Manufacturing and Product Development

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Facilitator: Deidra Puentes
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Advisors

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David Aguirre, Maintenance & Engineering Manager, California Steel Industries
Dennis Galuszka, Senior Master Guitar Builder, Fender Musical Instruments Corporation
Jose Valdez, Interim Electrical Supervisor, Galvanizing & Pickle Line, California Steel Industries
Martin Torres, Electrical Supervisor, California Steel Industries
Omar Andrade, Paint Supervisor, Fender Musical Instruments Corporation
Wallace Brithinee, President of the Board, Manufacturers' Council of the Inland Empire

K12 Educational Participants

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Christopher Barta, Welding Instructor, Colton Redlands Yucaipa ROP
Christy Bong, K12 Pathway Coordinator, San Bernardino County ROP
Craig Steele, Facilities Worker, Colton Redlands Yucaipa ROP
Cynthia Clarke, Project and Activities Technician, San Bernardino County ROP
Daniel Hearon, Teacher/Mechatronics & STEAM, Colton Redlands Yucaipa ROP
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Melissa Shaw, Job Development Specialist, Riverside Unified
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Miguel Georgie, CTE educator, Cajon High
Nancy Guzma, PLTW Engineering Coordinator, Riverside Unified

Minutes

The Manufacturing and Product Development Advisory panel included industry representatives from advanced manufacturing, electrical systems, automation, custom fabrication, and product development. Panelists represented both highly automated production environments and craftsmanship-driven manufacturing settings, providing a comprehensive view of how technology and hands-on skill intersect within the industry. The following summarizes key discussion themes and recommendations shared during the advisory.

Question 1: What emerging trends and technologies do you believe will drive the most change in this industry over the next 3-5 years, and what should teachers and students focus on to stay ahead?

Jose Valdez: Explained that automation is one of the most significant emerging trends impacting manufacturing and electrical fields. He noted that many processes that were previously completed manually are now being automated to improve efficiency and reduce repetitive labor. As a result, future workforce needs will increasingly require knowledge of automation systems, programming, and operational controls. Jose emphasized that students should be exposed to automation-related coursework, including programming and system operations, to remain competitive in evolving industrial environments.

Martin Torres: Expanded on the role of automation by highlighting the importance of understanding its underlying components, including programming languages, process control systems, and computer-based operations. He explained that careers such as process control engineering will continue to grow as automation becomes more advanced. However, he emphasized that students must develop both technical and foundational skills, including mathematics, measurement, and reading comprehension, as these are essential for interpreting data, performing calculations, and working with electrical systems. He also noted that communication and documentation skills are critical, as technicians are required to maintain logs and reports in digital systems.

Dennis Galuszka: Offered a contrasting perspective by emphasizing that while automation and robotics are present in manufacturing, hands-on craftsmanship remains essential. He explained that even in highly automated environments, many processes still require manual skill, particularly when working with organic or variable materials such as wood. Dennis noted that there is currently a shortage of individuals with strong foundational skills such as woodworking, finishing, and hands-on problem-solving. He stressed that students should focus on developing basic technical skills, attention to detail, and the ability to physically manipulate materials, as these competencies cannot be fully replaced by automation.

Omar Andrade: Reinforced the importance of balancing automation with hands-on expertise, particularly in specialized manufacturing processes such as finishing and painting. He explained that while certain stages of production may be automated, many aspects, such as custom work and material-specific applications still rely heavily on manual skill and experiential knowledge.

He highlighted that understanding chemical reactions, timing, and environmental factors often comes from hands-on experience rather than programming alone. Omar emphasized that students who can bridge both worlds, automation and craftsmanship, will be especially valuable in the future workforce.

Dale Constuble: Emphasized the importance of maintaining foundational skills while also preparing for emerging technologies such as artificial intelligence and additive manufacturing. He explained that while technologies like 3D printing and AI are rapidly evolving and will significantly impact manufacturing processes, they should not replace the development of core skills. Dale shared that foundational experiences—such as manual machining, mathematical application, and hands-on building—create a deeper understanding of how systems function. He encouraged educators to create opportunities for students to build, create, and problem-solve, as these experiences foster creativity and long-term adaptability. He also noted that additive manufacturing technologies are advancing quickly and will likely play a larger role in production over the next several years.

Wallace Brithinee: Confirmed that automation and robotics are widely recognized as critical future workforce needs, particularly among small- and medium-sized manufacturers. However, he emphasized that foundational knowledge remains essential, especially in areas such as mathematics, measurement, and units of analysis. While many modern tools can perform complex calculations, workers must still understand the underlying concepts to verify accuracy and apply results appropriately. Wallace also highlighted the growing importance of understanding industry standards, quality management systems, and regulatory frameworks such as ANSI and Underwriters Laboratories. He noted that as manufacturing systems become more complex, employees will need to navigate both technical processes and compliance requirements. Additionally, he shared that ongoing regional efforts to support manufacturing modernization may provide further insight into evolving workforce skill needs.

Deidra Puentes, Facilitator: Synthesized the discussion by highlighting a consistent theme across panelists: while automation, robotics, and emerging technologies are transforming manufacturing, foundational skills remain critical. She noted that students must develop a baseline understanding of mathematics and technical concepts in order to effectively use digital tools and recognize errors. Overreliance on technology without foundational knowledge can lead to significant issues in production and problem-solving.

Question 2: How should our Career Technical Education (CTE) pathways adapt to ensure students are well-equipped to meet future demands and changes in this industry?

