

# The Competitiveness Repository

## USA — AMTEC: Automotive Manufacturing Technical Education Collaborative

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Competitiveness is widely accepted as the key driver for sustaining prosperity and raising the well-being of the citizens of a country. Enhancing competitiveness is a long-term process that requires improvements across many areas and long-lasting commitments from relevant stakeholders to mobilize resources, time and effort. Accordingly, to make the right decisions, these stakeholders need information and data.

For more than 30 years, the World Economic Forum has studied and benchmarked competitiveness. From the outset, our goal has been to provide insight and stimulate discussion among all stakeholders on the best strategies, policies and activities to overcome the obstacles to improved competitiveness.

Against this backdrop, the Forum is taking the next step to inform the discussion on competitiveness practices among stakeholders by embarking on a project to build a **Competitiveness Repository** that compiles relevant information about practices that have aimed or are intended to build competitiveness. It will be complemented by a series of private events that provide a safe space for countries to better understand approaches that have worked elsewhere.

The platform will be built around a collection of practices collected through the completion of the template below. With this exercise, we seek to identify practices that:

- Had or are expected to have **system-wide impact**
- Are **scalable and potentially replicable** in other countries
- Have a **strong multistakeholder** component (they should rely on public-private collaboration and could include, for example, programmes and activities led or facilitated by government, but implemented or funded completely or partially by the private sector or civil society such as foundations, trust funds, etc.)

The practices collected will ideally follow the 12-pillar structure of the Global Competitiveness Index (GCI) Framework ([www.weforum.org/gcr](http://www.weforum.org/gcr)). They will include a variety of factors critical for competitiveness and offer a comprehensive tool to inform stakeholders about the different approaches for enhancing competitiveness in specific areas, as well as the key barriers to their implementation and factors that enabled change.

As well as reflecting the 12-pillar GCI structure, each of the practices will be structured along the following dimensions:

- A) **Background information about the practice**
- B) **Context and need for action**
- C) **Actions/activities adopted**
- D) **Role of the different stakeholders**
- E) **Results, lessons learned and additional information**

## A) Background information about the practice

**Title of the practice:** AMTEC: Automotive Manufacturing Technical Education Collaborative

**Country of practice:** USA

**Status (implemented, ongoing, planned):** Ongoing

**Public-private collaboration is/was key for success?** Yes

**A systematic evaluation was undertaken:** Yes

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CCRC serves as an evaluation partner, providing data and findings from surveys, interviews, site visits and college records that support programme development.

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**Related area of competitiveness:** Higher education and training

## B) Context and need for action

**What was the situation/challenge that resulted in a need for this competitiveness practice?**

**Shortage of skilled workers** – There is a growing gap between the skills and knowledge of the country's current and projected workforce in terms of the industries expected to grow most rapidly in the next decade.<sup>1</sup> At present, 34% of US manufacturing companies cannot find the employees with the right qualifications.<sup>2</sup> There is a growing need for multi-skilled workers with problem-solving skills in the automotive and manufacturing sector. More than 40% of job openings in the US economy in the next few years, according to the Council on Competitiveness, will be in the middle-skill area – requiring post-high school training, but not necessarily college.<sup>3</sup> Therefore, the current labour force is ill-equipped to fill this growing demand for skilled workers. This requires a renewed focus on improving vocational education to ensure a greater number of qualified individuals are channelled into a growing manufacturing sector.

## C) Actions/activities adopted

**What were/are the main activities/actions of the competitiveness practice?**

Toyota, the Japanese automaker, pioneered the process in the mid-2000s when it partnered with a Kentucky Community and Technical College System (KCTCS) to create a programme that taught advanced manufacturing skills to support a local plant. Upon realizing that the needs were more universal, it opened its facility and curriculum to competitors. The competitors ultimately realized this common interest and decided to work together to create collective competencies and credentials.

Another important innovation was in the high level of Toyota's involvement in the creation of the industry-wide curriculum. Toyota identified 170 distinct competencies, ranging from metric measurement conversion to replacing brakes and clutches. Teams of skilled technicians from a variety of companies evaluated these competencies, and narrowed the list down to 110. These were divided into 12 courses, and further broken down into 62 specialized modules to meet local training needs.<sup>4</sup>

AMTEC, based upon this model, is a joint programme of 30 community colleges and major automakers that operate in the United States to prepare students for careers in high-end auto-manufacturing skills. Skilled technicians from the companies involved developed a curriculum based on 110 common competencies. They also agreed on a standard set of evaluation metrics to create respected, transferable credentials. The consortium aims to build consensus on the skills standards needed by technicians, develop course/subject matter content and delivery systems, and share and disseminate promising practices, emphasizing the use of cutting-edge technologies. Students meet two days a week for in-class coursework and three days for hands-on training.<sup>5</sup>

During the planning phase, employers and community colleges convened at an AMTEC Academy, now held twice a year, to determine how to collaborate and identify key issues common to all employer partners, including career pathways and future workforce needs. In particular, the industry partners emphasized the need to fill shortages left by the retirement of highly skilled workers, along with training entry-level employees.

