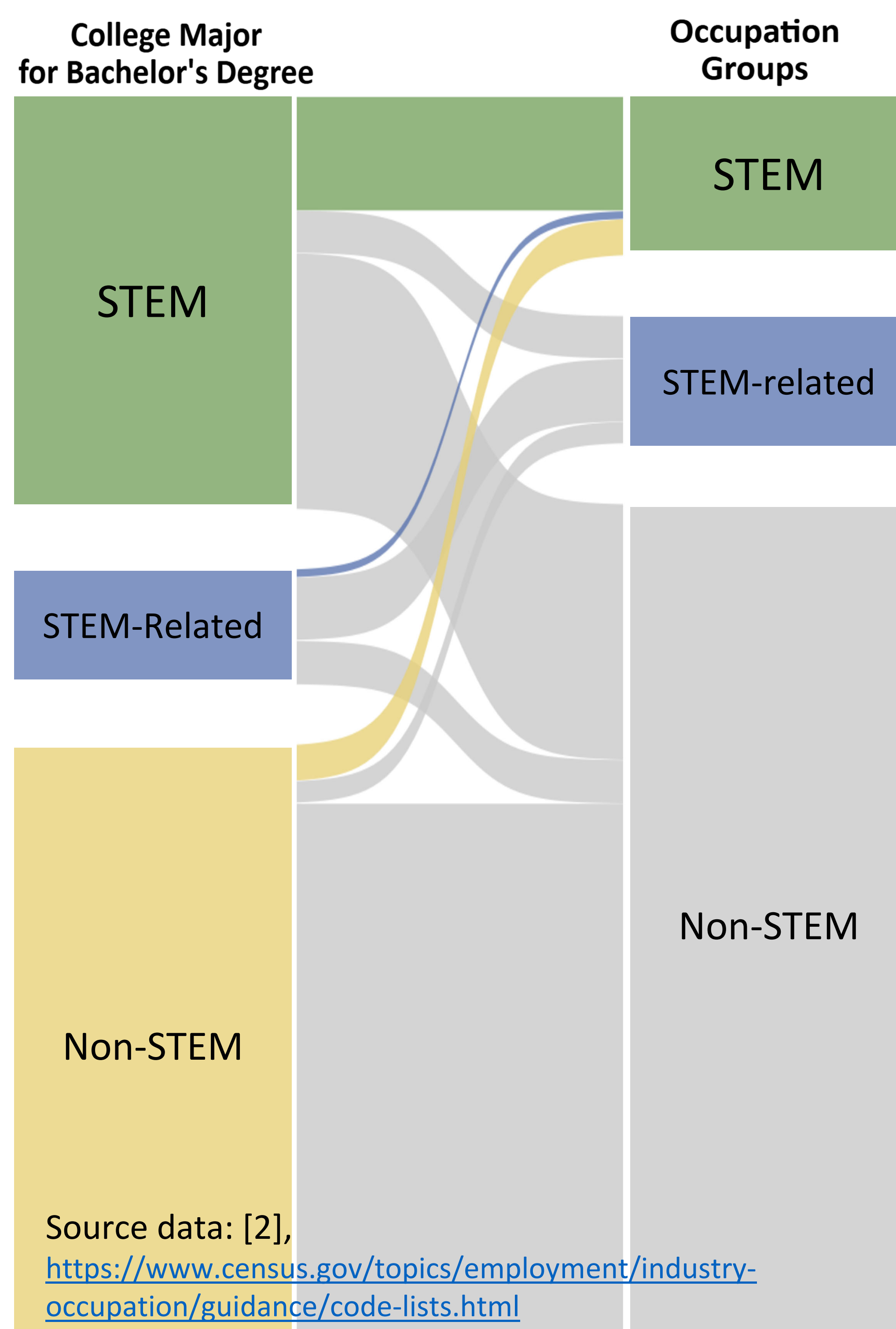Source data: [1] ■ Technicians ■ Computer Scientists ■ Bachelor's Degree ■ Master's Degree ■ PhD
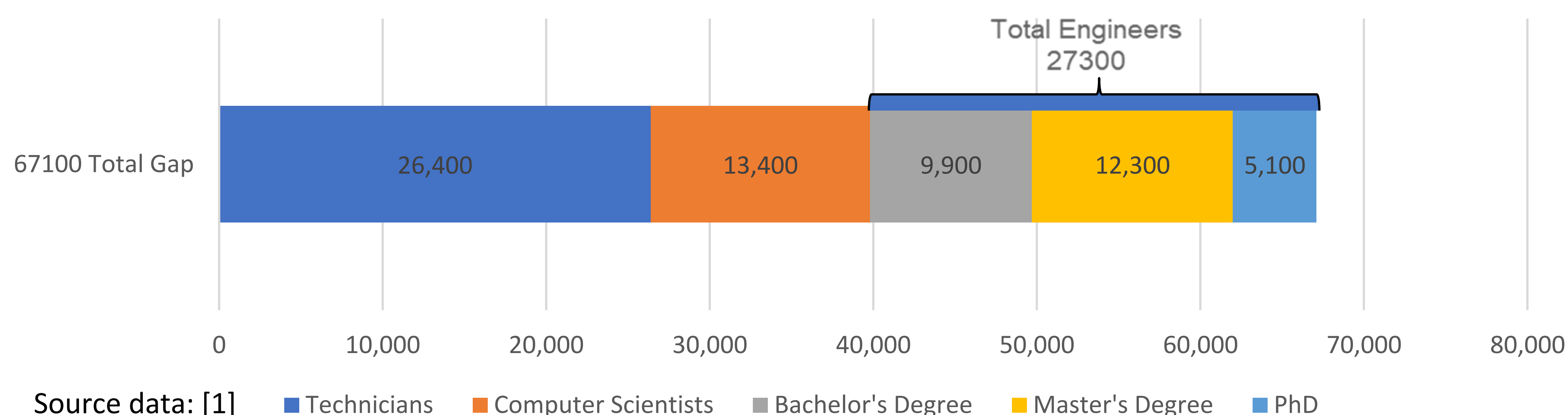
2. Untapped Potential & Challenges