Wallace Brithinee: Explained that one area for improvement is stronger alignment between manufacturing workforce needs and educational investments. Drawing from his experience reviewing grant applications, he noted that manufacturing pathways are often underrepresented

in funding requests compared to sectors such as healthcare and hospitality. This suggests a disconnect between industry demand and how manufacturing programs are being prioritized or developed in schools. Wallace also emphasized that career pathways are not always linear, and many individuals enter manufacturing through varied experiences before finding engaging and meaningful work. He encouraged pathways to expose students to a wide range of career opportunities and entry points within the industry.

Deidra Puentes, Facilitator: Added that while schools face structural challenges such as facilities, funding, and grant limitations, industry partnerships are critical in shaping effective pathways. She emphasized that employers should actively collaborate with educators to communicate workforce needs and support pathway development, ensuring stronger alignment between instruction and hiring expectations.

David Aguirre: Highlighted that access to real-world learning experiences has fluctuated over time, particularly as liability concerns and district-level decisions reduced opportunities such as off-site training and facility visits. He noted that earlier models of hands-on exposure and industry-based learning were highly effective in helping students understand career pathways, and he is beginning to see a shift back toward those practices. David emphasized the importance of rebuilding those connections between schools and industry to provide students with authentic learning experiences that support career readiness.

Dennis Galuszka: Emphasized that one of the most important ways CTE pathways can adapt is by maintaining strong hands-on learning opportunities and providing meaningful alternatives to traditional college pathways. He explained that many students naturally gravitate toward working with their hands, even if they cannot yet define a specific career goal. Having access to these pathways allows students to develop confidence, purpose, and direction. Dennis stressed that the presence of these programs, and educators who support them, is essential for helping students discover their strengths and stay engaged in school.

Dale Constuble: Emphasized that pathways should prioritize early exposure, hands-on learning, and helping students understand how tools and technologies connect within real manufacturing processes. He explained that while advanced specialization may not be necessary at the high school level, students benefit from engaging with equipment, building projects, and seeing how different technologies work together to create a final product. Dale noted that without intentional curriculum design and teacher support, equipment such as 3D printers and fabrication tools may go underutilized. He encouraged pathways to focus on project-based learning that builds both technical skills and student engagement, while also incorporating industry exposure to help students identify career interests.

Martin Torres: Emphasized that pathways should be framed around clearly defined trades and foundational skills rather than broad or abstract industry labels that may be confusing to students and families. He explained that focusing on core trades such as electrical, welding, HVAC, or mechanics provides clearer direction and helps students understand career possibilities. Martin also highlighted the importance of preparing students for postsecondary technical education by teaching foundational learning habits, including reading ahead, taking

notes, and arriving prepared for instruction. He identified lack of preparation for learning as a common barrier for students entering technical training programs.

Audience Comments and Discussion: Audience members emphasized that increased access to industry environments is critical for helping students understand manufacturing careers. Participants noted that liability concerns, security restrictions, and limited facility access often prevent students from experiencing real-world workplaces, which creates a gap between classroom instruction and industry awareness. Additional comments reinforced that even highly advanced industries rely on foundational trade skills such as measurement, fabrication, and tool use. Overall, the discussion highlighted the importance of expanding industry exposure, strengthening partnerships, and clearly connecting foundational skills to real-world applications.

Question 3: What essential skills, educational qualifications, and certifications are currently required to gain employment in your industry, and how might these requirements change in the near future?

Dale Constuble: Emphasized that while formal education can be valuable, hiring decisions in manufacturing are often driven more by soft skills, adaptability, and team fit than by degrees or credentials alone. He explained that employees must be able to collaborate across disciplines such as machining, engineering, and electrical systems, making communication, humility, and the ability to work effectively with others essential. Dale noted that his organization prioritizes candidates who demonstrate leadership potential, openness to learning, and the ability to contribute positively to a team environment. He highlighted that technical skills can often be developed on the job, but strong interpersonal and collaborative skills are critical from the start.

David Aguirre: Emphasized that interpersonal communication skills are a significant area of need for new employees entering the workforce. He explained that younger employees often rely heavily on digital communication and may lack experience with direct, in-person interaction, which is still essential in many workplace settings. David highlighted the importance of teaching students to communicate proactively, seek out resources, and engage directly with colleagues to resolve problems. He also stressed the importance of foundational math skills, particularly up to algebra, noting that math supports logical thinking and problem-solving across a wide range of roles, from equipment operation to troubleshooting complex systems.

Jose Valdez: Reinforced the importance of mathematics in technical fields, particularly within electrical work. He explained that electricians must be able to apply math skills to ensure that components and systems are properly matched and installed. Without accurate calculations, equipment can fail or create unsafe conditions. Jose emphasized that math is not only foundational knowledge but a critical skill that directly impacts safety and performance in real-world applications.

Martin Torres: Expanded on the role of mathematics and technical knowledge, explaining that many trade careers require more advanced math than students may expect, including the use of formulas and calculations related to systems such as power distribution and electrical load. He noted that while certifications and training programs can support career readiness, they are not sufficient on their own if students cannot demonstrate their skills in real-world applications. Martin emphasized that employers often require hands-on assessments during the hiring process, where candidates must apply their skills under non-ideal conditions and adapt to real workplace challenges. He stressed that students must develop true competency and confidence in their abilities, as employers are ultimately evaluating whether they can perform tasks effectively rather than simply verifying credentials. While certifications may help students stand out, their value depends on the student's ability to apply skills independently and consistently in practice.