The Academies are designed to further develop relationships among the partners and address issues of importance to local economies. Each Academy involves a tour of the local plant to highlight the workplace applications of the skills being taught and stress the importance of involving both education and industry in the partnership. These events help bridge important language and cultural gaps between education and industry.<sup>6</sup>

## D) Role of the different stakeholders

**Which stakeholders have been involved (public sector, private sector, civil society, etc.) in the competitiveness practice?**

- **Public Sector:** Kentucky Community and Technical College System (grantee and fiscal agent), Alamo Community College, Cuyahoga Community College, Lansing Community College and Pellissippi College System provide the educational framework and classroom training.
- **Private Sector:** Ford Motor Company, General Motors Company, Toyota Motor Manufacturing and BMW are involved in design of curriculum and internships/on-the-job training (tools and machinery).
- **A policy board** ensures college-to-college collaboration and college-to-industry collaboration.
- **Civil society:** students attend and pay fees.

## E) Results, lessons learned and additional information

**Implementation date of the competitiveness practice (start date, end date/estimated end date)**

2009-ongoing

**What were/are the resource requirements (human and financial resources) of the activity?**

AMTEC received a \$5.5 million grant from the National Science Foundation in 2009 to become an Advanced Technological education (ATE) programme and scale up its partnerships.<sup>7</sup>

**What were the outcomes/results (expected or achieved) of the competitiveness practice in terms of quantitative (metrics) and qualitative results?**

AMTEC has grown from one programme in Kentucky to a multi-state, multi-company collaboration. As a National Center for Excellence in Automotive Manufacturing, it encompasses 30 colleges and 34 plants across 12 states.

In addition to assuring an adequate supply of skilled technicians, the programme seeks to facilitate the development, diffusion and adoption of knowledge and technology transfer.

Growing enrolment rates suggest an increased acceptance and rising profile of vocational education and the job prospects it can provide.

### What were the main barriers/challenges to implementing the practice and their effect on implementation? How were these barriers overcome?

- An underlying negative image of manufacturing as an industry, especially in terms of opportunities for employment
- Bias towards traditional four-year colleges
- Facilitating the participation of small manufacturers

### What have been the main enablers and their importance/relevance for the success of the practice implementation?

- **Presence and visibility** in secondary schools for recruitment (starting process early)
- **Cooperation** of industry associations to develop joint training programmes, with agreements to protect participants from talent poaching
- **Accountability** is another shared principle; the partners agreed on a standard set of metrics to assess student performance. As a result, the collaboration extends into the job market. The certificates or credentials acquired through AMTEC will be accepted across states and companies. "We now know what to expect when we get a resume from someone from an AMTEC curriculum, because it is a standardized curriculum," notes Joe Welgan, maintenance manager at Nissan's Smyrna, Tennessee plant. "It's a validation."<sup>8</sup>
- **Flexibility**: school two days per week and work three days for a hands-on experience

### What were the lessons learned from this activity?

AMTEC provides an example of federal investment in a broad partnership to support a major US industry. This practice also illustrates the importance of involving the private sector in the design of the curriculum. Toyota's involvement (and, later, other companies) was crucial to the success of AMTEC in building a skilled workforce and illustrating to students that there are viable alternatives to college.

Vocational training is possible at a large scale (due to intra-industry collaboration) and the model can be replicated/transferred to other sectors.

## Endnotes

- <sup>1</sup> US Department of Education, 2012
- <sup>2</sup> McKinsey On Society
- <sup>3</sup> Council on Competitiveness, 2009
- <sup>4</sup> McKinsey On Society
- <sup>5</sup> Lamos, 2010
- <sup>6</sup> Parker, 2011 Interview in US Department of Education, 2012
- <sup>7</sup> Zaragoza, 2010
- <sup>8</sup> McKinsey On Society

## References

- Council on Competitiveness, Bridging the Skills Gap. 2009. Available at [http://www.compete.org/images/uploads/File/PDF%20Files/Bridging\\_the\\_Skills\\_Gap.pdf](http://www.compete.org/images/uploads/File/PDF%20Files/Bridging_the_Skills_Gap.pdf)
- Lamos, Erin, et al. 2010. A Sharper Focus on Technical Workers: How to Educate and Train for the Global Economy. Washington DC: NGA Center for Best Practices.
- McKinsey On Society, Tackling Youth Unemployment, AMTEC. Available at: <http://www2.ed.gov/about/offices/list/ovae/pi/cclo/brief-4-employer-engagement.pdf>
- Zaragoza, Frederico. 2010. AMTEC Automobile Career Pathways: Mechatronics and Beyond [PowerPoint Slides]. ACTE: Presentations from 2010 Convention Sessions. Available at [http://www.acteonline.org/uploadedFiles/Convention\\_10/files/amtec12-2-10.ppt](http://www.acteonline.org/uploadedFiles/Convention_10/files/amtec12-2-10.ppt).

## Website/links if available and/or references to published material

<http://atecenters.org/amtec/>

<http://www.autoworkforce.org/>

<https://www.trainingindustry.com/workforce-development/articles/collaboration-between-community-colleges-and-automotive-companies-results-in-new-general-maintenance-mechatronics-curriculum.aspx>