



Close the Engineering Skills Gap

***Prepare New Graduates to
Be Real-World Ready***



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***This summary is an abbreviated version of the report and does not contain the full content. A link to download the full report is available on the Tech-Clarity website, www.tech-clarity.com.**

If you have difficulty obtaining a copy of the report, please contact the author at michelle.boucher@tech-clarity.com.

Executive Overview

As globalization trends make it that much harder to stand out in today's competitive environment, companies must rely even more on innovation to engineer winning products that will stand out, capture market share, and secure future revenue streams.

Unfortunately, shortages in engineering talent with the right skills make this a challenge. A majority of companies (69%) project their engineering department will need to grow over the next five to ten years. Complicating this further, many of the engineers in the largest segment of the engineering workforce, those with over 20 years of experience, will approach retirement soon. As they leave the workforce, it will put even more pressure on hiring strategies to recruit new engineers.

80% of companies indicate that hiring the right engineers will be either highly or very critical to the future success of their business.

Tech-Clarity research finds that an overwhelming 80% of companies indicate that hiring the right engineers will be either highly or very critical to the future success of their business. Underscoring why it is so critical, 98% of companies report there will be a negative business impact if they can not find and hire the right engineers. These impacts range from loss of competitiveness, poor innovation, higher costs, to lost revenue. Unfortunately, the top challenge of managing the engineering workforce is finding engineering staff with the right skills. Part of the problem is due to the gap between the skills new engineering graduates have and what industry needs. This situation creates a sense of urgency to improve how engineers are prepared during their schooling so that we can close the skills gap.

To identify these gaps, Tech-Clarity conducted a global survey of 201 companies. Respondents represented companies of different sizes, across a wide variety of industries, and multiple geographic regions.

Most companies (75%) want students to be able to apply the technology to solve problems, not just know the “picks and clicks” of the software.

The results show that manufacturers have a clear preference for how to prepare engineering students for the real-world. They favor students with in-depth project experience involving multiple roles, complete lifecycle stages, and simulate a corporate environment. Schools that incorporate this type of experience into their engineering curriculum will have an advantage as there should be more demand for their graduates in the workforce.

Industry would like to see new graduates better prepared to use several skills. Engineering software is very prevalent on this list. This is largely because most companies (75%) want students to be able to apply the technology to solve problems, not just know the “picks and clicks” of the software.

The research also finds that industry needs to be more involved in academia to close the skills gap. Interestingly, companies report they are not as engaged as they expect others to be. To close the skills gap, engineering companies should at least double their current involvement with academia.

This report identifies the top skills that create the engineering skills gap. The report further explores the types of academic programs and experiences that provide students with the right skills they need to be successful in industry.

Recommendations

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations:

- Invest in your engineering staff to support growth and ensure you can recover from the loss of experienced staff to retirement
- Ensure you have the right mix of engineering talent to support the development of products that involve multiple engineering disciplines
- Hire from engineering programs that go beyond just learning theory and software menu picks, but provide opportunities to apply technology to solve problems
- Work with engineering schools to help them develop the curriculum that will develop the skills you would like to see in new hires
- Look at programs that offer students the opportunities to work on team-based projects, similar to the type of work they will do when employed
- Get involved in engineering programs to ensure enough industry exposure during schooling and develop an exceptional pool of talent to hire from

About the Author

Michelle Boucher is the Vice President of Research for Engineering Software for research firm Tech-Clarity. Michelle has spent over 20 years in various roles in engineering, marketing, management, and as an analyst. She has broad experience with topics such as product design, simulation, systems engineering, mechatronics, embedded systems, PCB design, improving product performance, process improvement, and mass customization. She graduated magna cum laude with an MBA from Babson College and earned a BS in Mechanical Engineering, with distinction, from Worcester



Polytechnic Institute.

Michelle began her career holding various roles as a mechanical engineer at Pratt & Whitney and KONA (now Synventive Molding Solutions). She then spent over ten years at PTC, a leading MCAD and PLM solution provider. While at PTC, she developed a deep understanding of end-user needs through roles in technical support, management, and product marketing. She worked in technical marketing at Moldflow Corporation (acquired by Autodesk), the market leader in injection molding simulation. Here she was instrumental in developing product positioning and go-to-market messages. Michelle then joined Aberdeen Group and covered product innovation, product development, and engineering processes, eventually running the Product Innovation and Engineering practice.

Michelle is an experienced researcher and author. She has benchmarked over 7000 product development professionals and published over 90 reports on product development best practices. She focuses on helping companies manage the complexity of today's products, markets, design environments, and value chains to achieve higher profitability.

About the Research

Tech-Clarity gathered and analyzed 201 responses to a web-based survey on engineering staffing, hiring, and required skills. Survey responses were collected by direct e-mail, social media, and online postings by Tech-Clarity. Tech-Clarity also interviewed leaders from leading manufacturers.

The respondents were comprised of almost one-half (46%) who were individual contributors. An additional 39% were manager or director level, and the remaining 15% included VP or executive levels.

The respondents represented a mix of company sizes, including 48% from smaller companies (less than \$100 million), 26% between \$100 million and \$1 billion, and 26% greater than \$1 billion. All company sizes were reported in US dollar equivalent.

The responding companies were a good representation of the manufacturing industries, including Machinery and Industrial (37%), Automotive (22%), Aerospace and Defense (22%), Energy, Process, & Utilities (18%), Life Sciences (16%), Consumer Products (14%), Hi-Tech and Electronics (11%) and others. Note that these numbers add up to greater than 100% because some companies indicated that they are active in more than one industry.

The respondents reported doing business globally, with most companies doing business in the North America (89%), 40% doing business in Western Europe, almost one-third doing business in the Asia-Pacific regions (29%), Latin America (13%), Eastern Europe (10%), Australia (9%) and Middle East (8%).

Responses from those determined not to be directly involved in developing or manufacturing products (including software vendors and consultants) were excluded from the analysis.

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