Dennis Galuszka: Emphasized that essential skills for employment often center on reliability, work ethic, and the ability to problem-solve rather than formal qualifications alone. He explained that in many manufacturing environments, employees are trained on specific tools and processes once hired, meaning prior experience is less important than a willingness to learn and show up consistently. Dennis highlighted the importance of what he described as "problem-solving mindset," where employees can assess a situation, think critically, and determine appropriate next steps. He noted that many technical skills, such as using measurement tools or specialized equipment, are developed through hands-on experience over time.

Omar Andrade: Emphasized the role of mentorship and on-the-job training in developing employee skills. He explained that individuals entering the workforce may come with varying levels of experience, but supervisors play a key role in helping them build both technical and interpersonal skills. Omar noted that understanding what motivates individuals and providing guidance can support long-term career development. He emphasized that while technical skills are important, employers often invest in developing those skills internally, reinforcing the importance of attitude, willingness to learn, and engagement in the workplace.

Wallace Brithinee: Discussed the role of certifications in manufacturing and noted that, while they are often emphasized within educational systems, they are not always a primary factor in hiring decisions. He explained that certifications may serve as an indicator of program completion, but they are often underrecognized within industry unless they are directly tied to job requirements, such as forklift operation or specific welding credentials. Wallace emphasized that increasing the value of certifications will require stronger alignment and communication between education and industry to ensure that credentials reflect meaningful, job-ready skills.

Question 4: What are a few occupations within the industry that do not require advanced degrees yet offer a living wage? Additionally, what advice would you give to a recent high school

graduate that would help them gain employment in your industry?

Dennis Galuszka: Explained that manufacturing offers a wide range of entry-level opportunities that do not require advanced degrees, including positions such as production workers, technicians, and forklift operators. He emphasized that many individuals are able to enter the industry and build long-term careers through experience and persistence. Dennis shared that advancement is highly possible, noting that leadership roles can be achieved over time through dedication and consistent performance. He encouraged recent graduates to focus on getting their foot in the door, working hard, and taking advantage of opportunities for growth. He also emphasized that employers invest in their employees and are often willing to provide support and training as individuals develop their skills over time.

David Aguirre: Emphasized that foundational employability skills are critical for gaining entry into the workforce. He explained that qualities such as a positive attitude, flexibility, and punctuality are often the determining factors in whether a candidate is hired and retained. David noted that while these expectations may seem simple, many applicants struggle to consistently demonstrate them. He encouraged recent graduates to focus on these core professional behaviors, as they are essential for establishing credibility and building opportunities for advancement within the industry.

Dale Constuble: Emphasized that passion and initiative are key factors that employers look for when hiring entry-level employees. He explained that individuals who demonstrate genuine interest in the work and take proactive steps, such as following up, asking questions, and showing eagerness to contribute, are more likely to stand out. Dale noted that many employees enter the industry through non-traditional paths, but those who demonstrate commitment and enthusiasm are often the ones who succeed. He encouraged recent graduates to actively express their interest in working within the trades and to remain persistent in pursuing opportunities.

Audience Questions

Audience Question 1: *Has diversity been a challenge within your industry, particularly in hiring more women and people of color? Additionally, what outreach efforts can educators support or have employers implemented to address this?*

Dennis Galuszka: Shared that diversity has not been a challenge within his organization, describing the workforce as a "melting pot" with a wide range of backgrounds represented. He indicated that hiring practices are inclusive and focused on bringing in individuals who are interested in the work, regardless of demographic background.

Dale Constuble: Echoed this perspective, noting that diversity has not been an issue within his organization. He reinforced that hiring is centered on finding individuals who are passionate about the work and a good fit for the team.

Wallace Brithinee: Provided a broader industry perspective, noting that some manufacturers may encounter diversity-related requirements through business partnerships rather than internal hiring challenges. He shared an example of a manufacturer supplying products to large retailers such as Costco and Walmart, where diversity-related data and reporting may be required as part of supplier agreements. He emphasized that while this may not reflect hiring challenges within organizations, it highlights how external expectations and partnerships can influence diversity-related practices in manufacturing.

Deidra Puentes, Facilitator: Clarified that in some cases, diversity considerations may be influenced by external requirements tied to partnerships or contracts, rather than internal hiring limitations. This distinction helped frame the discussion around both workplace practices and external accountability measures.

Audience Question 2: *How can education systems better align with industry needs, particularly in areas such as applied "shop math" and access to hands-on training environments like machine shops, to better prepare students for manufacturing careers?*

Audience Comment: An audience member shared concerns about the disconnect between Career Technical Education (CTE) and traditional academic systems, particularly in the area of mathematics instruction. They noted that efforts to introduce applied "shop math" courses, focused on real-world mathematical skills used in manufacturing, are often denied due to structural separation between academic and CTE pathways.

Additional concerns were raised regarding limitations within traditional education systems, particularly in mathematics instruction. One audience member explained that attempts to offer alternative math courses focused on foundational or applied skills were denied due to funding structures tied to traditional academic requirements. This reinforces the disconnect between what students need for workforce readiness and what is supported within existing systems.

The audience member also emphasized the need for expanded access to hands-on training environments, such as machine shops, where students can gain experience with equipment including lathes, CNC machines, and measurement tools. They expressed frustration with the difficulty of establishing these programs despite clear industry demand, noting that students often lack exposure to fundamental skills such as reading measurement tools (e.g., calipers), which are essential for employment. Overall, the comment highlighted a need for greater flexibility in curriculum design and stronger alignment between education systems and workforce expectations.