A study conducted by US government census outlines a key challenge, **62% of STEM college graduates in the workforce are working in a Non-STEM occupation [2].**

- Key Challenge: Tap into underutilized pool of STEM candidates to fill gap for the test engineering industry
- Industry: Test and hardware engineering may be perceived as complex and less attractive
- Skillset: Hardware and test requires specialized tools and knowledge
- Education: STEM curriculum gives graduates familiarity with accessible software skills such as python or C/C++ but industry tools are less accessible

Majored in STEM: **36.6%** (+/- 0.1%)
Work in STEM: **14.0%** (+/- 0.1%)

College Major for Bachelor's Degree → Occupation Groups

Source data: [2],
https://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html

The limitation created by industry specific tools elevates the barrier to entry in gaining concrete experience on hardware engineering . Without these skills, new graduates may be pulled to other careers. This is highlighted be a behavioral study on new graduates by Cengage which found that nearly 2 in 5 graduates felt underqualified roles due to being unable to fulfill skills in the job description [3].

## 3. Proposed Strategies for test professionals

A multitude of strategies have been proposed to address the workforce gap in the semiconductor industry:

1. Strengthening support for regional partnerships to grow the workforce pipeline
2. Growing the pool of students pursuing STEM in Post Secondary Education,
3. Retaining existing professional workers through better company and management practices

Proposed Solutions

Regional Partnerships

STEM Student Pool

Retain existing Workforce

As test professionals, the most actionable steps lie in efforts that can be implemented directly within the industry, outside the constraints of domestic and international policy.

An area of focus should be cultivating partnerships within the industry.