Dennis Galuszka: Reinforced the urgency of this issue by sharing that his organization is currently experiencing a shortage of machine shops capable of producing necessary parts. He explained that long-standing vendors have gone out of business, and remaining shops are either unavailable or operating at full capacity. Dennis emphasized that this reflects a broader industry gap, where there is significant demand for skilled machinists and machine shop operations, but not enough individuals or businesses entering the field. He noted that individuals with these skills could find immediate opportunities and strong earning potential, underscoring the importance of preparing students with hands-on manufacturing skills and exposure to machining pathways.

Audience Question 3: *How can schools expand access to hands-on industry experiences and better integrate academic and CTE instruction to prepare students for manufacturing careers?*

Audience Comment: Audience members expressed ongoing challenges in providing students with access to hands-on industry experiences, particularly when opportunities such as facility access, dual enrollment, or specialized training require additional time commitments outside the regular school day. Participants noted that while options like concurrent enrollment exist, many students are not willing or able to take on additional coursework beyond their full academic schedules. This creates barriers to providing meaningful exposure to industry-specific skills and environments.

Audience members also discussed the importance of integrating CTE and general education through collaborative, project-based learning. Examples included cross-curricular projects such as using manufacturing or welding activities to support math concepts or working with other departments to design and produce real-world items. While these efforts have shown success in some cases, participants noted that they are often inconsistent and not yet systematized. Overall, the discussion highlighted a need for stronger coordination between academic and CTE instruction, expanded access to industry experiences during the school day, and more flexible structures that support applied learning aligned to workforce needs.

Deidra Puentes, Facilitator: Reinforced the importance of co-curricular collaboration between CTE and general education teachers. She emphasized that integrating academic content into hands-on projects can help bridge gaps between traditional instruction and applied learning, while also supporting student engagement and skill development aligned to industry expectations.

Closing Panelist Comment

Wallace Brithinee: Shared concerns regarding the lack of available funding and support for small- and medium-sized manufacturing businesses seeking to modernize operations and address workforce challenges. He explained that despite applying for multiple state-supported grants focused on modernization and workforce development—often in partnership with higher education institutions—very few proposals were funded.

Wallace emphasized that small- and medium-sized manufacturers, which make up the vast majority of businesses in the region, often lack the resources and guidance needed to modernize equipment, improve processes, and scale operations. He noted that while there is strong interest from industry to partner with schools and support workforce development, limited access to funding and technical assistance creates barriers to both business growth and workforce alignment.

He highlighted that modernization efforts could help businesses expand capacity, adopt new technologies, and better meet industry demand; however, current funding opportunities are limited and highly competitive. Wallace expressed that without increased support, both industry advancement and workforce pipeline development may be constrained.

Cross-Panel Key Takeaways

These are the themes that appeared consistently across the full four questions AND the audience Q&A.

1. **Automation and advanced technologies are transforming manufacturing, but do not replace foundational skills.** Panelists consistently emphasized that while automation, robotics, artificial intelligence, and additive manufacturing are expanding across the industry, hands-on skills, craftsmanship, and foundational technical knowledge remain essential. Students must be able to work with both automated systems and physical materials.

2. **Foundational skills—including mathematics, problem-solving, and communication—are critical for workforce success.** Across all discussions, panelists highlighted the importance of core skills such as applied mathematics, measurement, reading comprehension, and technical communication. These skills support troubleshooting, system design, documentation, and decision-making in real-world manufacturing environments.

3. **Hands-on learning and real-world exposure are essential for preparing students for manufacturing careers.** Panelists and audience members emphasized that students need opportunities to build, create, and interact with tools, equipment, and industry environments. Without exposure to real-world applications, students struggle to understand career pathways and develop job-ready skills.

4. **There is a significant workforce gap in skilled trades, particularly in areas such as machining and advanced manufacturing.** Industry representatives highlighted an urgent need for skilled workers, especially in machine shop operations and technical trades. The decline of small shops and experienced workers has created immediate opportunities for individuals with relevant skills.

5. **Soft skills and professional behaviors are key factors in hiring and long-term success.** Employers consistently identified attitude, reliability, communication, adaptability, and teamwork as essential hiring criteria. These skills often outweigh formal education or certifications when determining candidate fit and advancement potential.

6. **Certifications alone are not sufficient without demonstrated competency.** While certifications can support career readiness, panelists emphasized that employers prioritize candidates who can demonstrate their skills in practical settings. Hands-on ability, problem-solving under real conditions, and adaptability are critical for employment.

7. **Clear and accessible career pathways are needed to help students and families understand manufacturing opportunities.** Panelists noted that students and families often lack awareness of manufacturing careers, particularly when pathways are described using broad or unfamiliar terminology. Clearly defined pathways connected to specific trades and career outcomes can improve engagement and decision-making.

8. **Stronger alignment between education systems and industry needs is necessary.** Audience and panel discussions highlighted disconnects between traditional academic structures and workforce preparation, including limitations in applied math instruction, access to equipment, and flexibility in program design. Greater collaboration between educators and industry partners is needed to address these gaps.

9. **Industry partnerships and exposure opportunities are critical but remain inconsistent.** Panelists and audience members emphasized the importance of facility tours, internships, and direct engagement with employers. However, barriers such as liability concerns, scheduling challenges, and limited access to industry sites continue to restrict these opportunities.

10. **Small- and medium-sized manufacturers require additional support to modernize and contribute to workforce development.** Panelists highlighted that many businesses lack access to funding and resources needed to modernize operations, scale production, and engage in workforce development efforts. Supporting these businesses is essential for strengthening both industry capacity and the talent pipeline.

Cross-Panel Action Items

These action items synthesize the most actionable guidance from the full advisory. These are the steps teachers can embed into coursework, lesson plans, or pathway design.

1. Increase hands-on, project-based learning aligned to real manufacturing processes.

- Design projects where students create tangible products using multiple tools and technologies such as fabrication, CNC, and finishing.
- Incorporate activities that require students to measure, assemble, troubleshoot, and refine work products.
- Ensure students regularly use tools such as calipers, measuring devices, and basic shop equipment.

2. Integrate applied mathematics into CTE instruction.

- Embed math concepts such as measurement, ratios, formulas, and basic algebra into technical lessons.
- Use real-world scenarios such as electrical calculations, material measurements, and load factors to reinforce application.
- Collaborate with math teachers to develop co-curricular or project-based lessons that connect academic and technical content.

3. Strengthen instruction in foundational technical and employability skills.

- Teach and reinforce reliability, punctuality, communication, and teamwork through daily classroom expectations.
- Incorporate opportunities for students to practice documentation, reporting, and technical reading.
- Provide structured activities that develop problem-solving and critical thinking in non-ideal conditions.

4. Expand exposure to manufacturing careers and industry environments.

- Organize facility tours, guest speakers, or virtual industry experiences to increase student awareness.
- Use videos, case studies, and real-world examples when in-person access is limited.
- Highlight a variety of entry-level roles and career pathways within manufacturing.

5. Develop clear, trade-based pathway messaging for students and families.

- Frame pathways around recognizable trades such as electrician, welder, or machinist rather than broad industry labels.
- Provide students with clear examples of career progression and earning potential.
- Share success stories and real-world examples to help students and families understand opportunities.

6. Create opportunities for students to demonstrate skills in real-world conditions.

- Incorporate performance-based assessments where students must apply skills under time constraints or imperfect conditions.

- Use industry-style evaluations such as practical exams or build challenges.
- Provide feedback focused on both technical accuracy and adaptability.

7. Strengthen partnerships with industry to support pathway development.

- Collaborate with local employers to identify skill needs and align curriculum accordingly.
- Invite industry partners to review student work, provide feedback, or participate in classroom activities.
- Work with employers to explore internship, mentorship, or work-based learning opportunities.

8. Advocate for increased access to equipment and modernized learning environments.

- Identify gaps in equipment or facilities needed to support manufacturing pathways.
- Work with district leadership and industry partners to pursue funding and resource opportunities.
- Ensure existing equipment is used intentionally through structured curriculum and teacher training.

9. Support early exposure and skill development in middle and high school.

- Introduce basic tool use, fabrication, and problem-solving activities at earlier grade levels.
- Provide exploratory experiences that allow students to discover interests before selecting a pathway.
- Reinforce foundational skills that prepare students for more advanced technical training.

10. Promote awareness of workforce demand and immediate career opportunities.

- Share labor market information highlighting shortages in areas such as machining and skilled trades.
- Discuss opportunities for entry-level employment that offer growth and living wages without advanced degrees.
- Encourage students to consider manufacturing as a viable and rewarding career pathway.

Key Takeaways and Action Items by Panelist

These key takeaways and action item lists highlight each respondent's insights, concerns, and suggested actions to address industry trends and to prepare students for the evolving landscape within their respective industries.

Dennis Galuszka, Senior Master Guitar Builder, Fender Musical Instruments Corporation

Key Takeaways:

- Hands-on skills and craftsmanship remain critical, even in highly automated environments.
- Students benefit from opportunities to build, create, and develop confidence through making.
- Many successful employees enter manufacturing through non-traditional pathways and grow through experience.
- There is a significant shortage of skilled machinists and machine shop operations, creating immediate workforce opportunities.

Action Items:

- Provide students with frequent hands-on opportunities to build and work with real materials.
- Expose students to machining and fabrication pathways, including measurement and tool use.
- Encourage students to explore entry-level opportunities and focus on gaining experience.
- Reinforce that persistence and work ethic can lead to long-term career growth.

David Aguirre, Maintenance & Engineering Manager, California Steel Industries

Key Takeaways:

- Interpersonal communication and direct engagement are essential workplace skills.
- Many students need support developing professional behaviors such as initiative and follow-through.
- Mathematics, particularly algebra, supports problem-solving and technical decision-making.
- Employability skills often determine hiring and advancement opportunities.

Action Items:

- Incorporate activities that require students to communicate in person and collaborate with peers.
- Teach students how to seek help, follow up, and engage proactively in problem-solving.
- Embed applied math into technical instruction to strengthen critical thinking.
- Reinforce workplace expectations such as punctuality, flexibility, and accountability.

Jose Valdez, Interim Electrical Supervisor, Galvanizing & Pickle Line, California Steel Industries

Key Takeaways:

- Mathematics is essential for ensuring safety and accuracy in electrical and technical work.
- Incorrect calculations can lead to equipment failure or unsafe conditions.
- Technical roles require precise application of foundational knowledge.

Action Items:

- Integrate math-based problem-solving into electrical and technical lessons.
- Provide students with scenarios that require calculating and verifying correct components.
- Emphasize the connection between math accuracy and workplace safety.