- Collaborations between academia and industry such as internships.
- Skill development programs such as certification courses.
- Industry engagement events such as conferences or workshops.
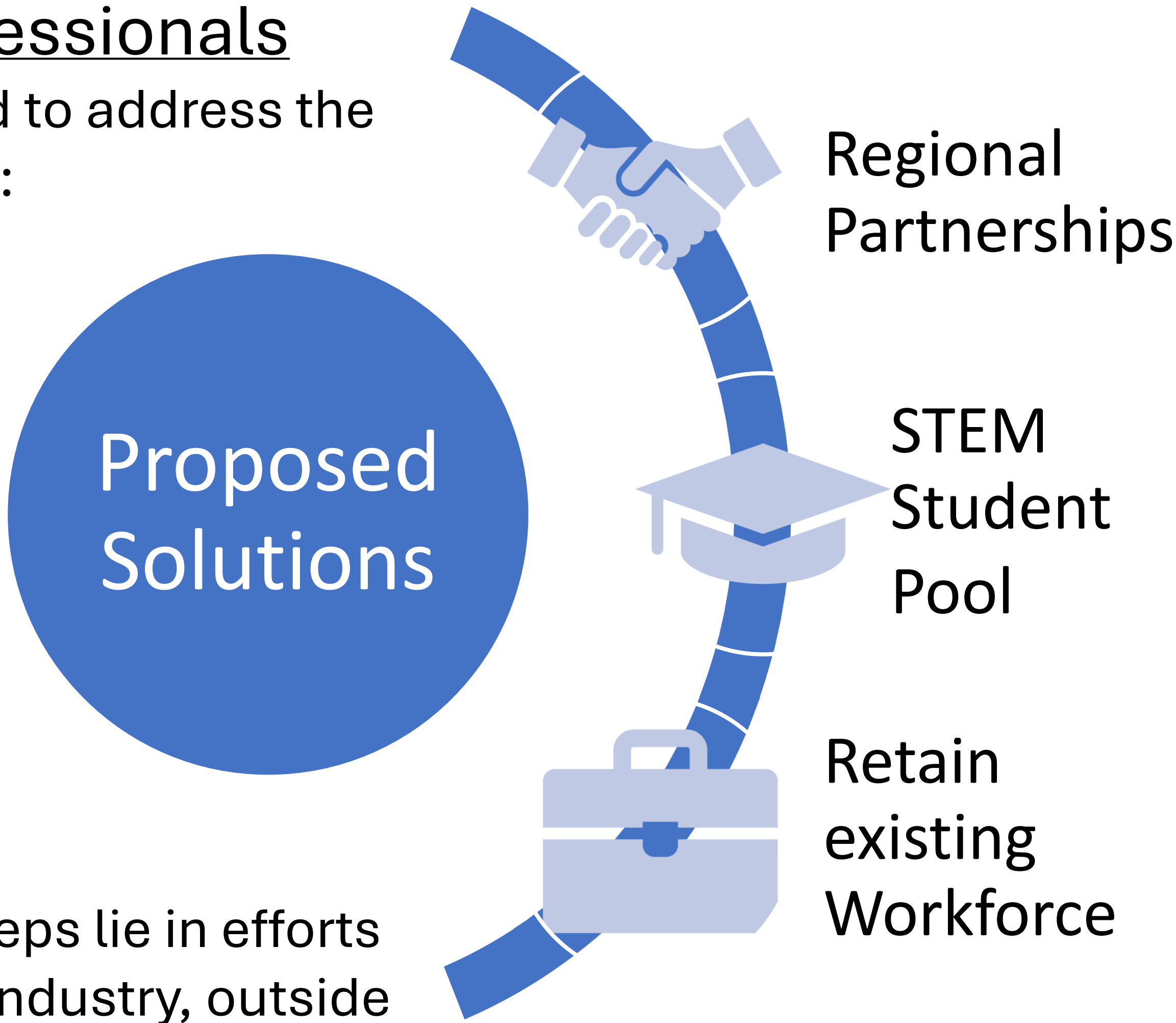
4. Successful Execution of Industry Partnership

The Maricopa County Community College District (MCCCD) introduced a semiconductor quick start program [4] focused on developing test professionals.

- Participation from local industry was crucial
- Instructors hired directly from a local fab brought experience and connections to the program
- Massive engagement with 87% of 689 completing the technical certificate with an additional 3000 prospective students awaiting enrollment.

MARICOPA COMMUNITY COLLEGES

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5. Partnering with an Educational Institution as a company in the Test Industry

Understanding the top value propositions students seek and addressing these concerns can elevate the attractiveness of the test industry to new graduates. A recent survey from ICIMS found the top concern for 2023 graduates is opportunities for growth at **44% of correspondents [5]** . An internship program is a method to appeal to the initial career path and development for potential applicants.

Engagement with Local Colleges:
- Partnered with SDSU to host career-building events.
- Provided pathways for students to gain industry experience through internships.

Impact of Internship Program

Skill Development:
- Access to advanced software and tools unavailable in academic settings.
- Opportunities to learn without the immediate pressure to deliver results.

Career Pathway:
- Internships bridged the gap between academic learning and industry applications.
- Exposure to real-world challenges and collaboration with professionals.

Opportunity and impact
- Ability to remain local while gaining practical experience in the semiconductor industry.
- Supportive to learn and envision career

Internships offer a clear pathway for companies to attract and develop talent by addressing key graduate concerns like skill development and career growth.

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6. Recommendation and Conclusion

There is no single strategy to address the workforce gap. However, as test professionals there are specific methods to help increase the pipeline of STEM students to the engineering industry. Exposure to test engineering through career fairs, industry events and college career planning events are all effective methods to increase the attractiveness of the industry. One strategy that has been shown to be successful is forming regional partnerships which provide the opportunity for students to gain mentorship, cultivate their skills and build relevant industry knowledge. This provides real world experience and helps overcome the challenges faced by STEM new grads.

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Works Cited
[1] Oxford Economics, *Chipping Away Report*, Semiconductor Industry Association (SIA), July 2023. [Online]. Available: https://www.oxford economics.com/wpcontent/uploads/2023/07/SIA_July2023_ChippingAway.pdf
[2] United States Census Bureau, *Does Majoring in STEM Lead to a STEM Job After Graduation?*, June 2021. [Online]. Available: https://www.census.gov/library/stories/2021/06/does-majoring-in-stem-lead-to-stem-job-after-graduation.html
[3] Cengage Group, *2023 Employability Survey Report*. [Online]. Available: https://cengage.widen.net/s/kwsvrrpz6z/cg-employability-survey-report
[4] Maricopa Corporate College, *Semiconductor Industry Information*. [Online]. Available: https://info.maricopacorporate.com/semiconductor
[5] ICIMS, *Class of 2023 Report*, 2023. [Online]. Available: https://www.icims.com/class-of-2023-report/

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