Martin Torres, Electrical Supervisor, California Steel Industries

Key Takeaways:

- Trade careers require stronger math skills than students often expect, including formulas and calculations.
- Students must be able to demonstrate skills in practical settings, not just earn certifications.
- Employers frequently assess candidates through hands-on evaluations.
- Preparation for learning, including reading and note-taking, is essential for success in technical training.

Action Items:

- Incorporate hands-on assessments that require students to demonstrate technical competency.
- Provide opportunities for students to practice applying skills under real-world conditions.
- Teach students how to prepare for instruction, including reviewing materials and taking notes.
- Help students understand the expectations of postsecondary technical training programs.

Omar Andrade, Paint Supervisor, Fender Musical Instruments Corporation

Key Takeaways:

- Mentorship and on-the-job training are critical for developing both technical and interpersonal skills.
- Employees enter the workforce with varying levels of experience and require guidance.
- Motivation and engagement play a significant role in long-term career development.

Action Items:

- Create mentorship opportunities within the classroom or through industry partnerships.
- Provide differentiated instruction to support students with varying skill levels.
- Encourage students to take ownership of their learning and career development.

Dale Constuble, Director of Manufacturing & Innovation, Garner Holt Productions

Key Takeaways:

- Passion, adaptability, and teamwork are key factors in hiring decisions.
- Students benefit from early exposure to tools, technologies, and real-world applications.
- Equipment alone is not sufficient; strong curriculum and project design are necessary.
- Students need opportunities to see how different technologies connect within a manufacturing process.

Action Items:

- Design integrated, project-based learning experiences that connect multiple tools and technologies.
- Provide students with opportunities to explore different areas of manufacturing.
- Focus on developing teamwork, leadership, and collaboration skills.
- Ensure equipment is used intentionally through structured projects and instruction.

Wallace Brithinee, President of the Board, Manufacturers' Council of the Inland Empire

Key Takeaways:

- Manufacturing pathways are often underrepresented in educational funding and program development.
- Certifications are not always a primary determining factor in hiring unless tied to specific job requirements.
- Small- and medium-sized manufacturers need additional support to modernize and grow.
- Career pathways into manufacturing are often non-linear and driven by interest and opportunity.

Action Items:

- Advocate for increased investment in manufacturing programs and equipment.
- Help students understand multiple entry points into manufacturing careers.
- Align certifications with meaningful, job-relevant skills and industry expectations.
- Strengthen connections between education, industry, and workforce development efforts.

Labor Market Information

The following labor market information was sourced from https://www.onetonline.org/ on February 12, 2026.

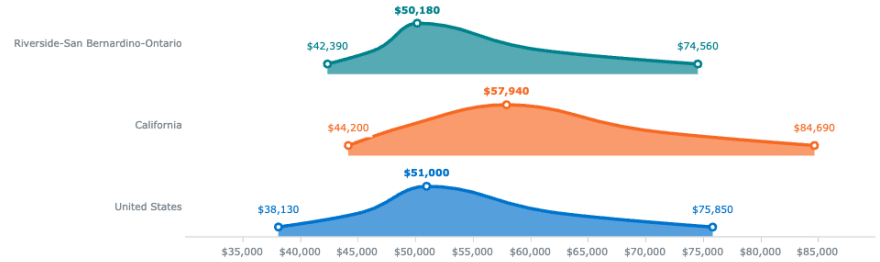
Local Wages

51-4121.00 - Welders, Cutters, Solderers, and Brazers

Wages for state: California Go

Wages near ZIP Code: 92408 Go

Annual Wages | Hourly Wages



In Riverside-San Bernardino-Ontario, CA:

- Workers on average earn **$50,180**.
- 10% of workers earn **$42,390 or less**.
- 10% of workers earn **$74,560 or more**.

In California:

- Workers on average earn **$57,940**.
- 10% of workers earn **$44,200 or less**.
- 10% of workers earn **$84,690 or more**.

In the United States:

- Workers on average earn **$51,000**.
- 10% of workers earn **$38,130 or less**.
- 10% of workers earn **$75,850 or more**.

Source: Bureau of Labor Statistics 2024 wage data.

California Employment Trends

51-4121.00 - Welders, Cutters, Solderers, and Brazers

View trends for state: California Go

In California:

Employment (2022)	29,600 employees
Projected employment (2032)	31,600 employees
Projected growth (2022-2032)	7%
Projected annual job openings (2022-2032)	3,150

In the United States:

Employment (2024)	457,300 employees
Projected employment (2034)	467,200 employees
Projected growth (2024-2034)	2% Slower than average
Projected annual job openings (2024-2034)	45,600

California source: Projections Central 2022-2032 long-term projections. United States source: Bureau of Labor Statistics 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period. "Projected annual job openings" represent openings due to growth and replacement.

Local Wages

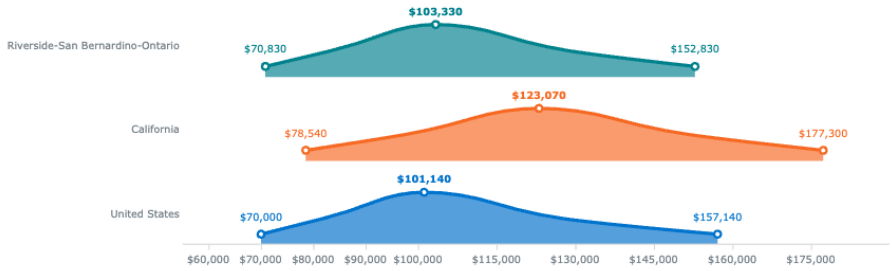
17-2112.03 - Manufacturing Engineers Bright Outlook

Wage data collected from **Industrial Engineers**.

Wages for state: California Go

Wages near ZIP Code: 92408 Go

Annual Wages | Hourly Wages



In Riverside-San Bernardino-Ontario, CA:

Wage data for **Industrial Engineers**.

- Workers on average earn **$103,330**.
- 10% of workers earn **$70,830 or less**.
- 10% of workers earn **$152,830 or more**.

In California:

Wage data for **Industrial Engineers**.

- Workers on average earn **$123,070**.
- 10% of workers earn **$78,540 or less**.
- 10% of workers earn **$177,300 or more**.

In the United States:

Wage data for **Industrial Engineers**.

- Workers on average earn **$101,140**.
- 10% of workers earn **$70,000 or less**.
- 10% of workers earn **$157,140 or more**.

Source: Bureau of Labor Statistics 2024 wage data.

California Employment Trends

17-2112.03 - Manufacturing Engineers Bright Outlook

View trends for state: California Go

In California:

Employment data for **Industrial Engineers**.

Employment (2022)	24,500 employees
Projected employment (2032)	28,300 employees
Projected growth (2022-2032)	16%
Projected annual job openings (2022-2032)	1,820

In the United States:

Employment data for **Industrial Engineers**.

Employment (2024)	351,100 employees
Projected employment (2034)	389,600 employees
Projected growth (2024-2034)	11% Much faster than average
Projected annual job openings (2024-2034)	25,200

California source: Projections Central 2022-2032 long-term projections. United States source: Bureau of Labor Statistics 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period. "Projected annual job openings" represent openings due to growth and replacement.

Local Wages

51-2022.00 - Electrical and Electronic Equipment Assemblers Bright Outlook

Wage data collected from **Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers**.

Wages for state: California Go

Wages near ZIP Code: 92408 Go

Annual Wages | Hourly Wages



In Riverside-San Bernardino-Ontario, CA:

Wage data for **Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers**.

- Workers on average earn **$38,360**.
- 10% of workers earn **$33,880 or less**.
- 10% of workers earn **$60,510 or more**.

In California:

Wage data for **Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers**.

- Workers on average earn **$46,720**.
- 10% of workers earn **$36,360 or less**.
- 10% of workers earn **$72,260 or more**.

In the United States:

Wage data for **Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers**.

- Workers on average earn **$44,040**.
- 10% of workers earn **$34,110 or less**.
- 10% of workers earn **$61,080 or more**.

Source: Bureau of Labor Statistics 2024 wage data.

California Employment Trends

51-2022.00 - Electrical and Electronic Equipment Assemblers Bright Outlook

View trends for state: California Go

In California:

Employment data for **Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers**.

Employment (2022)	40,600 employees
Projected employment (2032)	42,100 employees
Projected growth (2022-2032)	4%
Projected annual job openings (2022-2032)	4,510

In the United States:

Employment data for **Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers**.

Employment (2024)	261,400 employees
Projected employment (2034)	273,300 employees
Projected growth (2024-2034)	5% Faster than average
Projected annual job openings (2024-2034)	29,600

California source: Projections Central 2022-2032 long-term projections. United States source: Bureau of Labor Statistics 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period. "Projected annual job openings" represent openings due to growth and replacement.

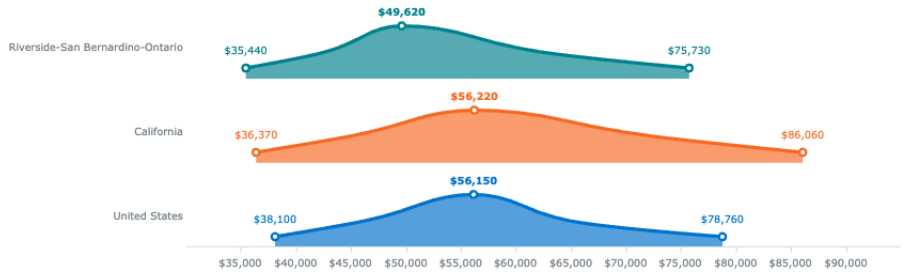
Local Wages

51-4041.00 - Machinists

Wages for state: California Go

Wages near ZIP Code: 92408 Go

Annual Wages | Hourly Wages



In Riverside-San Bernardino-Ontario, CA:

- Workers on average earn **$49,620**.
- 10% of workers earn **$35,440 or less**.
- 10% of workers earn **$75,730 or more**.

In California:

- Workers on average earn **$56,220**.
- 10% of workers earn **$36,370 or less**.
- 10% of workers earn **$86,060 or more**.

In the United States:

- Workers on average earn **$56,150**.
- 10% of workers earn **$38,100 or less**.
- 10% of workers earn **$78,760 or more**.

Source: Bureau of Labor Statistics 2024 wage data.

California Employment Trends

51-4041.00 - Machinists

View trends for state: California Go

In California:

Employment (2022)	20,800 employees
Projected employment (2032)	21,700 employees
Projected growth (2022-2032)	4%
Projected annual job openings (2022-2032)	2,140

In the United States:

Employment (2024)	299,500 employees
Projected employment (2034)	299,600 employees
Projected growth (2024-2034)	0% Little or no change
Projected annual job openings (2024-2034)	29,500

California source: Projections Central 2022-2032 long-term projections. United States source: Bureau of Labor Statistics 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period. "Projected annual job openings" represent openings due to growth and replacement.

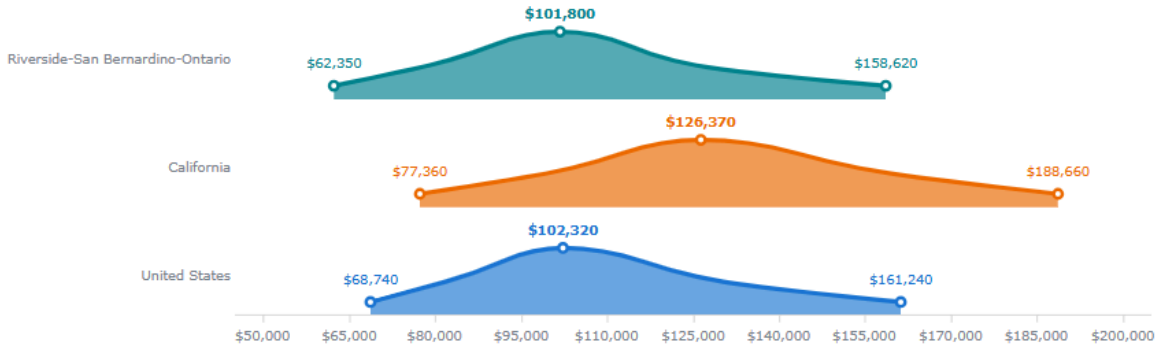
Local Wages

17-2141.00 - Mechanical Engineers Bright Outlook

Wages for state: California Go

Wages near ZIP Code: 92408 Go

Annual Wages | Hourly Wages



In Riverside-San Bernardino-Ontario, CA:

- Workers on average earn **$101,800**.
- 10% of workers earn **$62,350 or less**.
- 10% of workers earn **$158,620 or more**.

In California:

- Workers on average earn **$126,370**.
- 10% of workers earn **$77,360 or less**.
- 10% of workers earn **$188,660 or more**.

In the United States:

- Workers on average earn **$102,320**.
- 10% of workers earn **$68,740 or less**.
- 10% of workers earn **$161,240 or more**.

Source: Bureau of Labor Statistics 2024 wage data.

California Employment Trends

17-2141.00 - Mechanical Engineers Bright Outlook

View trends for state: California Go

In California:

Employment (2022)	27,700 employees
Projected employment (2032)	31,700 employees
Projected growth (2022-2032)	14%
Projected annual job openings (2022-2032)	2,020

In the United States:

Employment (2024)	293,100 employees
Projected employment (2034)	319,600 employees
Projected growth (2024-2034)	9% Much faster than average
Projected annual job openings (2024-2034)	18,100

California source: Projections Central 2022-2032 long-term projections. United States source: Bureau of Labor Statistics 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period. "Projected annual job openings" represent openings due to growth and replacement.

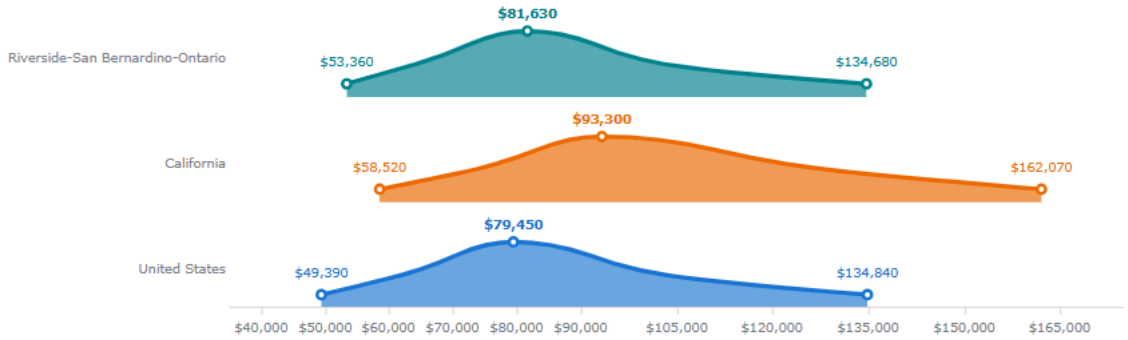
Local Wages

27-1021.00 - Commercial and Industrial Designers

Wages for state: California Go

Wages near ZIP Code: 92408 Go

Annual Wages | Hourly Wages



In Riverside-San Bernardino-Ontario, CA:

- Workers on average earn **$81,630**.
- 10% of workers earn **$53,360 or less**.
- 10% of workers earn **$134,680 or more**.

In California:

- Workers on average earn **$93,300**.
- 10% of workers earn **$58,520 or less**.
- 10% of workers earn **$162,070 or more**.

In the United States:

- Workers on average earn **$79,450**.
- 10% of workers earn **$49,390 or less**.
- 10% of workers earn **$134,840 or more**.

Source: Bureau of Labor Statistics 2024 wage data.

California Employment Trends

27-1021.00 - Commercial and Industrial Designers

View trends for state: California Go

In California:

Employment (2022)	5,300 employees
Projected employment (2032)	5,500 employees
Projected growth (2022-2032)	4%
Projected annual job openings (2022-2032)	380

In the United States:

Employment (2024)	30,600 employees
Projected employment (2034)	31,600 employees
Projected growth (2024-2034)	3% Average
Projected annual job openings (2024-2034)	2,500

California source: Projections Central 2022-2032 long-term projections. United States source: Bureau of Labor Statistics 2024-2034 employment projections. "Projected growth" represents the estimated change in total employment over the projections period. "Projected annual job openings" represent openings due to growth and replacement.